

Classificazione IRG/SS

AARR **AARR - AIDS and Related Research**

Descrizione IRG:

The AIDS and AIDS-Related Research [AARR] Group reviews all - basic, translational, clinical, and behavioral – aspects of HIV/AIDS research. This includes studies of: the molecular and cell biology, immunology, pathogenesis, and epidemiology of HIV and related viruses, as well as AIDS-associated opportunistic infections; the development of drugs, vaccines, and other therapies; complications of therapy, as well as behavioral and social science approaches to preventing and evaluating the consequences of HIV/AIDS

AARR - ACE **AIDS Clinical Studies and Epidemiology - ACE**

Descrizione SS

The AIDS Clinical Studies and Epidemiology [ACE] Section reviews applications dealing with clinical and epidemiological aspects of HIV/AIDS

- AARR-ACE-0001 Natural history and Cohort studies, incidence and prevalence of AIDS and associated disorders.
- AARR-ACE-0002 Transmission of HIV infection in defined cohorts and prevention measures.
- AARR-ACE-0003 Clinical studies that address diagnosis and treatment of HIV/AIDS and associated complications.
- AARR-ACE-0004 Clinical studies that address mechanisms of HIV pathogenesis, and disease progression.
- AARR-ACE-0005 Metabolic and cardiovascular consequences of HAART in aging HIV/AIDS populations.
- AARR-ACE-0006 Hepatitis C virus in association with drug abuse/addiction in inner city populations.
- AARR-ACE-0007 TB and IRIS in Africa.
- AARR-ACE-0008 Mother to child transmission/prevention in Africa.
- AARR-ACE-0009 Development of clinical diagnostics in resource poor settings.
- AARR-ACE-0010 Development of biostatistical tools for AIDS clinical trials.
- AARR-ACE-0011 Mathematical modeling of viral infection, transmission, and disease progression.

AARR - ADDT **AIDS Discovery and Development of Therapeutics - ADDT**

Descrizione SS

The AIDS Discovery and Development of Therapeutics [ADDT] Section reviews applications on the design, discovery, and development of therapeutics for HIV and AIDS-related diseases. Proposed agents that inhibit the viral lifecycle may include conventional pharmacotherapies, natural products, gene-based strategies, and microbicides

- AARR-ADDT-0012 Development of targeted screens for new inhibitors of HIV/AIDS.
- AARR-ADDT-0013 Identification and characterization of natural products for prevention or therapy of HIV/AIDS.
- AARR-ADDT-0014 Pre-clinical development of drugs, formulations, and delivery vehicles for HIV/AIDS therapy.
- AARR-ADDT-0015 Design and development of gene-based therapies and vectors for HIV/AIDS.
- AARR-ADDT-0016 Mechanisms of drug action and viral drug resistance.
- AARR-ADDT-0017 Pharmacology of drugs and formulations for HIV/AIDS.
- AARR-ADDT-0018 Discovery and development of microbicides to prevent HIV transmission.
- AARR-ADDT-0019 Computational modeling and structure-assisted design of anti-HIV/AIDS agents.

AARR - AIP AIDS Immunology and Pathogenesis - AIP

Descrizione SS The AIDS Immunology and Pathogenesis [AIP] Section reviews applications on the host immune responses to and pathogenesis of the human immunodeficiency virus (HIV) and related retroviruses that cause immunodeficiencies including, but not limited to, simian immunodeficiency virus and feline immunodeficiency virus. This Section also reviews studies on sexual transmission and mother-to-child transmission of HIV

- AARR-AIP-0021 Innate, cellular, and humoral immune responses.
- AARR-AIP-0022 Immunological studies of transmission, initiation, and establishment of infection.
- AARR-AIP-0023 Mechanisms of host immune dysfunction.
- AARR-AIP-0024 Mechanisms of viral evasion of host immunity.
- AARR-AIP-0025 Viral and host determinants of HIV pathogenesis.
- AARR-AIP-0026 Animal models for HIV transmission, pathogenesis, and immunity.

AARR - AMCB AIDS Molecular and Cellular Biology - AMCB

Descrizione SS The AIDS Molecular and Cellular Biology [AMCB] Section reviews applications concerned with the molecular biology, cellular biology, structural biology, virology and genetics of HIV and related lentiviruses involving biochemical, pathophysiological and structural approaches. Emphasis is on molecular structure-function approaches to elucidating virus and host mechanisms of interaction and regulation

- AARR-AMCB-0027 Role of host gene products in virus infection and replication including HIV host restriction factor interactions.
- AARR-AMCB-0028 Mechanisms of viral evolution and fitness and mechanisms of host resistance with an emphasis on virus-host cell responses.
- AARR-AMCB-0029 Structure-function studies of virus and host gene products and their mechanisms of interaction.
- AARR-AMCB-0030 Molecular and biochemical mechanisms of virus entry, genome integration, proviral transcription, and viral particle assembly and release.
- AARR-AMCB-0031 Viral pathogenesis studies in animal models with an emphasis on non primate models

AARR - AOIC AIDS-Associated Opportunistic Infections and Cancer - AOIC

Descrizione SS The AIDS-associated Opportunistic Infections and Cancer [AOIC] Section reviews applications on opportunistic infections and cancers associated with HIV and AIDS. The science encompasses pathogenesis, immune responses, animal models, and molecular characterization of AIDS-associated opportunistic infections and cancers. Proposals should address opportunistic infections in the context of HIV infection/AIDS

- AARR-AOIC-0032 Molecular, cellular, and tissue-based studies of pathogenesis of AIDS-associated opportunistic infections, including viral pathogens, interactions among multiple pathogens and animal models of AIDS-associated opportunistic infections.
- AARR-AOIC-0033 Studies of HIV/AIDS-associated cancers, including animal models.
- AARR-AOIC-0034 Immunology of AIDS-associated opportunistic infections.
- AARR-AOIC-0035 Discovery/identification of therapeutic targets for AIDS-associated opportunistic infections

AARR - BSCH Behavioral and Social Consequences of HIV/AIDS - BSCH

Descrizione SS Behavioral and Social Consequences of HIV/AIDS [BSCH] Section reviews studies of behavioral and psychosocial aspects of HIV infection, the effectiveness of interventions, the consequences of infection, and the effects of HIV infection and AIDS on the individual, family, and community. In addition, it reviews health services and other social science research of psychosocial factors of HIV disease.

- AARR-BSCH-0036 Effectiveness of intervention strategies to reduce HIV risk behaviors; interventions to prevent social stigmatization of children and adults; caregiving and family-based studies.
- AARR-BSCH-0037 Effects of HIV infection and AIDS on behavioral, cognitive, and social functioning; depression and other psychiatric disorders, and substance abuse; quality of life; educational products and programs.
- AARR-BSCH-0038 Behavioral and social aspects of recruitment, retention, and adherence; qualitative and quantitative assessment of behavioral and social factors associated with HIV infection and disease progression.
- AARR-BSCH-0039 Health services, including caregiving, access, utilization, linkage, cost effectiveness, and economics

AARR - *BSPH* Behavioral and Social Science Approaches to Preventing HIV/AIDS - BSPH

Descrizione SS The Behavioral and Social Science Approaches to Preventing HIV/AIDS [BSPH] Section reviews studies of risk factors and antecedents of HIV infection as well as basic behavioral, epidemiologic, and social science studies of mechanisms and factors at the individual and community levels

- AARR-BSPH-0040 Development and testing of interventions to reduce HIV/AIDS risk behaviors.
- AARR-BSPH-0041 Epidemiological and ethnographic studies of HIV risk among the seriously mentally ill and other vulnerable populations, such as the homeless, prisoners, and chronic substance abusers.
- AARR-BSPH-0042 Multidisciplinary studies of epidemiology and/or interventions with predominantly behavioral/psychological outcomes as well as some standard biological outcomes.
- AARR-BSPH-0043 Studies to increase Recruitment, retention, and adherence in clinical/cohort settings

AARR - *NAED* NeuroAIDS and other End-organ Diseases - NAED

Descrizione SS The NAED Section reviews applications on the effects of HIV/AIDS on the nervous system and other organs systems, as well as the biological effects of drug abuse in the context of HIV/AIDS. Emphasis is on the basic biological and mechanistic studies, rather than clinical aspects.

- AARR-NAED-0044 Neurovirology, neuroimmunology, neuroendocrinology, behavioral immunology, and neuroimaging related to pathogenesis of HIV (and related retroviruses).
- AARR-NAED-0045 Cell and molecular biology of HIV in CNS and other non-lymphoid organ systems.
- AARR-NAED-0046 Physiology and cell biology of cytokine-hormonal interactions in CNS and other end-organ disease in AIDS.
- AARR-NAED-0047 Studies of effects of used and abused substances and neuroactive drugs on establishment of infection, immunopathogenesis, neuropathogenesis, and HIV disease progression.
- AARR-NAED-0048 Studies of HIV-induced cardiomyopathy, renal disease, pulmonary dysfunction and other end-organ pathology

AARR - *SBAR* AARR Small Business

Descrizione SS The Small Business Innovation Research (SBIR) and Small Business Technology Transfer Research (STTR) in AIDS and AIDS-Related Research [SBAR] section review small business applications including Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] grant applications concerned with biological sciences, vaccine research, and social/behavioral sciences in the area of HIV/AIDS. The small business applications dealing with HIV vaccine research are reviewed in the HIV/AIDS Vaccines Section (VACC)

- AARR-SBAR-0055 The AIDS and AIDS-Related Research Small Business Activities review small business applications including Small Business Innovation Research - SBIR and Small Business Technology Transfer - STTR grant application in AARR field

Descrizione SS

The HIV/AIDS Vaccines [VACC] Section reviews applications concerned with all aspects of development of vaccines against HIV and related retroviruses.

- AARR-VACC-0049 Identification of potential vaccine epitopes or immunogens.
- AARR-VACC-0050 Design and development of different types of candidate immunogens.
- AARR-VACC-0051 Delivery and formulation approaches, including use of live attenuated vectors and novel adjuvants, to target specific immune responses or augment immunogenicity.
- AARR-VACC-0052 New and improved methodologies to assess vaccine-induced immune responses, including the development or improvement of animal models for vaccine testing.
- AARR-VACC-0053 Assessment of safety, efficacy and correlates of protection of candidate vaccines in animal models and humans.

BBBP**BBBP - Biobehavioral and Behavioral Processes****Descrizione IRG:**

The Biobehavioral and Behavioral Processes [BBBP] Group considers applications on biobehavioral and behavioral processes across the lifespan. Research on non-human animals as well as humans is included, and both normal and disordered processes are addressed. While the focus is on behavior, studies may also consider related central, autonomic, neuroendocrine, immune, neural, hormonal, motor, and genetic issues. Neuroimaging and molecular and/or behavioral genetic approaches may be employed.

BBBP - APDA**Adult Psychopathology and Disorders of Aging - APDA****Descrizione SS**

The Adult Psychopathology and Disorders of Aging Section focuses on psychopathology and behavioral, cognitive and emotional disorders in adults. Behavioral, cognitive, socioemotional, neurobiological, behavioral and molecular genetic, and neuroimaging approaches are examined. Emphasis is on human studies of etiology, diagnosis, phenotypic description, comorbidity, and intervention in adult disorders, such as schizophrenia, mood disorders, regulation disorders, personality disorders, Alzheimer's disease, traumatic brain injury, and sleep disorders

- BBBP-APDA-0056 Adult Psychopathology: Diagnosis, etiology, comorbidity, clinical course and outcomes in mental health disorders of adulthood, including schizophrenia, mood and anxiety disorders, post-traumatic stress disorder, eating disorders, sleep disorders, substance use disorders, and personality disorders.
- BBBP-APDA-0057 Disorders of Aging: Diagnosis, etiology, comorbidity, and course in deficits and disorders associated with aging, including dementia; mild cognitive impairment, Parkinson's disease, and Alzheimer's disease.
- BBBP-APDA-0058 Etiology and Mechanisms: Biological, genetic and neural factors underlying aging disorders and adult psychopathology. Included are molecular genetic and behavioral genetic studies, neuropathological studies, neurochemical and neuroimaging studies with emphasis on the relationship between these factors and clinical or functional profile over time.
- BBBP-APDA-0059 Acquired Disorders: Disorders affecting behavioral outcome including studies of acquired deficits and disorders due to traumatic brain injury or substance abuse.
- BBBP-APDA-0060 Intervention studies: Research addressing identification, treatment and/or rehabilitation methods for adults with psychopathology or disorders of aging.

Descrizione SS

The Biobehavioral Regulation, Learning and Ethology Section [BRLE] reviews applications concerned with basic biobehavioral processes and adaptation across the lifespan [infancy through old age]. The Section primarily considers research with non-human animals [vertebrates and invertebrates] but relevant work with humans is also included. Normal and disordered processes are addressed. Although the focus is on behavior, studies may also consider related neural, hormonal, and genetic factors. Methods include [but are not limited to] behavioral experiments, naturalistic observation; hormonal, genetic, molecular, surgical and pharmacologic interventions; and computational modeling.

- BBBP-BRLE-0061 Learning, cognition, and behavioral control: Classical and operant conditioning; sensitization and habituation; choice; observational and social learning; sensory, perceptual, spatial, motor, and navigational abilities; timing, counting and other quantitative abilities; attention; memory; categorization; problem-solving; executive function; regulatory function.
- BBBP-BRLE-0062 Behavioral mechanisms of substance abuse: Preferences and aversions; craving; tolerance and sensitization; discriminative and reinforcing effects of abused substances; subjective, sensory, perceptual, and performance effects; vulnerabilities to dependence; social influences; learning-theoretic and behavioral economic approaches.
- BBBP-BRLE-0063 Animal models of psychopathology and treatment: Processes underlying disordered behavior, including fear, depression, mania, violence, regulatory dysfunction, cognitive dysfunction, behavioral [dis]inhibition; genetic, biological, and social influences on development of pathology; behavioral interventions; behavioral aspects of psychopharmacologic interventions.
- BBBP-BRLE-0064 Social behavior and communication: Social organization; attachment, affiliation, mate choice and parent-offspring interaction; dominance, aggression and peacemaking; socialization; play; organization and function of communication processes.
- BBBP-BRLE-0065 Behavioral development: Perceptual, motor, and cognitive development; social and communicative development; sexual and reproductive development; development of behavioral control; prenatal influences; behavioral teratology; behavior genetics.
- BBBP-BRLE-0066 Regulatory and homeostatic processes: Feeding, drinking and other ingestive behaviors; sexual and reproductive behaviors; sleep and wakefulness; thermo-regulation; biological rhythms and cycles; activity levels; related perceptual, motivational, and action systems; behavioral and social influences on hormone action and gene expression.
- BBBP-BRLE-0067 Studies of basic learning principles and pharmacology applied to self- injurious behavior may also be assigned here.

Descrizione SS

The Cognition and Perception Section reviews applications investigating normal and disordered cognition and perception and their development across the lifespan [infancy through old age], involving behavioral, neuroimaging, psychophysiological, neuropsychological, and mathematical/computational modeling approaches.

- BBBP-CP-0068 Perception: higher order perceptual mechanisms for all sensory modalities; object and scene recognition; processing of spatial and temporal relations; complex auditory events; intermodal perception
- BBBP-CP-0069 Attention: attentional control and allocation; capacity and resource limitations; automatization
- BBBP-CP-0070 Executive Function: planning and monitoring of complex behaviors; coordination of cognitive operations; consciousness
- BBBP-CP-0071 Learning, Memory, and Knowledge: Encoding, consolidation, and retrieval processes; short-term, working, and long-term memory; episodic/semantic, declarative/procedural, explicit/implicit and other types of memory and their interactions; categorization; expert knowledge; skill learning; rule induction; roles of instruction and practice
- BBBP-CP-0072 Reasoning, Decision Making, and Problem Solving: use of rules, models, strategies, and heuristics; deductive and inductive reasoning; mathematical and statistical reasoning; analogical reasoning; choice behavior; creativity
- BBBP-CP-0073 Differences in cognitive abilities: individual differences, developmental/age-related changes in knowledge, strategies and processing speed; plasticity; effects of training and education

Descrizione SS

The Child Psychopathology and Developmental Disabilities Section focuses on developmental disabilities and mental health disorders with origins in early development in infants, children, adolescents and young adults. Behavioral, cognitive, socioemotional, neurobiological, behavioral and molecular genetic, and neuroimaging approaches are examined. Emphasis is on human studies of etiology, diagnosis, phenotypic description, and intervention in developmental disabilities and mental health disorders.

- BBBP-CPDD-0074 Developmental Disabilities: Diagnosis, etiology, comorbidity, and developmental course of developmental disorders including autism, mental retardation, ADHD, motor problems, and learning disabilities.
- BBBP-CPDD-0075 Child Psychopathology: Diagnosis, etiology, comorbidity, clinical course and outcomes in child and adolescent psychopathology including mood disorders, behavior disorders, eating disorders, autoimmune disorders, stress disorders, personality disorders, and substance use disorders.
- BBBP-CPDD-0076 At-risk Infants: Short- and long-term functional and clinical outcome of infants and children with identified risk factors including early brain injury, prematurity, low birth weight, genetic risk, environmental risk and teratogen exposure, including maternal substance use.
- BBBP-CPDD-0077 Etiology and Mechanisms: Biological, genetic and neural factors underlying developmental disorders and child psychopathology. Included are molecular genetic and behavioral genetic studies, neuropathological studies, neurochemical and neuroimaging studies, and studies of teratogenic exposures, with emphasis on the relationship between these factors and clinical or functional outcomes over time.
- BBBP-CPDD-0078 Genetic and Acquired Disorders: Disorders affecting behavioral outcome including studies of genetic disorders (e.g., Williams Syndrome, Prader-Willi Syndrome, Fragile X Syndrome, Down Syndrome) and acquired disorders due to traumatic brain injury, early CNS impairment, prenatal exposure to alcohol, tobacco, or drugs, and prenatal or postnatal exposure to lead, mercury and other toxins.
- BBBP-CPDD-0079 Intervention studies: Research addressing early identification, treatment and/or rehabilitation methods for children with developmental or mental health disorders

Descrizione SS

The F12A Section reviews fellowship applications investigating language and other types of communication and their development across the lifespan [infancy through old age], primarily in humans but research involving non-human primates may be included as well. All forms of language and communication, both normal and disordered, are considered. Also considered by the F12A fellowship Section are applications investigating cognition and perception and their development across the lifespan. including normal and disordered forms of cognition and perception.

- BBBP-F12A-0111 Language development and origins of language/communication disorders
- BBBP-F12A-0112 Language comprehension and production
- BBBP-F12A-0113 Non-linguistic communication
- BBBP-F12A-0114 Brain-regions underlying language/communication abilities
- BBBP-F12A-0115 Perceptual and cognitive processes underlying reading and writing abilities
- BBBP-F12A-0116 Perceptual mechanisms for all sensory modalities
- BBBP-F12A-0117 Reasoning, decision-making, and problem-solving
- BBBP-F12A-0118 Intelligence and aptitude
- BBBP-F12A-0119 Cognitive/perceptual mechanisms underlying behavioral and mental disorders
- BBBP-F12A-0120 Acquisition of knowledge and skills
- BBBP-F12A-0121 Planning and monitoring of actions
- BBBP-F12A-0122 Executive function

Psychopathology, Developmental Disabilities, Stress and Aging Fellowship - F12B

Descrizione SS

The F12B Section reviews fellowship applications concerned with emotional, behavioral, and developmental disorders across the lifespan. Also included are comorbid substance use disorders, as well as their effects on children when they occur prenatally. Also reviewed are fellowship applications concerning psychopathology, developmental disabilities and disorders of aging such as: schizophrenia, mood disorders, suicide, anxiety and traumatic stress disorders, eating disorders, substance use disorders personality disorders, Alzheimer's disease, dementia, traumatic brain injury and sleep disorders. Also included are fellowship applications on basic biobehavioral, psychological, social and cultural processes governing affect (emotion, mood) and stress in humans.

- BBBP-F12B-0123 Behavioral, cognitive, emotional and biological factors involved in the etiology of disorders
- BBBP-F12B-0124 Diagnosis, nosology, course and outcome of disorders
- BBBP-F12B-0125 Behavioral and pharmacologic interventions/treatments; adherence to behavioral and pharmacologic treatments
- BBBP-F12B-0126 Disorders of cognitive, sensory, perceptual and motor development: Included are disorders such as mental retardation, autism, substance abuse, addiction, attention deficit and learning disabilities
- BBBP-F12B-0127 Congenital and acquired disorders that affect brain development and behavior: Included are Williams syndrome, Down syndrome, traumatic brain injury and CNS tumors/lesions
- BBBP-F12B-0128 Prenatal exposure to substance abuse and prenatal/postnatal effects of toxins
- BBBP-F12B-0129 Affect and stress processes in central and autonomic nervous system, neuroendocrine and immune function
- BBBP-F12B-0130 Psychophysiological responses to stress
- BBBP-F12B-0131 Functional consequences of affect and stress
- BBBP-F12B-0132 Comorbidity of substance abuse and psychiatric disorders

Language and Communication - LCOM

Descrizione SS

The Language and Communication Section reviews applications investigating language and other types of communication and their development across the lifespan [infancy through old age], primarily in humans. All forms of language and communication, both normal and disordered, are considered. Research methods include [but are not limited to] psychological experiments, naturalistic observation, linguistic and logical analyses, computational modeling, neuroimaging, and genetic studies.

- BBBP-LCOM-0080 Perception and production of language: spoken, written, gestural, and tactile; phonetic, phonological, morphological, lexical, and syntactic analysis; semantic and conceptual interpretation; inference; communicative intentions and speech acts; discourse and conversation processing; idioms and figurative language; dialect, register, and style; code switching; metalinguistic abilities
- BBBP-LCOM-0081 Language development: Acquisition of first and second language, language change in adulthood; literacy development, bilingualism and multilingualism; sign language; language decline.
- BBBP-LCOM-0082 Perceptual and cognitive processes underlying reading and writing abilities; acquisition and development, fluency, instructional methods, interventions for reading and writing disorders.
- BBBP-LCOM-0083 Non-linguistic communication: Facial, manual, and bodily gestures; vocal, pictorial, and multimedia communication
- BBBP-LCOM-0084 Neurobiological and genetic foundations underlying language and communication abilities; including speech, reading and writing, non-human communication.
- BBBP-LCOM-0085 Nature, origins, developmental course, assessment, prevention, treatment and remediation of language and communication disorders (e.g., aphasia, dyslexia, dementia-related impairments, phonological disorders, specific language impairment).
- BBBP-LCOM-0086 Relations between language and thought; social roles and norms on use of language and other forms of communication; social-cultural influences of assessment and interventions for language and communication disorders

Biobehavioral Mechanisms of Emotion, Stress and Health - MESH

Descrizione SS

The Biobehavioral Mechanisms of Emotion, Stress and Health Section reviews applications on the bidirectional interactions of stress, emotion, and physical and mental illness and health, with an emphasis on underlying biological mechanisms.

- BBBP-MESH-0087 Subjective emotional states, emotional expression, regulation of emotion and mood, socioemotional development, emotional consequences of life events and stressful conditions, resilience, and cognitive influences on emotion, stress, and coping.
- BBBP-MESH-0088 Bidirectional relationships of affect and stress with psychological function, neurobiological, neuroendocrine, and immune substrates. Methods include neuroimaging, imaging, psychophysiology, cardiovascular reactivity, respiratory function, HPA axis, arousal, and startle.
- BBBP-MESH-0089 Clinical studies of the interactions of sleep and circadian rhythm with stress and health.
- BBBP-MESH-0090 Influence of personality, affective and cognitive factors, temperament, genetic predispositions, developmental and family experiences, marital status, social relationships, sexual identity, gender, age, ethnicity, culture, and socioeconomic status on affect and stress and their linked CNS and ANS processes.
- BBBP-MESH-0091 Effects of affect and stress on cognitive and motor function, pain and other symptom perception, participation in daily life activities, subjective well-being and quality of life, and social interaction, coping processes and outcomes.
- BBBP-MESH-0092 Biological responses to acute or chronic psychological stress and their moderation by individual, situational, or environmental factors or physiological factors.

Motor Function, Speech and Rehabilitation - MFSR

Descrizione SS

The Motor Function, Speech and Rehabilitation Section reviews applications on normal and disordered motor function, including speech and voice production. Function across the lifespan [infancy through old age], in humans and other animals, is addressed. Also included are the development and evaluation of behavioral preventive and therapeutic interventions for movement, speech, voice, and related disorders. Although the focus is on behavior, studies may also consider associated anatomical, physiological, neural, hormonal, and genetic factors. Methods include [but are not limited to] behavioral experiments, physiological measurement, acoustic analysis, structural and functional imaging, and computational modeling.

- BBBP-MFSR-0093 Movement: Control of limbs and extremities; body posture and balance; locomotion; head, jaw, mouth, laryngeal, eye, facial and related movements; sensory-motor integration; perception – action; motor learning and motor skills; swallowing; movement disorders [including dyskinesia, dysphagia, dyspraxia, dystonia, paralysis, parkinsonism, repetitive stress injury, spasticity, tremor].
- BBBP-MFSR-0094 Sound production: Motor and perceptual aspects of production of speech and other sounds via respiratory, laryngeal, and articulatory mechanisms; interactions of motor, acoustic and perceptual aspects of sound production; relations with breathing, chewing, swallowing, etc.; speech, voice, and related disorders [including dysarthria, dysfluency, dysphagia, dysphonia].
- BBBP-MFSR-0095 Normal and abnormal development of movement and sound production; perceptual – motor development; aging-related changes; interactions with other physical conditions.
- BBBP-MFSR-0096 Prevention and treatment of movement, speech, voice, and related disorders/disabilities; physical rehabilitation following disease or injury; prosthetic and adaptive technologies; related exercise

Biobehavioral and Behavioral Processes Small Business Activities -SBBB

Descrizione SS

Small Business Activities applications reviewed by the BBBP Group [SBBB] cover a broad spectrum of research on all aspects of biobehavioral and behavioral processes in normal and disordered populations.

- BBBP-SBBB-0098 small business reviews applications Science Education, Communication and Childhood Disorders : science education for the non-professional and educational technology,
- BBBP-SBBB-0099 small business reviews applications Science Education, Communication and Childhood Disorders : speech - including augmentative and alternative communication devices and automated translation devices, deafness, language and reading;
- BBBP-SBBB-0100 small business reviews applications Science Education, Communication and Childhood Disorders :childhood psychopathology,

BBBP-SBBB-0101	small business reviews applications Science Education, Communication and Childhood Disorders : developmental disabilities - mental retardation, autism, learning disabilities, ADHD,
BBBP-SBBB-0102	small business reviews applications Science Education, Communication and Childhood Disorders : parenting as related to childhood psychopathology/disabilities, deafness and language/reading disorders.
BBBP-SBBB-0104	Small Business: Psychopathology and Adult Disorders: adult psychopathology - schizophrenia, depression, anxiety disorders,
BBBP-SBBB-0105	Small Business: Psychopathology and Adult Disorders: disorders of aging - Alzheimer's disease, Parkinson's disease;
BBBP-SBBB-0106	Small Business: Psychopathology and Adult Disorders: sleep and neuropsychology;
BBBP-SBBB-0107	Small Business: Psychopathology and Adult Disorders: cognitive aging, memory and driving simulation;
BBBP-SBBB-0108	Small Business: Psychopathology and Adult Disorders: co-morbid substance abuse;
BBBP-SBBB-0109	Small Business: Psychopathology and Adult Disorders: management of emotion in adults - e.g., anger and stress;
BBBP-SBBB-0110	Small Business: Psychopathology and Adult Disorders: automated analyses of animal behavior related to psychopathology, substance abuse and/or mental disorders.

BCMB

BCMB - Biological Chemistry and Macromolecular Bio

Descrizione IRG:

The Biological Chemistry and Macromolecular Biophysics [BCMB] Group will review research applications on biochemical, biophysical, and chemical approaches to biomedical problems. The Group has special expertise in macromolecular mechanisms, biochemistry, chemistry, structural biology, enzymology, biophysical methods, and the theory underlying the function of biological molecules and their interactions. This Group encompasses the basic physical sciences that underlie biology at the molecular level. The Group also bridges the development of technologies with a molecular focus and their application to biological problems.

BCMB - *BBM*

Biochemistry and Biophysics of Membranes - BBM

Descrizione SS

The Biochemistry and Biophysics of Membranes [BBM] Section reviews research applications concerned with all biochemical and biophysical aspects of membrane structure and function, and with their constituent protein and lipid components. Emphasis is on the molecular details of processes that occur on or within membranes. Areas include use of biochemical and biophysical techniques to understand the structure and function of membranes and membrane-proteins.

BCMB-BBM-0133	Membrane architecture: lipid-protein interactions, membrane protein folding, assembly, structure, and dynamics.
BCMB-BBM-0134	Methods for membrane protein structure determination, including crystallization, solid state NMR and cryo-electron microscopy.
BCMB-BBM-0135	Biophysics of membrane fusion mechanisms, of membrane interfaces, and signaling
BCMB-BBM-0136	Enzyme mechanisms within membranes and interfaces: membrane-based energy transduction, membrane-bound enzymes, function of transporters, channels, receptors, glycoproteins, lipid metabolism and lipid function.
BCMB-BBM-0137	Computational and modeling approaches to membranes and membrane proteins.

Descrizione SS

The Enabling Bioanalytical and Biophysical Technologies [EBT] Section reviews both hypothesis and non-hypothesis driven applications focused on the development of new bioanalytical and biophysical tools, emerging techniques, and instrumentation. Emphasis is on research that probes the molecular aspects of biological systems using novel technologies or existing techniques that have been enhanced by improving the resolution, sensitivity, throughput, and fundamental underpinnings of these techniques.

- BCMB-EBT-0138 Bioanalytical techniques such as sensors, separations, mass spectrometry, molecular spectroscopy, electrochemistry arrays, microfluidics and lab-on-a-chip, and novel assays.
- BCMB-EBT-0139 Biophysical techniques such as magnetic resonance, optical and electron microscopy
- BCMB-EBT-0140 Synthesis of novel materials, labels and reagents and surface chemistries developed for use in bioanalytical or biophysical methods, including nanotechnology.
- BCMB-EBT-0141 The feasibility of recently introduced technologies to examine and explore biological systems (for example, proteomics, genomics, metabolomics, sequencing, screening, characterizing macromolecular interactions, or clinical applications) both in vivo and in vitro.
- BCMB-EBT-0142 Software development and (bio) informatics/chemometrics applied to bioanalytical instrumentation, instrumentation control, and interpretation of experimental data

BCMB - MSFA**Macromolecular Structure and Function A - MSFA****Descrizione SS**

The Macromolecular Structure and Function A [MSFA] Section reviews applications that focus on the biochemistry and biophysics of metal center containing proteins and complexes as well as the regulation of metal ion concentration in cells. A broad range of physical, chemical, genetic, kinetic, mechanistic, thermodynamic and theoretical approaches are included for studying the properties, reactivity, and interaction of a metal center with the host molecule as well as its assembly into the complex and the regulation of concentration of a metal in vivo.

- BCMB-MSFA-0143 Metalloenzymes and their mechanisms: biochemical, spectroscopic, genetic, kinetic and structural methods applied to understand the mechanism of the metal center.
- BCMB-MSFA-0144 Synthetic and theoretical models of metallo-active sites: small molecule complexes and designed peptides intended to mimic an enzyme active site reactivity or metal center specificity.
- BCMB-MSFA-0145 Chemistry of metal centers and organic redox active cofactors: redox chemistry of oxygen/nitrogen species. Chemistry of reactive oxygen/nitrogen metabolism: methods of generation and mitigation as well as its undesired side reactions.
- BCMB-MSFA-0146 Biogenesis of complex centers: mechanism of assembly of complex metal clusters as well as their incorporation into their host proteins. Biosynthesis of organic redox active cofactors.
- BCMB-MSFA-0147 Metal ion homeostasis and metabolism: regulation of influx, efflux and transport of iron, copper, zinc and manganese as well as other metals ions whose concentration must be closely controlled or limited. Mechanisms of metal ion toxicity.

BCMB - MSFB**Macromolecular Structure and Function B - MSFB****Descrizione SS**

The Macromolecular Structure and Function B [MSFB] Section reviews applications that address basic structure-function relationships in a variety of systems, using biophysical and biochemical approaches, both experimental (e.g., X-ray crystallography, NMR, fluorescence spectroscopy) and computational modeling (e.g., molecular dynamics simulations). The emphasis is on elucidating structural and dynamical characteristics of individual proteins and nucleic acids, and their complexes, and how those properties affect function of the molecules.

- BCMB-MSFB-0148 RNA structure and dynamics; RNA-protein interactions, RNA catalysis, folding and splicing and ribozyme-based therapeutics.
- BCMB-MSFB-0149 DNA structures, including of those of chemically modified DNAs, structural aspects of DNA replication and repair processes, aspects of protein-DNA systems, such as the effects of protein folding on histone-DNA interactions.
- BCMB-MSFB-0150 Properties of proteins: structural dynamics of proteins, folding and misfolding processes; engineering proteins to enhance function, computer-aided drug design, allostery and cooperativity in enzyme mechanism and control, chaperones, thermodynamic and ele
- BCMB-MSFB-0151 Signal transduction in select systems, such as circadian rhythm proteins, and chemokines and their receptors.

BCMB-MSFB-0152 Enzymology of protein glycosylation and the consequences thereof, structural aspects of ubiquitination and subsequent degradation of proteins in cells

BCMB- *MSFC* **Macromolecular Structure and Function C - MSFC**

Descrizione SS The Macromolecular Structure and Function C [MSFC] Section reviews applications concerned with the structural biology of proteins and nucleic acids in macromolecular assemblies, involving a broad range of biochemical and biophysical approaches to elucidate molecular interactions. Emphasis is on the application of atomic- and molecular-level information to understand biological function.

BCMB-MSFC-0153 Protein-protein and protein-nucleic acid interactions, small molecule interactions with proteins and nucleic acids, and mechanisms of allostery.

BCMB-MSFC-0154 Protein interaction networks and signal transduction.

BCMB-MSFC-0155 Molecular motors, macromolecular machines, and systems driven by energy-dependent conformational changes including ATPases.

BCMB-MSFC-0156 Biophysical studies of muscle structure and function.

BCMB-MSFC-0157 Single molecule investigations.

BCMB- *MSFD* **Macromolecular Structure and Function D - MSFD**

Descrizione SS The Molecular Structure and Function Section D [MSFD] reviews applications that propose the development of new techniques in computational molecular modeling and simulation; theoretical mathematical and physico-chemical analysis; and bioinformatics assessment of the structure, dynamics and function of biological macromolecules as isolated entities, in multi-component complexes or in association with ligand molecules. Applications that draw heavily upon vigorous application of established computational techniques are also reviewed in MSFD. Many applications involve the close interplay of theory/modeling with predictive analysis of experimental data derived from methods such as x-ray crystallography, cryo-electron microscopy, and nuclear magnetic resonance or other spectroscopies with the preponderant effort placed on the computational/theoretical analysis. Emphasis is on the study of non-membrane associated soluble proteins, nucleic acids, and carbohydrate systems.

BCMB-MSFD-0158 Molecular modeling and refinement of 3-D structures of macromolecules; de novo design of proteins; prediction and modeling of protein-ligand interactions and development of docking protocols; biophysical theory of macromolecular structure, function and dynamics; and prediction of macromolecular interactions at varying spatial resolutions and timescales.

BCMB-MSFD-0159 Computational methods of ligand screening in drug development and protein-protein docking.

BCMB-MSFD-0160 Development of methodologies for assessing sequence-structure-function relationships and formulating prediction of macromolecular function.

BCMB-MSFD-0161 Development of computational protocols for molecular visualization, annotation, and geometric and topological characterization of proteins and polynucleotide's.

BCMB-MSFD-0162 Design and application of classical, quantum and QM/MM simulation methods to macromolecular systems, including validation via experimental comparison.

BCMB- *MSFE* **Macromolecular Structure and Function E - MSFE**

Descrizione SS The Macromolecular Structure and Function E Section (MSFE) review applications that focus on the structure and structure-function relationships of enzymes and their complexes. Experimental approaches include the development and application of physical and chemical methods to study interactions between enzymes and their effectors and substrates. Applications evaluated in this Section cover a broad range of theoretical, computational and experimental methods that include but not limited to quantum mechanics, molecular mechanics, kinetic, mechanistic, and thermodynamic characterization of enzymes and their functions. The most commonly used experimental methods are NMR, X-Ray, laser spectroscopy and electron microscopy. The emphasis is on elucidating structure-function relationships of enzymes in their native biological systems.

BCMB-MSFE-0163 Mechanistic enzymology involving protein and nucleic acid catalysts.

BCMB-MSFE-0164 Protein-ligand interactions and dynamics.

- BCMB-MSFE-0165 Inhibitors of enzymes and their mechanisms, drug chemistry and metabolizing enzymes, biochemical mechanism based drug development.
- BCMB-MSFE-0166 Macromolecular studies of metabolic pathways and networks.
- BCMB-MSFE-0167 Computational and theoretical studies of biochemical reactions, application of quantum mechanics and molecular mechanics to studies of enzyme mechanisms, genomic enzymology, sequence-structure analysis to uncover mechanistic strategies of superfamilies

BCMB - *SBCA*

Synthetic and Biological Chemistry A - SBCA

Descrizione SS

The Synthetic and Biological Chemistry A [SBCA] Section reviews applications in the areas of chemical synthesis and chemical biology research that may contribute to advances in biology and medicine, either at a fundamental or applied level. Areas reviewed by SBCA include synthetic methodology development, nucleic acid chemistry, carbohydrate chemistry, supramolecular chemistry and the chemistry of metals, as well as the design and discovery of small molecules with potential biological or pharmaceutical activity.

- BCMB-SBCA-0168 Synthetic methodology and target oriented synthesis: Discovery and development of synthetic strategies, methodologies, reactions, reagents, and catalysts for use in chemical synthesis. This includes the synthesis of complex natural products and biologically-relevant, small molecule targets of defined structure.
- BCMB-SBCA-0169 Chemical biology: Design and synthesis of bioactive small molecules to probe biological systems, including enzyme inhibitors.
- BCMB-SBCA-0170 Nucleic acid chemistry: Studies directed toward understanding the chemical principles for the sequence specific recognition and modulation of DNA and RNA, including biomimetic approaches for regulation of gene expression.
- BCMB-SBCA-0171 Carbohydrate chemistry: The synthesis of sugars and oligosaccharides for studying biological processes such as disease states, vaccines, and cell recognition phenomena.
- BCMB-SBCA-0172 Supramolecular Chemistry: The study of molecular recognition and host-guest interactions, the synthesis of polymers and molecular assemblies for use in biological systems and medicine.
- BCMB-SBCA-0173 Metals in chemistry and biology: Using synthetic chemistry and coordination chemistry to develop metallo reagents to decipher problems in biological systems

BCMB - *SBCB*

Synthetic and Biological Chemistry B - SBCB

Descrizione SS

The Synthetic and Biological Chemistry B [SBCB] Section reviews applications in the areas of chemical synthesis and chemical biology research that may contribute to advances in biology and medicine, either at a fundamental or applied level. Areas reviewed by SBCB include synthetic methodology development, natural product synthesis and biosynthesis, peptide and protein chemistry, as well as the design and discovery of small molecules with potential biological or pharmaceutical activity.

- BCMB-SBCB-0174 Synthetic methodology and target-oriented synthesis: Discovery and development of synthetic strategies, methodologies, reactions, reagents, and catalysts for use in chemical synthesis. This includes the synthesis of complex natural products and biologically-relevant, small molecule targets of defined structure.
- BCMB-SBCB-0175 Chemical biology: Design and synthesis of bioactive small molecules to probe biological systems, including enzyme inhibitors and other protein ligands.
- BCMB-SBCB-0176 Peptide and protein chemistry: Chemical synthesis or engineering of natural and unnatural peptides/proteins. Designed systems in which chemical manipulation of protein structure is used to interrogate functional biological interactions.
- BCMB-SBCB-0177 Natural product biosynthesis and discovery: Elucidation and engineering of biosynthetic pathways by which natural products are constructed in host organisms, including the biosynthesis of unnatural small molecules via genetic manipulation. Isolation and characterization of bioactive chemical compounds from natural sources.

Descrizione IRG:

The Biology of Development and Aging Integrated Review Group (Group) will consider research applications that are focused on Development and/or Aging and that employ approaches at a variety of levels from molecules to whole organisms. Development and Aging are inherently integrative research areas focusing on biological changes over time. Proposals in this Group will frequently transcend the boundaries of single organs or systems.

Areas of review related to development include:
Morphogenesis and pattern formation; gastrulation; cell fate, lineage and differentiation; organogenesis; gametogenesis; pre- and post-implantation development; regeneration; evolutionary aspects of development; and the molecular basis of primordial birth defects.

Areas of review related to both development and aging include:
Chromosome dynamics; cell cycle control; cell death; responses to stress; cellular signaling; the biology and applications of stem cells; and tissue repair.

Areas of review related to aging include:
Determinants of longevity; age-related changes in physiological functions; geriatric syndromes and diseases; animal models of aging; predictive markers of biological health and aging; and mechanisms of exceptional aging.

BDA- ASG

Aging Systems and Geriatrics - ASG**Descrizione SS**

The Aging Systems and Geriatrics [ASG] Section reviews applications on studies of age-related conditions and diseases that transcend single organ systems or disciplines, and which may require integrated experimental or observational approaches.

- BDA-ASG-0198 Age-related changes in the regulation of complex physiological functions (e.g., motor performance, balance, glucose metabolism, immune defense, menopause, and interventions to ameliorate such age-related changes).
- BDA-ASG-0199 Geriatric syndromes (multifactorial health conditions due to system impairments that increase vulnerability to challenges) including, but not limited to, falls, syncope, frailty, immobility, delirium, incontinence, polypharmacy, malnutrition, mood disorders, sarcopenia, chronic pain, loss of functional independence, and failure to thrive.
- BDA-ASG-0200 Systemic impact of co-morbidities on health status and clinical outcomes in older adults.
- BDA-ASG-0201 Multicomponent, pleiotropic (e.g., exercise, nutrition) and mechanism-driven intervention studies addressing geriatric syndromes or age-related diseases affecting multiple systems which are unique or highly prevalent in elderly people or aging animals (e.g., congestive heart failure, atrial fibrillation, hypertension, type 2 diabetes, osteoarthritis, osteoporosis).
- BDA-ASG-0202 Development and validation of biomarkers of biological health and aging.
- BDA-ASG-0203 Modeling of complex regulatory networks such as those affecting cardiovascular function, circadian rhythms, frailty and postural control, and their alteration with age.
- BDA-ASG-0204 Regulation of life span and rates of aging changes in animal models and humans employing approaches such as caloric restriction, and studies of animal models of human populations especially resistant to aging.

Descrizione SS

The Cellular Mechanisms in Aging and Development [CMAD] Section reviews applications that address fundamental studies relating to the biological, molecular, genomic, biochemical, metabolic and physiological mechanisms that determine lifespan and longevity.

- BDA-CMAD-0191 Determinants of lifespan and longevity in model organisms: caloric restriction/dietary restriction; role of insulin/IGF signaling and receptors in determining longevity.
- BDA-CMAD-0192 Theories of aging: oxidative stress; mitochondrial dysfunction; DNA damage; protein misfolding; autophagy; proteosomal degradation; apoptosis; cellular senescence; replicative senescence/cancer; telomeres and telomerase in aging.
- BDA-CMAD-0193 Genetics and epigenetics of aging including genetic manipulation of aging phenotype.
- BDA-CMAD-0194 Aging syndromes: Werner Syndrome (WS), Hutchinson Gilford Progeria Syndrome (HGPS); dyskeratosis congenita; laminopathies; other progeroid syndromes of accelerated aging.
- BDA-CMAD-0195 Immunosenescence: changes in immune function with age; thymic involution; macrophage function; inflammation.
- BDA-CMAD-0196 Adult stem cells in the replacement/repair of aging/damaged tissue.
- BDA-CMAD-0197 Muscle aging: mechanisms of signaling and satellite cell proliferation in alleviating sarcopenia.

BDA - *DEV1***Development-1 - DEV1****Descrizione SS**

The Development-1 [DEV1] Section addresses developmental questions approached at the levels of genetics, cells, tissues, organs and the whole organism in diverse kingdoms. Emphasis is on gametogenesis, organogenesis, metamorphosis, and regeneration

- BDA-DEV1-0178 Embryonic stem cell differentiation into germ layers and organ systems, differentiation, including changes in gene expression and all processes leading to tissue formation and the adoption of specific cell fates.
- BDA-DEV1-0179 Events leading to formation of organs including heart, lung, limbs, brain and spinal cord, endodermal organs, gonads, and reproductive tract.
- BDA-DEV1-0180 Gametogenesis: stem cell niche in gametogenesis; germ cell/somatic cell interactions; imprinting; and meiosis in a developmental context.
- BDA-DEV1-0181 Metamorphosis in invertebrates or vertebrates, regeneration of body parts (organs, limbs, nervous system, etc.).
- BDA-DEV1-0182 Regulatory networks in development, particularly in the context of gametogenesis, organogenesis, metamorphosis, and regeneration.
- BDA-DEV1-0183 Signaling in development.
- BDA-DEV1-0184 Cellular processes in development, including regulation and mechanisms of apoptosis in development

BDA - *DEV2***Development-2 - DEV2****Descrizione SS**

The Development-2 [DEV2] Section reviews applications covering a wide range of topics in developmental biology using diverse animal models. Cell biological, biochemical, genetic, imaging and molecular approaches to developmental problems at the level of cells, tissues, organs and the whole organism are appropriate. Emphasis is on pattern formation, stem cell biology, evolution, birth defects, and early embryonic development.

- BDA-DEV2-0185 Stem cell biology: totipotency and cell commitment.
- BDA-DEV2-0186 Early embryonic development: establishment and maintenance of cell polarity in eggs and embryos; tracing of cell lineage; cell migration; gastrulation; epithelial-mesenchymal transformation.
- BDA-DEV2-0187 Pattern formation: the process of cells establishing and refining boundaries and cellular identities that lead to morphological and biochemical patterns; the analysis of signal transduction pathways and signal integration during development.
- BDA-DEV2-0188 Regulatory networks: whole genome approaches to profile and analyze regulatory networks in development particularly in the context of pattern formation, birth defects, early embryonic development.

BDA-DEV2-0189 Evolution of development: comparative development to understand conserved developmental processes and how they evolved.

BDA-DEV2-0190 Birth defects: mechanism-based analyses of birth defects

BDA- *SBSE*

BDA Small Business Activities - SBIR/STTR Special Emphasis Panels - BDA Small Business SEPs

Descrizione SS

The Biology of Development and Aging IRG (BDA) Small Business Activities Special Emphasis Panel will review Small Business Innovation Research (SBIR) and Small Business Technology Transfer Research (STTR) applications in the areas of developmental biology and aging, using diverse animal and plant models or human studies, and employing approaches at a variety of levels from molecules to whole organisms. Proposals that concern geriatric studies may transcend the boundaries of single organs or systems (e.g., in co-morbidities), and may require integrated experimental, genetic or observational approaches.

- BDA-SBSE-0206 Basic biology of stem cells: in vitro culture of blastocysts and embryos; animal (invertebrate and vertebrate) and human embryonic and adult stem cells: strategies for their culture and differentiation both in vitro and in vivo, studies on totipotency and
- BDA-SBSE-0207 Gamete and embryo cryopreservation methodologies.
- BDA-SBSE-0208 Novel strategies for animal cloning.
- BDA-SBSE-0209 Use of reverse genetic approaches for addressing developmental questions - e.g., RNA interference (RNAi), morpholinos, and other oligonucleotide technologies.
- BDA-SBSE-0210 Development of toxicological and teratological assays in model organisms (e.g., zebrafish, frog, mouse, Drosophila, C. elegans) for identification of birth defects.
- BDA-SBSE-0211 New models of development or aging: including transgenic, animal, cellular and plant models of development, birth defects, cell death, regeneration and repair, and aging/longevity.
- BDA-SBSE-0212 Methods for analysis of apoptosis and apoptotic signal imaging in relation to remodeling of organ systems during development and aging.
- BDA-SBSE-0213 Markers that may predict aging or cellular senescence; inhibitors of senescence.
- BDA-SBSE-0214 Novel devices and monitoring systems for geriatric patients (i.e., patients with age-related conditions involving multiple systems and/or multifactorial mechanisms).
- BDA-SBSE-0215 Interventions for age-dependent cognitive and physiological deficits in humans (such as menopause, frailty, infections) when studies of geriatric morbidities transcend single organ systems or disciplines and may require integrated experimental, genetic or observational approaches.

Descrizione IRG:

The Brain Disorders and Clinical Neuroscience [BDCN] Group reviews grant applications that have neural disorders and/or injury of the nervous system as their main focus. Investigations appropriate for review in the BDCN Group may include those using animal models of neural injury or disease, investigations based on the study of specific patient populations, or investigations focused on the development of rehabilitative and therapeutic strategies. Specific areas of interest include the investigation of traumatic brain or spinal cord injury, the consequences of episodes of ischemia or hypoxia, the study of mental disorders, neurodegenerative diseases, and other neuropathies. These specific areas of interest may be studied from the perspective of neuroanatomical or neurophysiological alterations, changes in neurotransmitter or neurotrophin function or metabolism, the genetic, cellular, or molecular basis of alterations induced by disease or injury, the influence or involvement of the immune or vascular systems in a neural disease process or response, and the neurological basis of addictive, cognitive, behavioral, and emotional disorders.

BDCN - AED**Anterior Eye Disease - AED****Descrizione SS**

The Anterior Eye Disease [AED] Section reviews basic, applied, and clinical research proposals to investigate the cornea, lens, conjunctiva, iris, ciliary body, trabecular meshwork, lacrimal glands, and retinal ganglion cells in the context of glaucoma. Proposals reviewed by AED address anatomical, biochemical, biophysical, cell biological, physiological, molecular and genetic aspects of the anterior eye related to normal and pathological processes. Studies using cell and tissue culture models, animal models, and clinical studies are reviewed.

- BDCN-AED-0216 Disorders of the anterior segment of the eye, including the following: cataracts, dry eye, congenital and developmental abnormalities, inflammatory diseases, infectious diseases, hereditary and degenerative diseases, glaucoma, tumors, injury, trauma, and ocular manifestations of systemic diseases,
- BDCN-AED-0217 Pathology and wound healing of the eye, including control of cell cycle, cell signaling, apoptosis, response to stress and tissue repair, angiogenesis.
- BDCN-AED-0218 Design and evaluation of new tests for diagnosis and treatment of anterior eye disease and glaucoma.
- BDCN-AED-0219 Unique aspects of ocular immunology and inflammation, including uveitis, immune privilege, and response to infectious disease.
- BDCN-AED-0220 Development of normal and experimentally or pathologically altered eye tissues, excluding the retina/choroid.
- BDCN-AED-0221 Pathogenesis, prevention, and treatment of ocular infections by bacteria, viruses, parasites, and fungi

BDCN - ANIE**Acute Neural Injury and Epilepsy - ANIE****Descrizione SS**

The Acute Neural Injury & Epilepsy (ANIE) Section addresses anatomical, cellular and functional basis of neural disease and injury. Emphasis is on the neural substrate, functional consequences, and the development of therapeutic and rehabilitation strategies. This Section considers patient-oriented research and animal models.

- BDCN-ANIE-0222 Relevant disorders include stroke/ischemia, epilepsy, spinal cord injury and traumatic brain injury.

- BDCN-ANIE-0223 Neuropathological, neuroimaging, electrophysiological, and functional studies to monitor the onset, progression and treatment of brain and spinal cord disease and injury; therapeutic approaches and clinical studies; cerebral blood flow and metabolism in the context of clinical neuroimaging.
- BDCN-ANIE-0224 Changes in functional domains that are consequences of disease and injury; strategies for therapeutic intervention.
- BDCN-ANIE-0225 Studies of changes in the neural substrate and function of brain and spinal cord in response to disease and injury.
- BDCN-ANIE-0226 Recovery of function/rehabilitation; neurological and functional evaluation of neural prostheses, electrical/magnetic stimulation, behavioral and pharmacological interventions, and physical therapy.

BDCN - *BINP* Brain Injury and Neurovascular Pathologies - BINP

Descrizione SS The Brain Injury and Neurovascular Pathologies [BINP] Section reviews applications aimed to understanding mechanisms of neural injury, related vascular abnormalities, and alterations in the blood brain barrier in stroke, brain ischemia, traumatic brain injury, blast injury, and intracerebral hemorrhage among other conditions.

- BDCN-BINP-0227 Development of novel in vivo and in vitro models of acute neural injury.
- BDCN-BINP-0228 Identification and analysis of molecular mechanisms and signal transduction pathways of cell death and a role for various types of cell death in acute neural injury.
- BDCN-BINP-0229 Identification of novel therapeutic targets, neuroprotective agents and therapeutic strategies to prevent and treat neural injury.
- BDCN-BINP-0230 Studies aimed at elucidating a role for age, gender, genetics, and environment in response to and recovery from acute brain injury.
- BDCN-BINP-0231 A role for blood brain barrier and vascular functions in development and treatment of neural injury.

BDCN - *CDIN* Cell Death in Neurodegeneration - CDIN

Descrizione SS The Cell Death in Neurodegeneration [CDIN] Section addresses the underlying bases of chronic neural disorders. This Section focuses on specific diseases and disease processes and primarily reviews studies of animal models.

- BDCN-CDIN-0232 Neurodegenerative diseases such as Alzheimer's, Parkinson's, Huntington's disease, and ALS, dystonia/ataxia.
- BDCN-CDIN-0233 Animal models of neurodegeneration; generation of relevant transgenic models, models to evaluate treatments to limit or prevent neurodegeneration and its functional consequences.
- BDCN-CDIN-0234 Mechanisms of degeneration and neurotoxicity in neurodegenerative diseases; role of intracellular Ca⁺⁺, glutamate excitotoxicity, metals, oxidative stress and free radicals, amyloid and paired helical filaments.
- BDCN-CDIN-0235 Metabolic abnormalities in degeneration; mitochondrial function, interaction of genetics, environment, drugs, metabolites, and age on cell dysfunction and neuropathology.
- BDCN-CDIN-0236 Abnormal protein and macromolecular function; synthesis, assembly, processing, trafficking, structure/function, regulation, and degradation of proteins and other macromolecules implicated in neurodegenerative diseases

BDCN - *CNBT* Clinical Neuroimmunology and Brain Tumors - CNBT

Descrizione SS The Clinical Neuroimmunology and Brain Tumors [CNBT] Section reviews applications involving central and nervous system disorders where the focus is on immune response, inflammation and infections. The experimental systems include in vitro, animal models of human neuromuscular and neurodegenerative disorders as well as patient-oriented research.

- BDCN-CNBT-0237 The relevant diseases are multiple sclerosis, myasthenia gravis, inflammatory neuropathies and myopathies, infectious diseases of the nervous system, prion disease and nervous system tumors.
- BDCN-CNBT-0238 Immunological processes in neural disease or injury: Cellular and humoral responses, innate immunity, inflammation, autoimmunity, immunotherapy, neuroimmune modulation, and cytokines/chemokines.

- BDCN-CNBT-0239 Demyelination, neuroinflammation in Alzheimer's disease and Parkinson's disease; reactive microglia, astrocytes, macrophages, axonal damage, regeneration, and myelination/remyelination.
- BDCN-CNBT-0240 Infectious diseases of nervous system: The parasitic, fungal, bacterial, and viral agents (excluding HIV) as well as prions causing prominent neurological symptoms; viral neurotropism/invasion, uptake, spread and characterization of infectious prions.
- BDCN-CNBT-0241 The role of blood brain barrier in inflammation, migration of leukocytes and trafficking in brain, viral gene therapy, cell transplantation, biomarkers and immune cell mediated vascular permeability.
- BDCN-CNBT-0242 Central nervous system tumors (emphasis on CNS functional consequences): Diagnosis, mechanism, and treatment of glioblastomas, medulloblastomas, neuroblastomas and gliomas; tumorigenesis, migration, immune response, gene therapy, invasion, and angiogenesis.

BDCN - CNN Clinical Neuroscience and Neurodegeneration - CNN

Descrizione SS The Clinical Neuroscience and Neurodegeneration [CNN] Section addresses chronic and neurodegenerative diseases. Emphasis is on the neural substrate, functional consequences and the development of therapeutic strategies for chronic/neurodegenerative disorders. This Section primarily considers patient-oriented research but also clinically oriented research using animal models.

- BDCN-CNN-0243 Alzheimer's disease and other dementias.
- BDCN-CNN-0244 Parkinson's disease and other movement disorders (Huntington's, Dystonias, Ataxias).
- BDCN-CNN-0245 Amyotrophic Lateral Sclerosis (ALS) and related motor neuron disorders.
- BDCN-CNN-0246 Neuroimaging, functional, biochemical, and neuropathological studies to assess the onset, progression, treatment, and development of biomarkers for brain disorders.
- BDCN-CNN-0247 Changes in learning, memory, language, attention, behavior, and other functional domains that are consequences of disease.
- BDCN-CNN-0248 Cellular, anatomical, and systems-based studies of changes in the neural substrate and function of brain in response to disease

BDCN - CNNT Clinical Neuroplasticity and Neurotransmitters - CNNT

Descrizione SS The Clinical Neuroplasticity and Neurotransmitters (CNNT) Section reviews applications from the perspective of neurotransmitters and neurotrophic factors. The areas covered are neurodegeneration (Parkinson's disease, ALS, neuropathies) spinal cord injuries and epilepsy. The Section evaluates predominantly small animal models

- BDCN-CNNT-0249 Neurotransmitter metabolism, receptor regulation at the molecular level, abnormalities of synaptic physiology; role of neurotrophins, growth factors, imaging in small animal models of neurotransmitter and neurotrophin pathways.
- BDCN-CNNT-0250 Pharmacological studies; therapeutic strategies involving receptor agonists and antagonists; pharmacological effects on synaptic physiology, neurotransmitter pathways, neurotrophins and neurohormones.
- BDCN-CNNT-0251 Mechanisms of degeneration, plasticity and recovery. Alterations in synaptic function, neurotransmitter function, trophic factors and neurogenesis with an emphasis on epilepsy, spinal cord injury, Parkinson's disease.
- BDCN-CNNT-0252 Gene therapy, tissue transplantation including stem cells and in vivo neurogenesis in epilepsy, spinal cord injury, Parkinson's disease

BDCN - DBD Developmental Brain Disorders - DBD

Descrizione SS The Developmental Brain Disorders [DBD] Section reviews applications concerned with the genetic, metabolic, infectious, environmental and behavioral factors in fetal, neonatal or pediatric brain that lead to abnormal brain development and function. Emphasis is on the vulnerability and plasticity of the developing brain in either clinical (patient-oriented research in infants/children) or basic studies (relevant animal models).

- BDCN-DBD-0253 Brain development in utero: Transplacental exposure to maternal drugs, and metabolic imbalances.

- BDCN-DBD-0254 Genetic, metabolic and morphological abnormalities: Developmental abnormalities of brain structure, volume, and ventricular space; congenital CSF abnormalities [hydrocephalus]; developmental aspects of inborn errors of metabolism, storage diseases, and neurotransmitter/receptor function; genetic basis of metabolic and morphological abnormalities; Identification and characterization of genetic mechanisms and development of animal models and therapeutic strategies specifically relevant to disorders of the developing brain.
- BDCN-DBD-0255 Perinatal insults and low-birth-weight infants: Developmental aspects of perinatal injury, hypoxic/ischemia, pediatric epilepsy, congenital infections involving the CNS - excluding HIV.
- BDCN-DBD-0256 Developmental disorders: Mental retardation, learning disabilities, specific language impairment, dyslexia, autism, cerebral palsy, sudden infant death syndrome - SIDS, and other relevant disorders.
- BDCN-DBD-0257 Therapeutic interventions and brain plasticity: Medical, surgical, pharmacological, and behavioral interventions; plasticity and rehabilitation in the developing brain; clinical studies in children

BDCN - *NPAS*

Neural Basis of Psychopathology, Addictions and Sleep Disorders - NPAS

Descrizione SS

The Neural Basis of Psychopathology, Addictions and Sleep Disorders [NPAS] Section addresses the neurobiological bases of addictive, behavioral, cognitive and emotional disorders. NPAS covers a very broad range of topics including structural, functional, electrophysiological, biochemical, pharmacological, neuroanatomical, neuroendocrine, neurotoxicological, physiological, genetic, and neuropsychological aspects of these disorders. NPAS focuses on patient-oriented research and post mortem studies.

- BDCN-NPAS-0258 Etiology, pathophysiology, diagnosis and treatment of a wide range of disorders, including: schizophrenia and other psychotic disorders, mood disorders, anxiety disorders cognitive disorders, attention disorders, activity disorders, sleep disorders, and personality disorders.
- BDCN-NPAS-0259 Etiology, pathogenesis, pathophysiology, and treatment strategies of substance abuse, and addictive disorders; co-morbidity factors; neurobiological, behavioral and cognitive processes underlying drug-seeking behavior, craving, tolerance, withdrawal, relapse, dependence and sensitization; neurobiological basis of individual differences in vulnerability and resiliency to drug abuse.
- BDCN-NPAS-0260 Genetic basis and models of addictive and mental disorders. Identification and expression of genes or genetic mechanisms associated with addictive and mental disorders or models of these disorders, genomic screening, and linkage analysis

BDCN - *PMDA*

Pathophysiological Basis of Mental Disorders and Addictions - PMDA

Descrizione SS

The PMDA Section addresses the pathophysiology of a broad range of psychiatric, addictive and neurological disorders and the biological systems that mediate cognitive, behavioral, emotional, social and learning abnormalities. The emphasis is on an integrative biological systems understanding of the abnormalities using a wide range of molecular, genetic, biochemical, pharmacological, cellular, behavioral, electrophysiological and neuroanatomical methods.

- BDCN-PMDA-0261 Psychiatric disorders including, schizophrenia, mood, anxiety and post-traumatic stress disorders.
- BDCN-PMDA-0262 Behavioral disorders including phobias, antisocial personality, obsessive-compulsive and attention deficit disorders.
- BDCN-PMDA-0263 Addictive disorders and comorbidities among addictive and other psychiatric disorders.
- BDCN-PMDA-0264 Neurobiology of psychiatric manifestations in neurological disorders and chromosomal abnormalities (e.g., Alzheimer's disease, multiple sclerosis).
- BDCN-PMDA-0265 Models of neuropsychiatric disorders and studies of neurobiological and behavioral deficits that are core features of neuropsychiatric and addictive disorders.
- BDCN-PMDA-0266 Neurobiological and behavioral consequences of allelic variations associated with mental disorders and their investigations in model systems

Descrizione IRG:

The Bioengineering Sciences and Technologies [BST] Group reviews grant applications that focus on fundamental aspects of bioengineering and technology development in the following areas: gene and drug delivery systems, imaging principles for molecules and cells, modeling of biological systems, bioinformatics and computer science, statistics and data management, instrumentation, chips and microarrays, biosensors, and biomaterials. Biological context is important in bioengineering, and a central premise in organization of this Group is the need for effective review of bioengineering and technology development in early stages before specific practical uses are proven.

BST - *BDMA***Biodata Management and Analysis - BDMA****Descrizione SS**

The Biodata Management and Analysis (BDMA) Section reviews grant applications concerned with developing technologies for the management and analysis of biological data. This includes the review of bioinformatics and computational biology applications addressing large-scale data collection and integration efforts. Research grant applications driven by bioengineering principle, design, or validation, but not necessarily driven by hypothesis, are expected.

- BST-BDMA-0283 Computer systems for data management including hardware and software.
- BST-BDMA-0284 Database technologies and methods for data management, data representation, data capture, data integrity and validation, data standards and ontology development,
- BST-BDMA-0285 Methods for data analysis including: Numerical, statistical, mathematical and theoretical approaches to design and interpretation of large-scale studies such as methods for pattern discovery, data mining, sequence prediction, biomarker identification, therapeutic drug design and high throughput analyses; computational methods for organizing, maintaining, and integrating biological datasets and for large scale data modeling and simulations.
- BST-BDMA-0286 Visualization techniques including: Summary, integration, and representation of data in meaningful ways with, for example, graphical, auditory, tactile, and visual methods.

BST - *BMBI***Biomaterials and Biointerfaces - BMBI****Descrizione SS**

The Biomaterials and Biointerfaces Section (BMBI) reviews applications in materials science and the closely allied field of materials surfaces and their interactions with basic biological systems. Applications driven by bioengineering principles and not necessarily driven by hypothesis are typical. The material aspects of biomaterials and surface science concern the design principles and theory and the synthesis, characterization, and optimization of new or existing materials. The biological aspects of biomaterials science concern interactions of materials with proteins, membranes, cells, and tissues.

- BST-BMBI-0278 Development and characterization of biomaterials; Self-assembled materials; Design principles, material processing, and combinatorial approaches to the synthesis of new biomaterials; Biocompatibility, toxicity, structure/property relationships, and biodegradability.
- BST-BMBI-0279 New biomaterials and fabrication techniques for tissue engineering, transport and perfusion aspects of tissue engineering, and bioreactors.
- BST-BMBI-0280 Molecular / cellular interfacial interactions; Non-fouling and bioactive surfaces; Improved understanding of the biology-biomaterials interface; Biosurface characterization and technology; Patterning; Surface characterization at the nano-scale.
- BST-BMBI-0281 Chip- and micro-array-based microtechnologies and biosensors, with a focus on biorecognition, biocompatibility, nonfouling surfaces, and fouling mechanisms; Includes MEMS (micro-electro-mechanical-systems), lithographic and microfluidic elements.
- BST-BMBI-0282 Drug and gene delivery systems and nanoparticles, with a focus on the carrier material, fabrication, biocompatibility, and toxicity.

Descrizione SS

The Gene and Drug Delivery Systems (GDD) Section considers grant applications focused on the development and delivery of drugs, genes, and gene products that alter gene function or expression in the living organism. Research grant applications driven by bioengineering principle, design, or validation, but not necessarily driven by hypothesis, are expected.

- BST-GDD-0273 Delivery of nucleic acids, peptide/protein complexes, vaccines, genes, small molecules, antibiotics and other drugs and biomaterials.
- BST-GDD-0274 Delivery vehicles including viruses, liposomes, vesicles, nanoparticles, biomaterials, and cells.
- BST-GDD-0275 Delivery strategies including electroporation, ultrasound, light, and ballistic methods.
- BST-GDD-0276 Study of the physiological barriers to delivery (e.g., membrane, tissue, cellular, trafficking, physical).
- BST-GDD-0277 Studies of the interactions of delivery vehicles, devices, and/or payloads with the immune system.

Descrizione SS

The Instrumentation and Systems Development Section (ISD) considers research applications seeking to design and develop instrumentation and systems for biological research. Applications driven by mathematical and bioengineering principles and by biological utility but not necessarily driven by hypothesis are typical.

- BST-ISD-0267 Analytical instrumentation: novel methods for improving throughput in analytical techniques; optical methods; chemical methods; spectroscopy; microfluidics; hardware and computer systems.
- BST-ISD-0268 Sensing devices: detection and sensing of single cells; biomarkers; environmental and toxic chemicals; biomedically relevant compounds and molecules; pre-clinical "lab-on-a-chip" sensing technology.
- BST-ISD-0269 Separation technologies: improvements and variations to classical techniques such as electrophoresis and chromatography; cell separations; microfluidics; nanotechnology.
- BST-ISD-0270 Automation and integration: design and development of both individual instrumentation modules and integrated systems for biological research or diagnostics.
- BST-ISD-0271 Micro/nanofabrication: Microfabricated and/or nanostructured devices and systems for use in biological research or diagnostics.
- BST-ISD-0272 Development of high throughput assay systems.

Descrizione SS

The Modeling and Analysis of Biological Systems Section (MABS) reviews applications concerned with the development of modeling/enabling technologies for understanding the complexity of biological systems. The scope of these systems ranges from molecular, to supramolecular, to organelles, to cellular, to tissue and to organ level studies. Applications driven by mathematical and bioengineering principles and by perceived biological utility but not necessarily driven by hypothesis are typical. Tools being developed are characteristically applied to further understanding of interactions and integrations through levels and scales and the emergence of patterns that help to explain system behavior.

- BST-MABS-0287 Modeling methods: computational and analytical approaches for model construction, analysis and verification.
- BST-MABS-0288 Development and adaptation of mathematical methods and models: deterministic and stochastic, Boolean, discrete and continuous; dynamical systems analysis; timescale and spatial decomposition; numerical methods; statistical tools including time series analysis and Bayesian methods.
- BST-MABS-0289 Specific models of important processes: molecular interactions, signal transduction; biochemical networks; gene regulatory networks; metabolic networks; intracellular dynamics; cell structural dynamics; cell communication; tissue physiology; biomechanics; and biofluidics.
- BST-MABS-0290 Integration of modeling and experiment: experimental validation of models; high-throughput data integration; computer simulations of multiscale systems

Descrizione SS

The Microscopic Imaging and Spectroscopy Section (MIS) reviews applications that aim to develop, improve and implement instrumentation, methods, and quantitative techniques for the static and dynamic visualization of molecules, macromolecular machines and complex organelles, cells, and model systems in physiologically active states. Applications driven by mathematical and bioengineering principles and by perceived biological utility but not necessarily driven by hypothesis are typical. Imaging principles, instrumentation, or probes may be developed.

- BST-MIS*-0291 Development and improvement of instrumentation for microscopic imaging and microscopic spectroscopy, including optical, near-field, vibrational and Raman, electron, and transmission (soft) X-ray. Also included are automated and remote access microscopy methods.
- BST-MIS*-0292 Development of sub-cellular and cellular imaging probes, including those for optical, electron, and NMR microscopies.
- BST-MIS*-0293 Image acquisition and analysis, including validation of image formation theory, light propagation and scattering analysis, algorithm development, tomographic and single particle reconstruction (cryo-EM), visualization of multi-dimensional information, and high-throughput, automatic data processing at the sub-cellular and cellular level.
- BST-MIS*-0294 Data mining techniques, including integration of information derived from complementary imaging techniques and bioinformatics to derive functional mechanisms

Descrizione SS

The Nanotechnology Section (NANO) reviews applications focused on fundamental aspects of bioengineering and technology development based on the unique properties of materials at the nanometer scale. Nanotechnology draws from the disciplines of physics, chemistry, materials science, and bioengineering. Applications driven by mathematical and bioengineering principles and by perceived biological utility but not necessarily driven by hypothesis are typical. A premise is that basic research and early technology development, prior to specific practical use will be reviewed.

- BST-NANO-0295 Studies of the unique properties of materials at the nanoscale.
- BST-NANO-0296 Design, synthesis, and development of nanostructures, nanodevices, and nanosystems.
- BST-NANO-0297 Nanotechnology based research in complex biological/medical problems.
- BST-NANO-0298 Nanotechnology in cellular imaging, sensing, and drug/gene delivery.
- BST-NANO-0299 Biocompatibility and toxicities associated with nanomaterials.

Descrizione IRG:

The Cell Biology [CB] Group will review research applications that focus broadly on the study of fundamental cell biological processes, including the functions, interactions and regulation of cells and cellular organelles. This Group will review applications that involve a variety of disciplines including biochemistry, biophysics, chemistry, and genetics, and use a variety of techniques including microscopy, genomics, proteomics and computational techniques, with the primary goal of better understanding cell functions. In addition, the Biology and Diseases of the Posterior Eye [BDPE] study section is in this group.

Topics to be covered include cell growth, proliferation, and cell cycle control; nuclear architecture and transport; RNA trafficking and localization; post-translational modifications, protein processing, glycosylation and folding; membrane structure and function; lipid traffic and metabolism; cell asymmetry and polarity; ion transport and regulation, channels, transporters and junctions; organelle biogenesis, function, dynamics and protein translocation; the secretory pathway, endocytosis, exocytosis and phagocytosis; degradative processes; cell adhesion, junctions and cell: cell fusion; extracellular matrix and ECM receptors; signaling mechanisms and networks; integrative cell physiology including circadian clocks, stress and oxidative damage response; motors, filaments and cargoes; cell locomotion; mitosis and meiosis; programmed cell death and apoptosis; multi-cellular interactions and development including higher order complexity in tissues; cell differentiation and oncogenic transformation; and the development of new methodologies including advances in imaging and biosensors.

CB - BDPE**Biology and Diseases of the Posterior Eye - BDPE****Descrizione SS**

The Biology and Diseases of the Posterior Eye (BDPE) Section reviews applications focused on the development, structure, function, and diseases of the retina and posterior portion of the eye.

- | | |
|--------------|--|
| CB-BDPE-0300 | Basic research focused on the neural retina, retinal pigmented epithelium, choroid, and retinal blood vasculature: anatomy, physiology, biochemistry, biophysics, pharmacology, genetics, and cell and molecular biology. |
| CB-BDPE-0301 | Phototransduction processes and adaptation mechanisms in rod and cone photoreceptors. |
| CB-BDPE-0302 | Photoreceptor outer segment renewal. |
| CB-BDPE-0303 | Retinal circuitry and the interconnections between different classes of retinal neurons that mediate visual information processing. |
| CB-BDPE-0304 | The function of retinal glial cells. |
| CB-BDPE-0305 | Basic and clinical research for the study of retinal degenerative and neovascular diseases such as Retinitis Pigmentosa, Age-Related Macular Degeneration, Diabetic Retinopathy, Retinopathy of Prematurity, etc. in animal models and patients. |
| CB-BDPE-0306 | Applications of imaging techniques and visual function testing for the study of the retina and its diseases in animal models and patients |

Descrizione SS

The Cellular Signaling and Regulatory Systems (CSRS) Section reviews applications that focus on the initiation and execution of programs that control cellular homeostasis and physiology. A distinguishing characteristic of these applications is an emphasis on signaling networks and the coordination of processes related to cell proliferation, survival, and growth.

- CB-CSRS-0313 Cell cycle regulation, mitosis, meiosis, checkpoint controls and regulation by ubiquitination.
- CB-CSRS-0314 Proteolytic mechanisms associated with cell cycle, senescence and death.
- CB-CSRS-0315 Programmed cell death and apoptosis, particularly their regulation in the context of stress, growth, and transformation.
- CB-CSRS-0316 Proliferation and growth control by the nucleus; signaling pathways regulating transcription.
- CB-CSRS-0317 Integrative cell physiology, e.g., stress, clocks, cellular modeling; cell differentiation and transformation.
- CB-CSRS-0318 Basic studies of cytokine signaling.
- CB-CSRS-0319 Application of state-of-the-art technologies such as imaging and computational modeling of cellular signaling networks

CB- *ICI***Intercellular Interactions - ICI****Descrizione SS**

The Intercellular Interactions [ICI] Section reviews applications concerned with processes associated with cell growth, proliferation, differentiation and higher order complexity in tissues and in development. Overall, emphasis is placed on how cells interact with both their environment and with neighboring cells in human and animal model systems.

- CB-ICI-0320 Cell migration, cell adhesion, cell organization and morphogenesis as related to tissue organization and development including stems cells and tumor cells.
- CB-ICI-0321 Crosstalk between adhesion receptors, flow of extracellular signals between distinct cells types and cell populations, signaling and mechanotransduction pathways and regulated proteolysis at the cell surface.
- CB-ICI-0322 Carbohydrates and proteoglycans in cell-cell adhesive structures, in signal transduction, in development and in pathogenesis and immunity.
- CB-ICI-0323 Cell surface adhesive structures in relation to the cytoskeleton, cell polarity and cell proliferation, differentiation and survival.
- CB-ICI-0324 Biology of the Extra Cellular Matrix (ECM).
- CB-ICI-0325 Intercellular communication: Regulation, assembly and function of channels, transporters and gap junctions

CB- *MBPP***Membrane Biology and Protein Processing - MBPP****Descrizione SS**

The Membrane Biology and Protein Processing [MBPP] Section reviews applications primarily concerned with protein synthesis, processing, maturation, targeting and degradation as well as membrane structure, function and trafficking. These topics are investigated using cell biological, molecular, biochemical, morphologic, electrophysiological and structural approaches and employing various model systems including yeast, flies, worms, plants, cultured cells and mice.

- CB-MBPP-0326 Molecular regulation of vesicle-mediated trafficking along the secretory and endocytic pathways with an emphasis on the mechanisms of cargo sorting as well as vesicle formation, targeting and fusion
- CB-MBPP-0327 Regulation, functions and mechanisms of the ubiquitin/proteasome system
- CB-MBPP-0328 Mechanisms and regulation of protein synthesis, processing, folding (chaperones), quality control (ERAD), targeting, and degradation
- CB-MBPP-0329 Post-translational modifications with an emphasis on glycosylation, ubiquitination, lipidation and phosphorylation
- CB-MBPP-0330 Membrane biogenesis, structure, and function, with an emphasis on the organization and interactions of proteins, carbohydrates, and lipids in cell membranes; metabolism and trafficking of lipids; and function of lipid domains

- CB-MBPP-0331 Organelle biogenesis, structure, function and dynamics with an emphasis on chloroplasts, mitochondria and peroxisomes
- CB-MBPP-0332 Transport of small molecules across membranes via channels, transporters and gap junctions

CB- *MIST* **Molecular and Integrative Signal Transduction - MIST**

Descrizione SS

MIST reviews focus on basic molecular mechanisms of cellular signaling. The applications are on the biochemical and structural mechanisms of signal transduction, including G-proteins, seven-transmembrane protein (7TM) coupled receptors, and their regulation. MIST also reviews the associated kinases, phosphatases and lipid signaling mechanisms and cross-talk with other pathways. Integrative studies may involve a variety of organisms that advance the field whether uni- or multi-cellular, bacterial or mammalian.

- CB-MIST-0333 Biochemical and structural mechanisms of receptor signal transduction, including G-proteins and 7TM receptors.
- CB-MIST-0334 Protein-protein interactions among signaling molecules.
- CB-MIST-0335 Serine and tyrosine protein kinases associated with signal transduction mechanisms.
- CB-MIST-0336 Protein phosphatases associated with signal transduction mechanisms.
- CB-MIST-0337 Second messengers including lipid signaling molecules.
- CB-MIST-0338 Related metabolic studies including drugs and inhibitors.
- CB-MIST-0339 Regulatory mechanisms controlling signaling including regulator of G-protein signaling (RGS) proteins.
- CB-MIST-0340 Calcium signaling mechanisms including structure/regulation of calcium channels and cellular organization of calcium signals.
- CB-MIST-0341 Computer simulations and modeling of signaling complexes and pathway components

CB- *NCSD* **Nuclear and Cytoplasmic Structure/Function and Dynamics - NCSD**

Descrizione SS

The Nuclear and Cytoplasmic Structure/Function and Dynamics Section is a new Section which will cover scientific areas previously assigned to the Cell Structure Function (CSF) and Nuclear Dynamics and Transport (NDT) Sections. The NCSD Section will review applications that focus broadly on elucidating basic molecular mechanisms of cells and tissues. These applications emphasize nuclear architecture, cytoskeletal dynamics, membrane traffic, organelle biogenesis, cell and organelle motility, exocytosis, endocytosis, and intercellular targeting of proteins. These topics are investigated using cell biological, biophysical, molecular, biochemical, morphologic and structural approaches and employing various model systems including bacteria, yeast, flies, worms, plants, cultured cells and mice.

- CB-NCSD-0307 Cytoskeletal and nuclear dynamics; functional and biophysical studies of actin and microtubule filaments, motors and cargos, and specialized structures including cilia and flagella
- CB-NCSD-0308 Nuclear architecture and chromatin structure function, including nuclear matrix components, nuclear envelope, nucleoli, subnuclear organelles, lamins, telomeres and centromeres
- CB-NCSD-0309 Organelle biogenesis (for example mitochondria, chloroplasts, peroxisomes and lysosomes/vacuoles, Golgi), including organelle maintenance, proliferation, segregation, and dynamics
- CB-NCSD-0310 Cellular trafficking and nuclear transport, targeting, translocation, and processing of newly synthesized proteins and vesicular cargos
- CB-NCSD-0311 Chromosome movement, spindle structure and dynamics, cytokinesis
- CB-NCSD-0312 Mechanical properties and forces of cells, cell motility, and cell adhesion, extracellular matrix interactions with the cytoskeleton, adhesions, and membrane trafficking components

CB- *SEPR* **Retinopathy Special Emphasis Panel (SEPR)**

Descrizione SS

The Retinopathy Special Emphasis Panel (SEPR) reviews (non other area) applications focused on the development, structure, function, and diseases of the retina and posterior portion of the eye, and member conflicts from the Biology and Disease of the Posterior Eye (BDPE) Section.

CB-SEPR-0342	Basic research focused on the neural retina, retinal pigmented epithelium, choroid, and retinal blood vasculature: anatomy, physiology, biochemistry, biophysics, pharmacology, genetics, and cell and molecular biology.
CB-SEPR-0343	Phototransduction processes and adaptation mechanisms in rod and cone photoreceptors.
CB-SEPR-0344	Photoreceptor outer segment renewal.
CB-SEPR-0345	Retinal circuitry and the interconnections between different classes of retinal neurons that mediate visual information processing.
CB-SEPR-0346	The function of retinal glial cells.
CB-SEPR-0347	Basic and clinical research for the study of retinal degenerative and neovascular diseases such as Retinitis Pigmentosa, Age-Related Macular Degeneration, Diabetic Retinopathy, Retinopathy of Prematurity, etc. in animal models and patients.
CB-SEPR-0348	Applications of imaging techniques and visual function testing for the study of the retina and its diseases in animal models and patients

CVRS

CVRS - Cardiovascular and Respiratory Sciences

Descrizione IRG:

The Cardiovascular and Respiratory Sciences [CVRS] Group will consider research applications that employ basic investigations, translational approaches and patient-oriented studies to focus on the development, physiology, and pathophysiology of the cardiac and pulmonary systems. Cardiac study sections are organized around themes of cardiac development, muscle contraction including cardiac hypertrophy and failure, cardiovascular electrophysiology and arrhythmias, myocardial ischemia and metabolism and include a study section devoted to clinical investigation. Respiratory study sections focus on inflammation and immune dysfunctions in the lung, lung injury, repair and remodeling, and the integrative biology and control mechanisms of the lung and its related organs and tissues. Investigators may employ a range of approaches that include genetics, genomics and proteomics, molecular, cell, and computational biology, biochemistry, biophysics and bioengineering, imaging, analyses of model organisms, and human studies.

CVRS - CCHF

Cardiac Contractility, Hypertrophy, and Failure - CCHF

Descrizione SS

The Cardiac Contractility, Hypertrophy, and Failure [CCHF] Section reviews applications that involve basic, applied and translational aspects of heart function, homeostasis and disease. Applications focus on contractile function and dysfunction, including studies of hereditary and acquired cardiac hypertrophy and failure, at levels ranging from molecular assemblies to the intact organ to translation of novel therapies to human.

CVRS-CCHF-0349	The basic molecular and cellular mechanisms underlying cardiac hypertrophy and failure: myocyte growth, proliferation, metabolism and apoptosis; receptor signaling; transcriptional pathways; inflammatory/ cytokine-mediated processes.
CVRS-CCHF-0350	Systolic and diastolic function/dysfunction: adaptation to abnormal hemodynamic load and ventricular mechanics; mechanical signal transduction; stress-strain relationships; effects of therapeutic interventions such as pacing, ventricular assist devices and others; valvular heart disease.
CVRS-CCHF-0351	Myocardial remodeling and fibrosis: extracellular matrix reorganization and collagen metabolism; cytoskeleton.
CVRS-CCHF-0352	Cardiac myocyte contractile function: sarcomeric proteins; calcium regulation and signaling; calcium-force relationship; arrhythmia-related causes of remodeling and heart failure.

- CVRS-CCHF-0353 Cardiac repair: cell-based and gene therapy as it relates to contractility and remodeling; capillary density; changes in ventricular and cellular function that result from heart transplantation.
- CVRS-CCHF-0354 Genetic cardiomyopathies; genotype-phenotype correlation; genomic and proteomic approaches to cardiac hypertrophy and failure.

CVRS- **CDD** **Cardiovascular Differentiation and Development - CDD**

Descrizione SS The Cardiovascular Differentiation and Development [CDD] Section reviews applications related to development and differentiation of heart, vascular and lymphatic system. A wide variety of technologies are encouraged including human genetics, as well as cellular, molecular, genetic, genomic/proteomic and transgenic approaches in different model organisms such as mouse, chick, zebrafish, xenopus and drosophila.

- CVRS-CDD-0355 Cardiac development: commitment and differentiation of cardiac cell phenotypes; looping morphogenesis; cardiac chamber specification; valvulogenesis; epicardial and coronary vessel development; neural crest in developing heart and great vessels; cardiac conduction system; embryonic cell processes, cellular signaling and transcriptional regulation in heart development.
- CVRS-CDD-0356 Vascular development: origin, commitment and differentiation of endothelial and smooth muscle cell populations; vasculogenesis and angiogenesis; patterning and organization of the vascular system; vascular remodeling in the postnatal organism; neovascularization in adults recapitulating embryonic and fetal processes.
- CVRS-CDD-0357 Lymphatic development: differentiation, development and organization of the lymphatic vascular system; molecular and cellular mechanisms of lymphangiogenesis; lymphedema.
- CVRS-CDD-0358 Stem cells: differentiation of embryonic and adult stem cells into cardiomyocytes, endothelium, smooth muscle and other components of the cardiovascular system; resident stem cells in regeneration and repair of myocardium and vasculature in vivo.
- CVRS-CDD-0359 Human genetics of cardiac and vascular malformations; studies related to human congenital defects of cardiovascular system, modeling of human developmental cardiovascular diseases in different organisms

CVRS- **CICS** **Clinical and Integrative Cardiovascular Sciences - CICS**

Descrizione SS The Clinical and Integrative Cardiovascular Sciences [CICS] Section considers patient oriented research involving the cardiovascular system and related regulatory organ systems. Patient oriented research is defined as studies involving investigation of the cardiovascular system of humans, including autonomic physiology and exercise cardiovascular studies and extending to include surgery and pediatrics. Clinical trials that are secondary prevention focusing on outcomes may be assigned to CICS. Applications for randomized multi-center clinical trials are not appropriate for CICS.

- CVRS-CICS-0360 Human clinical studies (and appropriate translational animal studies): including pediatric populations, mechanisms and consequences of disease: Investigations may include: coronary physiology and pharmacology, cardiac electrophysiology, regional circulations, hemodynamic studies, cardiac mechanics, and genetic considerations in cardiovascular studies. Disease states can include: cardiac or vascular ischemia, hypertension, diabetes, thyroid disease, atherosclerosis, general inflammation, or hypercholesterolemia.
- CVRS-CICS-0361 Modulation of cardiac/cardiovascular responses and adaptations: influence of acute and chronic exercise on metabolic function and cardiac, vascular smooth muscle, and vascular endothelial function(s). Pregnancy and aging may be considered modulatory influences.
- CVRS-CICS-0362 Neural control of the cardiovascular system: includes healthy and diseased populations and central and peripheral autonomic physiology, pharmacology, and receptor mechanisms.
- CVRS-CICS-0363 Clinical, population, or translational studies of the responses of the cardiovascular system to trauma or surgery: arrhythmias associated with cardiac surgery or cardiopulmonary bypass, cardiac sudden death, resuscitation, stenting, pacemakers, cardiovascular injury and repair, and myocardial ischemia/reperfusion injury.
- CVRS-CICS-0364 Environmental stresses and modifying conditions/stimuli: smoking, altitude, microgravity, heat, cold, bed rest/deconditioning, and environmental pollution in patients

Descrizione SS

The Electrical Signaling, Ion Transport and Arrhythmias Section reviews both basic and clinical applications concerned with cardiac and vascular electrical and mechanical activity, excitation-contraction coupling, electrophysiological aspects of normal and abnormal cardiovascular function, arrhythmias and sudden death. Studies involve humans and animals, in vitro and in vivo systems, molecular, genetic, electrophysiological, biochemical, biophysical, bioengineering, and computational approaches. Emphasis is on ion transfer and transport mechanisms affecting cardiac rhythm disorders, impulse propagation, and cardiac and vascular smooth muscle contractility in hypertrophy, heart failure, ischemia, hypertension, congenital heart disease, and heart transplant.

- CVRS-ESTA-0365 Excitability, electrical propagation and repolarization in normal and diseased hearts, structure function of cardiac and vascular ion channels, ion exchangers, ion pump, connexins, excitation-contraction coupling proteins, basis of propagation, conduction system, and intercellular communication.
- CVRS-ESTA-0366 Mediators and modulators of cardiac contractility, calcium homeostasis, calcium regulation, calcium sensitive proteins, neural regulation, redox regulation, genes and proteins that modulate cardiac excitability and contractility, regulation of ion channel function and expression.
- CVRS-ESTA-0367 Cellular mechanisms of arrhythmogenesis, identification of genes and proteins, electrophysiological consequences of acquired heart diseases (e.g. ischemia, hypertension, heart failure, hypertrophy etc.).
- CVRS-ESTA-0368 Computational techniques to predict arrhythmias, mathematical modeling of ion channels, myocytes, multi-cellular tissue and the whole heart, development and evaluation of interventions and devices to diagnose and treat cardiac rhythm disorders

CVRS - *LCMI***Lung Cellular, Molecular, And Immunobiology - LCMI****Descrizione SS**

The Lung Cellular, Molecular, and Immunobiology [LCMI] Section reviews grant applications designed to study the genetic, molecular, and cellular basis of normal respiratory biology, and the alterations in these processes in inflammatory and immune lung disorders. The Section will consider applications using molecules, cells, tissues, organs, animal models, and/or human investigations that address the identity, function, and products of the cells that populate the airways, the regulation and dysregulation of innate host defense mechanisms and the adaptive immune system in health and disease as they relate to the respiratory system. Topics may include the inflammatory and immune mechanisms that contribute to the pathogenesis of a variety of airway diseases of the lung, including, but not limited to, Asthma, Cystic Fibrosis, Chronic Obstructive Pulmonary Disease (COPD), and Tuberculosis.

- CVRS-LCMI-0369 Asthma, including: the molecular and cellular mechanisms, pathology and remodeling of airway epithelial cells and airway smooth muscle; cytokine transport and regulation; effects of oxidant and leukotriene products on the airways; T cell secretions and regulation; adrenergic agonists and receptors; and genetic predisposition.
- CVRS-LCMI-0370 Cystic Fibrosis, including molecular mechanisms Cystic Fibrosis Transmembrane Conductance Regulator in airway epithelial cells and bacterial interactions with the airways in Cystic Fibrosis.
- CVRS-LCMI-0371 Airway Epithelial Cell Biology, including regulation of secretion of mucins, control of cilia, and development of goblet cell metaplasia.
- CVRS-LCMI-0372 Host Defense of the lung, including pulmonary interactions and reactions to aspergillus, influenza, pneumonia, pseudomonas, tuberculosis, rhinovirus, Respiratory Syncytial Virus and other pathogens in the lung. Also, involvement of surfactant proteins A and D in lung host defense:
- CVRS-LCMI-0373 Immunology of the lung, including biology, regulation and interactions of alveolar macrophages, T lymphocytes, neutrophils, eosinophils, dendritic cells, mast cells, and B lymphocytes. Also, immunological effects of Lung Transplantation.
- CVRS-LCMI-0374 COPD, including the effects of smoking on airway epithelia cells, and airway epithelia cell remodeling in chronic bronchitis

Descrizione SS

The Lung Injury, Repair, and Remodeling [LIRR] Section reviews applications that focus on lung injury, repair, remodeling, and barrier function in non-vascular pulmonary tissue or cells, and lung development and regeneration. Among the mechanistic processes considered are cellular processes including signal transduction, control of gene expression, cell cycle and cell death mediators, and proteolytic mechanisms. Integrative processes include inflammation, cell trafficking, cell-cell interactions, regulation of extracellular matrix, and effects of blood components such as coagulation factors and complement.

- CVRS-LIRR-0375 Lung injury: Includes, but not limited to lung injury caused by reactive oxygen and nitrogen species, hypoxia, sepsis, mechanical ventilation, alcohol, and environmental and other toxic agents. This would include studies addressing lung epithelium injury, leukocyte contributions to lung injury, normal and abnormal lung permeability, and mechanisms of resolution, repair, and remodeling.
- CVRS-LIRR-0376 Pulmonary fibrosis and interstitial lung diseases: Includes granulomatous diseases (such as sarcoidosis), idiopathic pulmonary fibrosis, interstitial pneumonias, autoimmune lung diseases, and lymphangioleiomyomatosis. This would also include involvement of mesenchymal stem cells, epithelium dysfunction, and epithelial-mesenchymal transition.
- CVRS-LIRR-0377 Lung fluid balance: Includes epithelial (ion channels, aquaporins, etc.), interstitium, and lymphatic function and pulmonary edema, when not primarily restricted to the pulmonary vasculature.
- CVRS-LIRR-0378 Pleural diseases: Includes infections, dysplasias, hyperplasias, and other non-malignant proliferative disorders and inflammatory processes.
- CVRS-LIRR-0379 Lung development and maturation: Includes mechanisms of normal and abnormal lung development, differentiation, and neonatal and pediatric lung syndromes and diseases (e.g. meconium aspiration syndrome and bronchopulmonary dysplasia).
- CVRS-LIRR-0380 Stem cells: Includes stem cell biology in the context of lung development and repair/regeneration. This includes isolation and characterization of lung progenitor cells, development of in vitro culture systems that allow expansion of lung progenitor cells and differentiation of embryonic stem cells and adult stem cells into lung epithelium, endothelium, and other components of the respiratory system, tissue engineering, and stem cell based therapy.
- CVRS-LIRR-0381 Pulmonary surfactant: Includes expression and post-translational processing and trafficking of surfactant proteins A, B, C and D in lung epithelium, surfactant lipids, lung diseases associated with surfactant dysfunction and/or deficiency, and surfactant replacement therapy.
- CVRS-LIRR-0382 Environmental and occupational lung diseases and inhalation and respiratory toxicology

Descrizione SS

The Myocardial Ischemia and Metabolism [MIM] Section reviews applications involving basic and applied aspects of myocardial ischemia/reperfusion, coronary circulation, and myocardial metabolism. It includes the review of studies using molecular, genetic, cellular, biochemical, pharmacological, genomic, proteomic, and physiological approaches to define normal and pathological processes. MIM examines investigations at all levels of organization, ranging from in vitro models of simulated ischemia in isolated cells to whole animal models.

- CVRS-MIM-0383 Mechanisms of ischemia/reperfusion tissue injury, myocardial stunning, infarction, and hibernation.
- CVRS-MIM-0384 Cardioprotection, cardiac repair and regeneration including stem cell therapy.
- CVRS-MIM-0385 Control of coronary blood flow in health and disease; post-ischemic coronary vascular abnormalities; development of collateral circulation in response to myocardial ischemia.
- CVRS-MIM-0386 Signal transduction mechanisms of myocardial ischemia/reperfusion injury, preconditioning, and inflammation, including changes in receptor function, kinase activity, and transcription factor activity.
- CVRS-MIM-0387 Role of reactive oxygen species, nitric oxide and other reactive nitrogen species, cytokines, chemokines, and white blood cells in myocardial ischemia/reperfusion injury.
- CVRS-MIM-0388 Metabolism and energetics in normal myocardium and in acquired heart disease: carbohydrate and lipid metabolism, glycolysis, oxidative phosphorylation, substrate interaction, regulation of substrate transport and fluxes, and mitochondrial function

Physiology and Pathobiology of Cardiovascular and Respiratory Systems - PPCR

Descrizione SS

PPCR Section reviews fellowship applications for basic and clinical aspects of respiratory and cardiovascular systems, including hematology. Approaches include clinical studies, animal models of disease, and in vitro studies of the physiology of these organ systems and of their function in health or disease.

- CVRS-PPCR-0404 Organ system physiology and pathobiology including genetic and molecular biological approaches in these organs.
- CVRS-PPCR-0405 Experimental models, clinical studies and studies on mechanisms of disease states including exercise physiology as related to cardiac and pulmonary metabolism, oxygen, contractility, and respiratory function and regulation
- CVRS-PPCR-0406 Toxicology
- CVRS-PPCR-0407 Neural control of circulation and respiration
- CVRS-PPCR-0408 Angiogenesis and hemostasis (platelets and coagulation), hematopoiesis and leukogenesis
- CVRS-PPCR-0409 Lipoprotein metabolism in the context of coronary artery diseases, vessel wall biology, and pathogenesis of atherosclerosis.
- CVRS-PPCR-0410 Effects of immune processes and infection on target tissue physiology

Physiology and Pathobiology of Musculoskeletal, Oral, and Skin Systems - PPMO

Descrizione SS

PPMO reviews fellowship applications for basic and clinical aspects of musculoskeletal, oral, and skin sciences. Approaches include clinical studies, animal models of disease, and in vitro studies of the physiology of these organ systems and of their function in health or disease.

- CVRS-PPMO-0411 Organ system physiology and pathobiology studies that utilize genetic and molecular biological approaches.
- CVRS-PPMO-0412 Experimental models, clinical studies and studies on the mechanisms of disease states including biomechanics and exercise physiology involving musculoskeletal systems
- CVRS-PPMO-0413 Toxicology related to musculoskeletal, oral, and skin system
- CVRS-PPMO-0414 Underlying pathophysiology of muscle physiology addressing the role of actin and myosin and other factors in skeletal muscle contractility.
- CVRS-PPMO-0415 Effects of immune processes and infection on target tissue physiology.

Respiratory Integrative Biology and Translational Research - RIBT

Descrizione SS

The Respiratory Integrative Biology and Translational Research [RIBT] Section reviews applications that deal with pulmonary vascular physiology; neural control of breathing; respiratory biophysics, biomechanics, imaging, and transport; sleep apnea in relation to upper airways and respiratory control; clinical studies of lung disease; and studies linking genetic and physiologic aspects of lung disease. Methods may include molecular and cellular approaches, normal and genetically modified animal models, human subjects and mathematical modeling. Emphasis is often on physiologic and integrative approaches.

- CVRS-RIBT-0389 Aspects of pulmonary vascular biology and disease including pulmonary hypertension, angiogenesis, normal and abnormal endothelial and vascular smooth muscle cell biology, mechanisms of vasoreactivity, barrier function of the vascular cells in relation to lung fluid balance, and the involvement of reactive oxygen and nitrogen species as well as hypoxia in these processes.
- CVRS-RIBT-0390 Neural control of breathing including central and peripheral chemoreceptors, central neural processes, airway receptors, and neural aspects of dyspnea.
- CVRS-RIBT-0391 Respiratory biophysics, biomechanics, and imaging of the lung and chest wall, including mechanical ventilation, various imaging techniques, aerosol inhalation, and gas transport.
- CVRS-RIBT-0392 Upper airway physiology and control of respiration in relation to normal and abnormal breathing during sleep (e.g., SIDS, sleep apnea).
- CVRS-RIBT-0393 Human subjects studies related to normal and abnormal pulmonary physiology including phase 1 and 2 clinical trials as well as single site phase 3 trials; genetic studies linked to the physiology of lung disease.

Descrizione SS

The Cardiovascular Sciences Small Business Activities [SECS] reviews small business grant applications related to the general areas of cardiac and circulatory system diagnostics, devices and therapies. Projects are included at all levels of organization ranging from in vitro cell and tissue model systems through whole organisms. The stages of product development included range from the basic design/development stage through the clinical research stage.

- CVRS-SECS-0394 Cardiology, cardiac function, heart failure, myocardial ischemia, reperfusion injury, stents, thrombosis/thrombolysis, imaging, monitoring systems
- CVRS-SECS-0395 Electrophysiology, arrhythmias, sudden death, pacing, arrhythmia ablation
- CVRS-SECS-0396 Cardiac and vascular surgery
- CVRS-SECS-0397 Cell therapy and novel approaches to tissue repair/regeneration
- CVRS-SECS-0398 Emergency medicine, laboratory medicine, clinical chemistry, biomarkers, resuscitation
- CVRS-SECS-0399 Lipid disorders, atherosclerosis
- CVRS-SECS-0400 Biomedical and tissue engineering, biomaterials
- CVRS-SECS-0401 Hypertension
- CVRS-SECS-0402 Gene therapy and gene delivery systems
- CVRS-SECS-0403 Physiology, pharmacology, biochemistry, cell and molecular biology, proteomics

Descrizione SS

The Respiratory Sciences Small Business Activities [ZRRS] section reviews Small Business Innovation Research (SBIR) and Small Business Technology Transfer Research (STTR) grant applications involving diagnostics, medical devices and therapeutics that are focused on the entire pulmonary system and related organs and processes and using approaches ranging from molecular level to organ to human investigations. This would include studies on the chest wall, upper and lower airways, parenchyma, pleural surfaces, and cells affected by and operative in these processes.

- CVRS-ZRRS-0416 Lung function, inflammation, immune dysfunctions.
- CVRS-ZRRS-0417 Lung injury, repair and remodeling resulting from genetic, environmental, developmental, and toxic agents.
- CVRS-ZRRS-0418 Integrative biology of the lung, including biophysics, biomechanics, gas exchange, and the various control processes.
- CVRS-ZRRS-0419 Respiratory diseases and syndromes, including, but not limited to pulmonary fibrosis and interstitial lung diseases, asthma, Chronic obstructive pulmonary disease (COPD), cystic fibrosis, pulmonary hypertension, bronchopulmonary dysplasia, acute respiratory distress syndrome (ARDS), sleep breathing disorders, and dysplasia and hyperplasia derived from environmental or occupational lung exposure.
- CVRS-ZRRS-0420 Lung preservation, transplantation, ischemia reperfusion injury.
- CVRS-ZRRS-0421 Surfactant preparations and therapy.
- CVRS-ZRRS-0422 Embryonic or adult stem cell-based therapy, lung tissue engineering.
- CVRS-ZRRS-0423 Gene or drug delivery technologies.
- CVRS-ZRRS-0424 Inhalers' characterization and aerosol formulation.
- CVRS-ZRRS-0425 Artificial lung, mechanical ventilators.
- CVRS-ZRRS-0426 Imaging-guided biopsy, diagnosis, monitoring and therapy.
- CVRS-ZRRS-0427 Computer-assisted diagnosis and therapy, and remote medical diagnosis.
- CVRS-ZRRS-0428 Health education or training directed to the respiratory system health care provider

Descrizione IRG:

The Digestive, Kidney and Urological Systems (DKUS) Group will review applications on basic and clinical aspects of gastrointestinal, hepatobiliary, pancreatic, kidney, urinary tract and male genital system physiology and pathobiology, as well as the disposition and action of nutrients and xenobiotics. In addition, the DKUS Group will review applications aimed at development and evaluation of new techniques, therapies and treatments related to the disorders of the GI tract, hepatobiliary, pancreas, kidney, urinary tract, and male genital system. Investigators may employ a broad range of basic and clinical research methods including pharmacologic, chemical and biochemical approaches, genetics, genomics and proteomics, molecular and cell biology techniques and animal models. Patient-oriented studies including pediatric gastroenterology, renal, urinary and male genital system are included in this Group, but large population studies and randomized clinical trials involving digestive disorders, kidney, urinary and male genital systems will be reviewed elsewhere.

DKUS- *CIMG***Clinical, Integrative and Molecular Gastroenterology - CIMG****Descrizione SS**

The Clinical, Integrative and Molecular Gastroenterology [CIMG] Section reviews applications concerned with molecular, integrative and clinically-oriented research related to the gastrointestinal (GI) system, including GI development and growth/differentiation control, GI dysplasia and pre-neoplasia, motility, brain-gut interactions, enteric nervous system, motor disorders, acid secretion and acid related disease, GI hormones, pancreatic function and dysfunction, GI system nutrient absorption, malabsorption/malnutrition, nutritional support, integrative GI physiology, genetic determinants of digestive diseases and GI system patient-oriented research.

- DKUS-CIMG-0429 GI development and growth/differentiation control, GI stem cell biology, regulation of mechanisms of gene expression in the GI tract, GI dysplasia and pre-neoplasia, including mechanisms of transformation, immortalization, and mutagenesis.
- DKUS-CIMG-0430 GI motility, neurotransmitters, brain-gut interactions, enteric nervous system. GI hormones, transmitters, and their actions. Acid secretion and acid related disease. Fluid and electrolyte transport, diarrhea and constipation. Digestive system nutrient absorption and disposition, malabsorption/ malnutrition.
- DKUS-CIMG-0431 Exocrine pancreas function and dysfunction, therapy for genetic and acquired pancreatitis.
- DKUS-CIMG-0432 Integrative GI physiology: Studies ranging from normal physiology to mechanisms and consequences of disease. Genetic determinants of digestive diseases, including increased risk of disorders of the digestive tract, inherited metabolic disorders, gene-gene interactions, genetic risk assessment, gene-environment interactions, structure/function analysis of disease-causing genes, and gene and somatic cell therapy.
- DKUS-CIMG-0433 Patient-oriented research. Studies of risk factors, etiology, detection, screening, modifying factors and therapy of GI diseases and disorders. Clinical, population and integrative studies of the responses of the digestive system to trauma or surgery, and digestive system ischemia/reperfusion injury.

DKUS- *CMBK***Cellular and Molecular Biology of the Kidney - CMBK****Descrizione SS**

The Cellular and Molecular Biology of the Kidney [CMBK] Section reviews grant applications involving basic and applied aspects of normal and abnormal renal physiology, cell biology, transport biology, including osmoregulation and osmosensing, hormone action and signal transduction, vascular biology, genetic disorders, cell-matrix interactions, biophysics, and bioenergetics.

- DKUS-CMBK-0434 Molecular biology and physiology of transport relevant to renal function and disease including inherited abnormalities and the pharmacology of kidney function.
- DKUS-CMBK-0435 Protein metabolism and cell polarity relevant to the function of the kidney.
- DKUS-CMBK-0436 Disorders of tubular epithelial and endothelial cells as they relate to kidney diseases.
- DKUS-CMBK-0437 Identification and characterization of genes that cause kidney diseases in humans and animal models. Including the pathophysiology and cellular and molecular consequences of genetic disorders (including polycystic kidney disease and disorders of tubular function).
- DKUS-CMBK-0438 Integrated aspects of disordered fluid, electrolyte, and acid-base homeostasis resulting from abnormalities in the transport systems; blood pressure and extracellular fluid volume homeostasis causing hypertension

DKUS- *GMPB* **Gastrointestinal Mucosal Pathobiology - GMPB**

Descrizione SS

The Gastrointestinal Mucosal Pathobiology [GMPB] Section reviews applications involving gastrointestinal immunology, host-microbial interactions, intestinal infections, inflammation including inflammatory bowel diseases, and epithelial cell biology as it relates to mucosal defense or repair. Approaches may utilize in vitro systems, animal models, or research involving human samples and systems. Emphasis is on basic and translational approaches to mucosal pathophysiology.

- DKUS-GMPB-0439 GI mucosal immunology including both innate and adaptive immunity.
- DKUS-GMPB-0440 Mechanisms of acute and chronic intestinal inflammation as they relate to pathogenesis. Basic and clinical studies in human inflammatory bowel disease, gluten sensitive enteropathy, auto-immune gastritis, other types of immune-mediated gastrointestinal diseases, necrotizing enterocolitis, and the immune responses to GI infections. Dysplasia and pre-neoplasia as a consequence of chronic GI infection or inflammation (e.g. colitis or H. pylori-induced).
- DKUS-GMPB-0441 Interactions between the microbiota and gastrointestinal mucosa including the effects of pathogenic bacteria (including H. pylori, Salmonella and pathogenic E. coli), commensal bacteria, and probiotics.
- DKUS-GMPB-0442 Gastrointestinal cell biology and barrier function in health and disease.
- DKUS-GMPB-0443 Mechanisms of epithelial injury, repair, regeneration, and adaptation. Regulation of gene expression as it relates to inflammatory and repair processes. Mechanisms of apoptosis and oxidative stress in the GI tract as they relate to inflammatory and repair processes.

DKUS- *HBPP* **Hepatobiliary Pathophysiology - HBPP**

Descrizione SS

The Hepatobiliary Pathophysiology [HBPP] Section reviews applications involving pathophysiology and treatment of inherited and acquired viral and non viral hepatobiliary diseases; molecular biology of liver function under physiologic and pathophysiologic states; mechanisms of liver injury, repair, regeneration, and transplantation; liver cell biology, immunology and inflammation; cholesterol and bile salt metabolism; hepatobiliary transporters, hepatic protein metabolism, ion channels; and alcohol metabolism and disease.

- DKUS-HBPP-0444 The use of isolated parenchymal and non-parenchymal cells of the liver as they relate to the pathogenesis of liver disease and progenitor cell therapy of genetic and acquired hepatobiliary diseases. Genetic basis of liver diseases.
- DKUS-HBPP-0445 Mechanisms of bile formation, bile salt synthesis and cholestasis; mechanisms of hepatic cholesterol and lipid metabolism and regulation of lipoprotein genes; physiologic mechanisms of hepatobiliary transport and hepatic protein metabolism.
- DKUS-HBPP-0446 Inflammatory response of the liver to injury or infection and mechanism of hepatocyte injury including immune response, oxidative stress, apoptosis, pro- and anti-inflammatory mediators. Signal transduction pathways and neuromediators.
- DKUS-HBPP-0447 Liver injury, repair, regeneration, growth, differentiation, development, aging, and transplantation; Liver dysplasia and pre-neoplasia, mechanisms of transformation; immortalization and mutagenesis; Liver ischemia-reperfusion injury and regulation of splanchnic blood flow as it pertains to mechanisms of portal hypertension.
- DKUS-HBPP-0448 Cellular and molecular mechanisms, gene regulation, pathogenesis, and treatment of liver diseases, such as, fibrosis and cirrhosis; cholangiopathies; gallstones and gallbladder disease; viral hepatitis as it relates to the pathogenesis of hepatobiliary disease; non-alcoholic fatty liver and alcoholic liver diseases.

Descrizione SS

The Pathobiology of Kidney Disease [PBKD] Section reviews grant applications involving basic and clinical studies of kidney disease, investigations of pathophysiology, diagnosis, consequences and treatment of acute and chronic disorders of the kidney, the consequences of kidney disease and failure, as well as, studies of the normal structure and function of the glomerulus.

- DKUS-PBKD-0449 Normal structure and function of the glomerulus and its constituent cells; glomerular-related diseases, and renal fibrosis
- DKUS-PBKD-0450 Mechanisms and consequences of acute kidney injury/acute renal failure and toxic injury to the kidney.
- DKUS-PBKD-0451 Studies on basic and clinical aspects of kidney ablation, chronic allograft nephropathy, allograft rejection/tolerance, and prevention and/or treatment of rejection.
- DKUS-PBKD-0452 Diabetic nephropathy, nephrotic syndrome, proteinuria, complications and management of uremia, and renal replacement therapies.
- DKUS-PBKD-0453 Vascular biology of the kidney and renal hemodynamics; the role of the kidney in the regulation of blood pressure and in the development of hypertension

DKUS - *SBDI***Digestive Sciences Small Business Activities - SBIR/STTR - SBDI****Descrizione SS**

In the Digestive, Kidney and Urological Systems [DKUS] Integrated Review Group, the Digestive Sciences Small Business Activities sector [SBDI] will consider Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] research applications that focus primarily on digestive system diagnostics, devices and therapies, and on the disposition and action of nutrients and xenobiotics. Investigators may employ a range of approaches that include genetics, genomics and proteomics, molecular, cell, and computational biology, biochemistry, biophysics and bioengineering, imaging, analyses of model organisms, and human studies.

- DKUS-SBDI-0464 Digestive Sciences Small Business Activities - SBIR/STTR Special Emphasis Panel - DKUS (10)

DKUS - *SERU***Renal and Urological Sciences Small Business Activities - SERU****Descrizione SS**

In the Digestive, Kidney and Urological Systems [DKUS] IRG, the Renal and Urological Sciences Small Business Activities [SERU] will review Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] grant applications that focus primarily on kidney, urinary tract, and male genital system therapies, devices, and diagnostics. This includes clinical, translational and fundamental studies and investigators may employ a range of approaches that include genetics, genomics and proteomics, molecular, cell, and computational biology, biochemistry, biophysics and bioengineering, imaging, analyses of model organisms, and human studies.

- DKUS-SERU-0465 Development and evaluation of new techniques for investigating, diagnosing and treating disorders of the kidney, urinary tract, and male genital system.
- DKUS-SERU-0466 Development of new techniques and evaluation of the efficacy of dialysis.
- DKUS-SERU-0467 Application of new technologies and methodologies to the diagnosis and treatment of urologic diseases.
- DKUS-SERU-0468 Novel approaches to regeneration and tissue engineering of the kidney, urinary tract and male genital system.
- DKUS-SERU-0469 Clinical assessment of genitourinary diseases including urinary incontinence and pelvic floor dysfunction

Descrizione SS

The Urologic and Kidney Development and Genitourinary Diseases [UKGD] Section reviews applications concerning physiologic and pathophysiologic processes of the lower urinary tract, male reproductive organs, female pelvic floor, urolithiasis, and basic processes underlying upper and lower genitourinary organ development.

- DKUS-UKGD-0459 Function and dysfunction of the bladder, ureter, and urethra or their component tissues. Microbial infection and inflammation in the urinary tract. Urolithiasis.
- DKUS-UKGD-0460 Function and dysfunction of the prostate. Male sexual function: physiology of penile erection, pathophysiology and treatment of erectile dysfunction.
- DKUS-UKGD-0461 Normal and abnormal development of the upper and lower genitourinary tract.
- DKUS-UKGD-0462 Pediatric urological conditions: hydronephrosis and congenital anomalies of the penis, bladder and ureter.
- DKUS-UKGD-0463 Urogynecology: pelvic floor tissues in health and disease

Descrizione SS

The Xenobiotic and Nutrient Disposition and Action [XNDA] Section reviews applications related to the disposition of xenobiotics and supraphysiologic (SP) levels of nutrients, and the study of their mechanisms of action in normal and pathological conditions of the digestive system, kidney and genitourinary system, as well as in multi-organ systems.

- DKUS-XNDA-0454 Gastrointestinal, hepatic, renal, urological or multi-organ disposition and effects of xenobiotics and SP nutrients, including processes of absorption, biotransformation, distribution, toxicity and excretion.
- DKUS-XNDA-0455 Structure-function relationships for enzymes/transporters/receptors involved in SP nutrient and/or xenobiotic disposition and toxic effects.
- DKUS-XNDA-0456 Role of genetics and genomics in disposition and effects of SP nutrients and xenobiotics. Theoretical, mechanistic, and/or integrated studies of kinetics and/or dynamics of SP nutrients and xenobiotics.
- DKUS-XNDA-0457 In vitro and in vivo models that study the molecular basis of gene-environment interactions related to the digestive system, renal, urological or multi-organ systems.
- DKUS-XNDA-0458 Mechanisms of action of xenobiotics and SP nutrients, including toxicological and/or pharmacological effects on the digestive system, renal, urological or multi-organ systems

Descrizione IRG:

The Endocrinology, Metabolism, Nutrition and Reproductive Sciences [EMNR] Group reviews applications addressing molecular, cellular, and higher order hormone-regulated processes in physiology and pathophysiology. EMNR will evaluate applications on basic and clinical aspects of hypothalamic, pituitary, gonadal, thyroid, and adrenal physiology and pathophysiology, diabetes mellitus (including its pathogenesis, complications and treatment), the biology of the pancreatic islet (beta cell), adipocyte biology, obesity (including its causes and treatment), and other metabolic disorders including inborn errors of metabolism and nutrient transport disorders. Also reviewed in this Group are applications addressing the biology of reproduction and the pathobiology of its disorders (including the causes and treatments of infertility); male and female reproductive aging and menopause; obstetrical disorders of implantation, gestation, embryogenesis, and parturition; disorders of fetal and neonatal life; and gynecologic conditions are reviewed in this Group. Studies of the role of nutrition under normal and pathological conditions are also reviewed in this Group. This Group also reviews applications involving integrative physiology and pathophysiology such as neuroendocrinology; humoral actions on the gut, lung and heart; cancers of the endocrine glands; as well as studies related to the effects and mechanisms of action of drugs, biopharmaceuticals, alcohol and toxicants, xenobiotics and endobiotics on reproduction or on endocrine glands. Applications reviewed in this Group may propose a broad range of basic or clinical research methods and techniques, including pharmacologic, chemical and biochemical approaches, genetics, genomics and proteomics, molecular and cell biology techniques, animal models, and patient-oriented studies involving these research topics mentioned above

EMNR - CADO**Cellular Aspects of Diabetes and Obesity - CADO****Descrizione SS**

The Cellular Aspects of Diabetes and Obesity [CADO] Section reviews applications concerned with all aspects of metabolic regulation related to type 1 and type 2 diabetes and diabetes.

- EMNR-CADO-049 Differentiation, development, growth and function of pancreatic islets; beta cell replacement and stem cell biology.
- EMNR-CADO-049 Differentiation and function of adipocytes; structure and function of adipocyte-secreted biologically active molecules; signal transduction mechanisms controlling adipocyte gene expression and cell function.
- EMNR-CADO-049 Insulin biosynthesis, trafficking, and secretion; insulin action; mechanisms of insulin signaling; glucose transport; downstream signaling pathways in insulin action, including the actions of scaffold proteins, phospholipids, kinases, and phosphatases.
- EMNR-CADO-049 Islet hormones and novel factors that coordinate central and peripheral communication of nutrient status.
- EMNR-CADO-049 Genetics of obesity and diabetes; analysis of the functional consequences of specific genetic alterations concerning obesity and/or diabetes

Descrizione SS

The Clinical and Integrative Diabetes and Obesity [CIDO] Section reviews clinical (patient oriented) research applications related to the prevention, pathogenesis and treatment of diabetes and/or obesity.

- EMNR-CIDO-0500 The regulation of glucose, fat, and protein metabolism in the whole body and specific organs (e.g., liver, skeletal muscle, adipose, brain) in the setting of diabetes or obesity. Studies may also involve the effects of substrates on hormone action and cytokines that mediate energy and regulate nutrient homeostasis.
- EMNR-CIDO-0501 Energy expenditure, thermogenesis, physical activity, and exercise in the context of the prevention, pathogenesis or treatment of human obesity or diabetes.
- EMNR-CIDO-0502 Body composition, the mechanisms which regulate it, and the metabolic consequences of distribution patterns of adipose tissue.
- EMNR-CIDO-0503 Prevention and treatment of obesity and diabetes utilizing lifestyle, pharmacologic or surgical interventions.
- EMNR-CIDO-0504 Central nervous system regulation of energy intake, energy expenditure, and nutrient partitioning.
- EMNR-CIDO-0505 Genomic approaches that are designed to address questions regarding physiology or pathogenic mechanisms of diabetes and/or obesity.

Descrizione SS

The Cellular, Molecular and Integrative Reproduction [CMIR] Section reviews applications concerned with the molecular, cellular, endocrine, and physiological aspects of reproductive biology in both mammalian and model organism systems. Emphasis is on an integrative experimental approach to elucidate basic mechanisms controlling fertility.

- EMNR-CMIR-0480 Differentiation and maturation of male and female germ cells including the cellular, molecular, endocrine, and epigenetic mechanisms involved in spermatogenesis and oogenesis; also included is meiosis and reproductive aging in both male and female gametes.
- EMNR-CMIR-0481 Fertilization including sperm capacitation, sperm-zona pellucida binding, and sperm-egg fusion; also included are artificial reproductive techniques, cryopreservation of gametes and pre-implantation embryos, male and female infertility, and identification and role of possible contraceptive targets.
- EMNR-CMIR-0482 Embryo implantation including uterine receptivity and embryo/maternal tissue interactions; also included is early embryo development encompassing zygotic gene activation and epigenetic/imprinting mechanisms.
- EMNR-CMIR-0483 Development and function of the male and female gonads (testis and ovary), and their respective reproductive tracts; also included is the endocrine regulation in these tissues, soma-germ cell interactions, and the effect of xenobiotics and environmental factors on male and female reproductive processes.
- EMNR-CMIR-0484 Stem cell biology: Germ stem cells including stem cell niches in the gonads and cellular and molecular processes involved in sex determination; also embryonic stem cells including nuclear reprogramming, and epigenetic mechanisms

Descrizione SS

EMNR Integrated Review Group Fellowship Panel [F06] reviews fellowship applications in areas of endocrinology, metabolism, nutrition, and all aspects of reproductive sciences. Included are applications for a broad spectrum of research related to all aspects of general endocrinology, gametogenesis and reproductive physiology, pregnancy and lactation, and nutrient metabolism. In general F06 covers science range of all EMNR SRGs

- EMNR-F06-0523 Endocrine systems associated with the reproductive processes. Physiological, pathophysiological, and molecular and cell biological processes involving hypothalamic, pituitary, pineal, thyroid, adrenal, gonadal, and pancreatic hormones.
- EMNR-F06-0524 Gametogenesis, fertilization, embryology and development from the early stages of gonad development and through implantation of the embryo, pregnancy, and parturition, including neonatal development and maternal/fetal physiology.

- EMNR-F06-0525 Nutrient and energy metabolism utilizing molecular, cell biological and genetic tools and also translational studies on type 2 diabetes and obesity.
- EMNR-F06-0526 Adipocyte function, including nutrient storage and release, and communication with other endocrine organs and tissues.
- EMNR-F06-0527 Differentiation, development, growth, and function of pancreatic islets

EMNR - *ICER* **Integrative and Clinical Endocrinology and Reproduction - ICER**

Descrizione SS The Integrative and Clinical Endocrinology and Reproduction Section [ICER] reviews applications that focus on the physiology and pathophysiology of endocrine systems involving neurophysiological, molecular, biochemical, and cellular approaches. Emphasis is on clinical endocrine and reproductive science investigations.

- EMNR-ICER-0475 Growth, development, and disorders of endocrine organs: hypothalamic, pituitary, thyroid, and adrenal physiology, pharmacology, toxicology, and pathophysiology; mechanisms of puberty; endocrine-organ neoplasia; endocrine autoimmunity and immunobiology.
- EMNR-ICER-0476 Neuroendocrinology: reproductive neuroendocrinology including development and mechanisms of the hypothalamic-pituitary-gonadal (HPG) axis; anterior pituitary hormones; neurophysiology of hormones.
- EMNR-ICER-0477 Disorders of the female and male reproductive system: pathophysiology, mechanisms, and treatment of polycystic ovary syndrome (PCOS), endometriosis, hypogonadism, precocious puberty, pituitary adenomas, leiomyomas, and uterine fibroids.
- EMNR-ICER-0478 Endocrinology of aging: menopause; end-organ analysis; mechanisms of endocrine longevity of reproductive organs.
- EMNR-ICER-0479 Mammary gland development: maturation and physiology; hormonal control of lactation; prolactin

EMNR - *INMP* **Integrative Nutrition and Metabolic Processes - INMP**

Descrizione SS The Integrative Nutrition and Metabolic Processes Section [INMP] reviews applications concerned with the integration of molecular events, gene responses, metabolic processes, and physiological functions. These areas include macronutrients (carbohydrate, protein and lipid or fat), micronutrients (vitamins and minerals) and other food components. Emphasis is on clinically relevant research using cell culture systems, genetically manipulated animals, human studies to understand complications of these processes and their influence on disease

- EMNR-INMP-0506 Macronutrients: carbohydrate, proteins, amino acids, lipids, and their metabolites, mechanisms of their synthesis, degradation, metabolism, utilization, and inter-organ flux and turnover; the role of cholesterol, lipoproteins, and fatty acids in physiological and pathophysiological processes; molecular and cellular mechanisms underlying inherited disorders of metabolism.
- EMNR-INMP-0507 Micronutrients: vitamins (water-soluble and fat-soluble) requirement, utilization, metabolism, and function including genotype-phenotype relationships of vitamins metabolism and brain dysfunction and cognition; mineral elements metabolism including absorption, transport, metabolism, and function of macro- and trace-minerals; minerals/elements in neurochemistry and cognition, the acute phase response, immune function, and cellular development.
- EMNR-INMP-0508 Other food components: the role of carotenoids, flavonoids, polyphenols and phytonutrients on metabolic processes, cellular function, and gene expression.
- EMNR-INMP-0509 Oxidative stress and antioxidants: effects of nutrients, other food components, and metabolic substrates on the generation of reactive oxygen and nitrogen species, disease processes, antioxidant defense.
- EMNR-INMP-0510 Differentiation, pre-cancer, and immune response: effects of nutrients and other food components on normal and abnormal cell differentiation, proliferation, and immune functions or responses in animal models or human clinical trials

EMNR - *IPOD* **Integrative Physiology of Obesity and Diabetes - IPOD**

Descrizione SS The Integrative Physiology of Obesity and Diabetes [IPOD] Section reviews applications dealing with etiology and treatment of metabolic disturbances associated with obesity and diabetes, involving endocrinological, molecular/genetic, biochemical, neuroanatomical, systems biology, dietary, metabolic and integrative physiological approaches. Emphasis is on integrative systems approaches to elucidating peripheral and central regulatory pathways of carbohydrate, lipid and energy homeostasis.

- EMNR-IPOD-0495 Peripheral metabolic regulation: analysis of intermediary metabolic pathways and mitochondrial function in adipose tissue, liver and skeletal muscle related to diabetes and obesity; nutrient storage and release and communication among these three tissues; endocrine signaling among these tissues and their communication with the brain; effects of exercise and diet on metabolic processes in adipose tissue, liver and skeletal muscle.
- EMNR-IPOD-0496 Central metabolic regulation: analysis of neural regulatory pathways involved in control of body composition and energy and metabolic homeostasis; central actions of peripheral signaling molecules, such as leptin and insulin; neuroanatomical, neurodevelopmental, and neuroendocrinological analysis of circuits controlling food intake, energy expenditure and peripheral metabolism.
- EMNR-IPOD-0497 Cytokine, adipokines and inflammatory regulation of metabolic and energy control: effects on insulin action in adipose, liver, muscle and neural processes; cellular and molecular responses to changes in inflammation, cytokine and adipokines levels.
- EMNR-IPOD-0498 Dietary and exercise influences on metabolic regulation: use of whole body metabolic and body composition analysis to monitor changes in response to diet and exercise, including stable isotope studies, DEXA, glycemic clamps, MRI analysis of metabolic flux; the effects of perinatal diet and intrauterine growth on subsequent development of diabetes and obesity in adults and the role of epigenetics in these processes.
- EMNR-IPOD-0499 Hypoglycemia and counter regulatory responses: glucose sensing and neural control of counter regulatory responses; gluoregulation of neuronal activity in brain areas involved in metabolic and energy control; analysis of insulin and leptin action in the brain.

EMNR - MCE

Molecular and Cellular Endocrinology - MCE

Descrizione SS

The Molecular and Cellular Endocrinology Section [MCE] reviews applications that address the molecular and cell biology of endocrine organs and their products, both hormones and growth factors. This includes the synthesis and secretion of local and circulating hormones and growth factors, polypeptides and lipid-based ligands and their mechanism of action as they interact with cell-surface and nuclear receptors to influence cell structure, function, and the regulation of gene expression in both normal and pathologic states.

- EMNR-MCE-0470 Molecular mechanisms of polypeptide, steroid/thyroid hormone action and peptide hormone synthesis, processing, secretion, signaling, and trafficking.
- EMNR-MCE-0471 Hormonal and growth factor regulation of gene expression, including DNA-binding proteins, coactivators, corepressors, and other modulators of transcription.
- EMNR-MCE-0472 Regulation of cell growth and differentiation by steroid/polypeptide hormones and growth factors.
- EMNR-MCE-0473 Functional analysis of genomic and proteomic patterns of hormone action.
- EMNR-MCE-0474 Structure-function relationship of nuclear and peptide hormone receptors

EMNR - PN

Pregnancy and Neonatology - PN

Descrizione SS

The Pregnancy and Neonatology Section [PN] reviews applications related to the physiology of pregnancy and placental development, parturition, clinical obstetrics, maternal/ fetal medicine, and fetal/neonatal development utilizing molecular/genetic, cellular, whole-organ/animal/subject, and biochemical methodologies. Emphasis is on clinical and basic models to understand pregnancy progression and its disorders.

- EMNR-PN-0485 Placental development and maintenance: trophoblast invasion and differentiation; endocrinology and hormone production; transport functions; the development of utero-placental blood flow; maternal/fetal immune-tolerance mechanisms; hypoxia.
- EMNR-PN-0486 Parturition: cervical ripening; myometrial contractility; production of factors leading to labor; obstructive labor; clinical obstetrics.
- EMNR-PN-0487 Complications of pregnancy: preeclampsia; gestational diabetes; maternal metabolic changes and obesity; fetal origins of disease; spontaneous abortion; pre-term labor; recurrent pregnancy loss; diabetic embryopathy; intra-uterine growth restriction.
- EMNR-PN-0488 Fetal biology: growth, development, and metabolism; fetal physiology, pharmacology, toxicology, and neurobiology; fetal diseases; in utero infection; maternal-fetal interactions, fetal microchimerism.
- EMNR-PN-0489 Neonatology: transition to extra-uterine life; neonatal physiology, endocrinology, and pathophysiology; jaundice; complications of low birthweight; SIDS

Diabetes, Metabolism, Nutrition and Obesity Small Business SEP (EMNR E10 B)

Descrizione SS

The EMNR Small Business SEP [EMNR (10)] considers SBIR/STTR standing SEP reviews applications in areas concerned with the endocrine, metabolic and nutritional basis of diabetes and obesity. Specifically neuroendocrine basis of energy expenditure and weight management, pathogenesis of obesity and diabetes and their management utilizing new and improved therapeutic strategies, bioengineering approaches in monitoring metabolic and nutritional biomarkers.

- EMNR-SBMN-051 Energy expenditure, thermogenesis, physical activity, and exercise in the context of the pathogenesis or treatment of obesity and diabetes. Nutrient and dietary intervention in the treatment of these metabolic and endocrine disorders.
- EMNR-SBMN-051 Adipocyte functions, including: nutrient storage and release, and communication with other organs and tissues.
- EMNR-SBMN-051 Neuroendocrinology and pharmacological interventions in metabolic disorders.
- EMNR-SBMN-051 Biosensor (e.g., glucose sensors etc.) to effect continuous glucose monitoring for effective treatment of diabetes utilizing micro and nanosensor technologies. Drug and nutrient delivery across cell and tissue systems.
- EMNR-SBMN-051 Differentiation, development, growth, and function of pancreatic islets. Beta cell viability and methods at optimization for use in islet transplantation and cell based therapies

Reproductive Sciences Small Business SEP - EMNR E11 B

Descrizione SS

The EMNR Small Business SEP [EMNR (11)] SBIR/STTR standing SEP reviews applications in areas concerned with the emerging technologies and methodologies across all aspects of general endocrinology, pregnancy, reproductive and developmental physiology; these new and improved technologies and methodologies involve utility of molecular, cellular biological and bioengineering tools utilizing micro and nanotechnology in various reproductive processes including assisted reproductive processes.

- EMNR-SBRS-0516 Endocrinology and neuroendocrinology of male and female reproductive tract.
- EMNR-SBRS-0517 Estrogen receptors and endocrine disruptors, toxicology and hormonal treatment.
- EMNR-SBRS-0518 Assisted reproductive technologies (ART) and development of devices related to reproduction.
- EMNR-SBRS-0519 Studies of sperm, oocyte and fertilization and male contraceptives.
- EMNR-SBRS-0520 Disorders of pregnancy and their treatment and study of female contraceptives.
- EMNR-SBRS-0521 Implantation and pharmacological interventions
- EMNR-SBRS-0522 Pediatric endocrinology including pediatric neuroendocrinology related to growth, development and lactation

Descrizione IRG:

The Emerging Technologies and Training in Neurosciences [ETTN] Group reviews crosscutting neuroscience grant applications that focus either on application of emerging technologies to neuroscience problems or on training in the neurosciences. The scientific areas are broad and would include: genetics, bioengineering, bioinformatics, modeling, simulation, and imaging all in a neuroscience context. A premise of this Group and new neurotechnology study sections is that existing regular study sections in bioengineering (BST and SBIB), in neuroscience (BDCN, IFCN, and MDCN), and in genetics (GGG) will not be disrupted and will not be significant sources of applications for this Group. The intent is to cluster for better review applications presently reviewed in neuroscience.

ETTN - F01**Brain Disorders and Related Neurosciences Fellowship - F01****Descrizione SS**

The F01 Section reviews fellowship applications with an emphasis on clinical neuroscience and disease. The applications investigate aspects of neuroplasticity, neurodegeneration, neuroimmunology, developmental brain disorders, addiction and sleep disorders, and often employ brain imaging, electrophysiological recording, deep brain stimulation or computational modeling.

- ETTN-F01-0541 Genetic, transgenic and other animal models of Parkinson's, Alzheimer's and Huntington's diseases.
- ETTN-F01-0542 Therapeutic treatments for brain injury and diseases including neuroprotection, immunotherapeutics, cell transplantation, nanotechnology and deep brain stimulation.
- ETTN-F01-0543 In vivo neuroplasticity and neuroprotection studies related to epilepsy and other brain diseases.
- ETTN-F01-0544 Therapeutic strategies to enhance recovery of function after spinal cord injury, stroke, ischemia and traumatic brain injury.
- ETTN-F01-0545 In vivo studies of mechanisms underlying autism, schizophrenia, depression and bipolar disorders.
- ETTN-F01-0546 Therapeutic approaches for behavioral, cognitive and emotional disorders.
- ETTN-F01-0547 Pharmacotherapy for substance abuse disorders.
- ETTN-F01-0548 Studies of anterior eye diseases.
- ETTN-F01-0549 In vivo analysis of mechanisms and therapeutics for central nervous system tumors

ETTN - F02A**Behavioral Neuroscience Fellowship - F02A****Descrizione SS**

The F02A Section reviews fellowship applications with an emphasis on behavioral studies designed to further understanding of the nervous system at an integrative, systems level. Applications in this Section often employ a behavioral paradigm, coupled with a non-behavioral approach such as brain Imaging, microdialysis, In vivo electrophysiological recording, or genetic studies such as analysis of early gene expression, gene suppression/knockout studies or epigenetic manipulations.

- ETTN-F02A-0550 Interactions between environment and neural development, such as studies into the effects of social interaction / isolation, stress, aggression, maternal-offspring interaction or aging.
- ETTN-F02A-0551 The effects of hormones (HPA axis) on behavior during development or normal adult function, such as studies examining acute or chronic stress, sex differences or maternal responses.
- ETTN-F02A-0552 The interaction of circadian rhythms and behavior and including feeding, social interaction, sleep-wake cycles and hibernation.
- ETTN-F02A-0553 Responses to motivational stimuli such as food, fear and stress, as well as behavior related to drugs of abuse such as reward, drug sensitization, drug seeking and drug relapse.

ETTN-F02A-0554 Learning and memory processes, especially those centered in the limbic system or Prefrontal Cortex, such as fear conditioning, spatial context memory or reward.

ETTN-F02A-0555 Neurotoxicology

ETTN - *F02B*

Sensory, Motor and Cognitive Neuroscience Fellowship - F02B

Descrizione SS

The F02B Section reviews fellowship applications with an emphasis on understanding normal sensory, motor or sensorimotor function, as well as visual, somatosensory and nociceptive information processing, integration of multisensory information, and neural correlates of attention and cognition.

- ETTN-F02B-0556 Studies of motor control in animal models ranging from invertebrates to humans, focusing on cortical, subcortical, and spinal systems underlying locomotion and other motor behaviors utilizing methods ranging from cellular/molecular neurobiology to neurophysiology to human psychophysical and imaging approaches.
- ETTN-F02B-0557 Sensorimotor integration, such as studies of the rodent whisker-barrel system, birdsong and studies of proprioception.
- ETTN-F02B-0558 Mechanisms of touch, mechanosensation, thermosensation, encoded by somatosensory cortex as well as subcortical and spinal systems, assayed via molecular, anatomical, electrophysiological and behavioral methods.
- ETTN-F02B-0559 Mechanisms of pain and analgesia, ranging from studies of primary afferents to spinal circuits to central processes involved in nociception.
- ETTN-F02B-0560 Studies of anatomical and neurophysiological substrates of central visual processes, such as object and motion perception, binocular processes and studies of cortical plasticity at cellular and network levels.
- ETTN-F02B-0561 Topics in Cognitive Neuroscience, such as studies of attention, face and object perception, motor learning and reward mechanisms using fMRI and other imaging approaches.
- ETTN-F02B-0562 Studies of interactions of sensory modalities, such as interactions of auditory and visual systems and investigations of hand-eye coordination.

ETTN - *F03A*

Biochemical and Molecular Neuroscience Fellowship - F03A

Descrizione SS

The F03A Section reviews fellowship applications on the basic cellular and molecular biology of neuronal, glial, retinal and other excitable cells (including chromaffin cells, neuroendocrine cells and muscle cells); the fundamental mechanisms of neuronal cell function, including those relevant to disease processes; the general mechanisms underlying cell death; the mechanisms underlying the initial formation of, as well as cell specialization and differentiation in the developing nervous system; the mechanisms underlying oscillatory events; the mechanisms that specify or influence migratory events and the development, aging, and regeneration of neuronal connectivity; and the consequences of exposure to psychoactive drugs on these processes.

- ETTN-F03A-0563 Synaptic plasticity
- ETTN-F03A-0564 Cytoskeleton and trafficking
- ETTN-F03A-0565 Progenitor and stem cells
- ETTN-F03A-0566 Neural development and differentiation
- ETTN-F03A-0567 Axon outgrowth/ regeneration
- ETTN-F03A-0568 Glial biology/inflammation/myelination
- ETTN-F03A-0569 Circadian mechanisms
- ETTN-F03A-0570 Neurodegeneration/apoptosis

Descrizione SS

Areas of interest encompassed by this Section include the basic cellular and molecular physiology of neurons, glial, retinal, and other excitable cells (including chromaffin cells, neuroendocrine cells and muscle cells); the structural and functional characteristics of ion channels and transporters; the mechanisms by which extra- and intracellular signals are transduced; the structure and function of the transducers themselves; cellular regulation/physiology; neurochemical and pharmacological mechanisms, including the actions of psychoactive drugs; and the development of therapeutic compounds.

- ETTN-F03B-0571 Basic cellular and molecular physiology of neurons, Glial, retinal, and other excitable cells;
- ETTN-F03B-0572 Mechanisms by which extra-and intracellular signals are transduced;
- ETTN-F03B-0573 Structure and function of the transducers;
- ETTN-F03B-0574 Cellular regulation/physiology;
- ETTN-F03B-0575 Neurochemical and pharmacological mechanisms, including the actions of psychoactive drugs;
- ETTN-F03B-0576 Development of therapeutic compounds

ETTN - MNG**Molecular Neurogenetics - MNG****Descrizione SS**

The Molecular Neurogenetics (MNG) Section reviews applications that have their primary focus aimed at applying molecular genetic approaches in a neuroscience context. While this is a multidisciplinary area, the expectation is that projects will always have potential examination of a neuroscience question although they may not be hypothesis-driven in initial stages.

- ETTN-MNG-0528 Molecular genetic tools used to study mechanisms underlying neurodegeneration, addiction, and normal neuronal functions.
- ETTN-MNG-0529 Epigenetic regulation: neural gene expression including chromatin remodeling.
- ETTN-MNG-0530 Neurogenetic variation: both in humans and model systems.
- ETTN-MNG-0531 Methods for gene delivery: exogenous genes and silencers to specific neurons.
- ETTN-MNG-0532 Molecular imaging technologies: to study translational and transcriptional regulation, as well as gene expression profiling, in neurons and glia.
- ETTN-MNG-0533 Neuronal phenotypes: Analysis and refinement of phenotypic characteristics

ETTN - NT**Neurotechnology - NT****Descrizione SS**

The Neurotechnology (NT) Section reviews applications to develop and utilize computational, informatic, imaging, biophysical, and bioengineering approaches for studying fundamental problems in neuroscience. While the multidisciplinary nature of NT covers a wide range of technologies, the central theme is a neuroscience context. Proposals need not be hypothesis driven, if the emphasis is on technique development or application.

- ETTN-NT-0534 Computational and mathematical analyses: Modeling and simulation of neuronal ensembles; neural signal processing software.
- ETTN-NT-0535 Neural imaging from molecular, cellular, or network level to whole brain: MRI, DTI visualization of brain lesions and abnormalities; fMRI, EEG, MEG localization of disorder-related neuronal activity; TMS optimization; algorithms and other tools for neuroimaging analysis.
- ETTN-NT-0536 Informatics-based study of nervous systems: Multi-modal brain atlas; database construction, integration, and sharing; neuroscience-focused knowledge environments.
- ETTN-NT-0537 Application of new or emerging bioengineering or biophysical approaches to the structure, function, or disorders of the nervous system.
- ETTN-NT-0538 Electrode-based brain monitoring: Multi-electrode array design and optimization; device-neural tissue interfaces
- ETTN-NT-0539 Neuroprosthetic device development
- ETTN-NT-0540 Bioengineering approaches to nervous system remodeling: Scaffolds for nerve regeneration; in vitro platforms for manipulation of neuronal differentiation and outgrowth; microfluidically controlled release of compounds

Descrizione SS

The topics covered in SBBA: Developmental Biology and Aging Small Business SBBA section include applications in the areas of developmental biology and aging, using diverse animal and plant models or human studies, and employing approaches at a variety of levels from molecules to whole organisms. Proposals that concern geriatric studies may transcend the boundaries of single organs or systems (e.g., in co-morbidities), and may require integrated experimental, genetic or observational approaches. Studies may examine the basic biology of stem cells as well as strategies for their culture and differentiation in vitro and vivo. Novel strategies for animal cloning as well as the use of genetic approaches to address developmental questions are also covered. Projects may focus on the development of new animal models to examining development and aging as well as toxicological and teratological assays in model organisms for identification of birth defects. Finally, the development of novel devices and monitoring devices for geriatric patients as well as pharmacological interventions for age dependent cognitive and physiological deficits are also covered.

- ETTN-SBBA-0595 Basic biology of stem cells, in vitro culture of blastocysts and embryos; animal and human embryonic and adult stem cells.
- ETTN-SBBA-0596 Novel strategies for animal cloning.
- ETTN-SBBA-0597 Development of toxicological and teratological assays in model organisms for identification of birth defects.
- ETTN-SBBA-0598 New models of development or aging: including transgenic, animal, cellular and plant models of development, birth defects, cell death, regeneration and repair, and aging/longevity.
- ETTN-SBBA-0599 Methods for analysis of apoptosis and apoptotic signal imaging in relation to remodeling of organ systems during development and aging.
- ETTN-SBBA-0600 Markers that may predict aging or cellular senescence; inhibitors of senescence.
- ETTN-SBBA-0601 Novel devices and monitoring systems for geriatric patients.
- ETTN-SBBA-0602 Interventions for age-dependent cognitive and physiological deficits in humans

Descrizione SS

The topics covered in the SBMC Molecular and Cellular Neuroscience Small Business section include those areas on the molecular and cellular level. In general, the projects involve development of devices, reagents, and software to probe channels, signal transduction, and the transducers themselves. Studies may involve basic biological processes that underlie or may be altered by disease processes. Examples of devices might include development of imaging and recording techniques; analytical and system controlling software; monitoring and assay platforms; neuroprosthetic devices; biosensors; and stem cells and cell culture systems. Projects might also focus on neurodrug discovery and development; molecular manipulation and engineering; development of specific research reagents and assays; therapeutics; and proteins that interact with and modulate neuroreceptors, transporters and transducers.

- ETTN-SBMC-0591 Development of devices, reagents, and software to probe channels, signal transduction, and the transducers themselves.
- ETTN-SBMC-0592 Studies may involve basic biological processes that underlie or may be altered by disease processes.
- ETTN-SBMC-0593 Devices may include development of imaging and recording techniques, analytical and system controlling software, monitoring and assay platforms, neuroprosthetic devices, biosensors, and stem cells and cell culture systems.
- ETTN-SBMC-0594 Projects may also focus on neurodrug discovery and development, molecular manipulation and engineering, development of specific research reagents and assays, therapeutics, and proteins that interact with and modulate neuroreceptors, transporters and tradu

Clinical Neurophysiology, Devices, Auditory Devices and Neuroprosthesis Small Business -SBNE

Descrizione SS

This small business Section SBNE include developing new monitoring devices (amplifiers, electrodes) and analyses tools for EEG and related signals (ERPs) for applications in the fields of epilepsy, sleep disorders, neurological critical care, and some other miscellaneous applications such as cognitive alterations. New applications of imaging methodologies and ancillary tools for diagnostics and research applications are also reviewed in this Section. Implantable electrodes and various aspects of neuroprosthetics devices (new arrays, telemetry, external power, etc.) and their clinical and research applications are also covered. The Section also reviews applications related to monitoring and interventional tools for the neurovascular defects (such as aneurysms), stroke, and ICP monitoring. This Section also reviews applications dealing with the auditory system and hearing, including enhancing hearing of impaired individuals, diagnostic audiometry and devices or processes related to the neurobiology of the auditory system.

- ETTN-SBNE-0577 Ways to improve prosthetic limbs (comfort, fit, control).
- ETTN-SBNE-0578 Improved detection and treatment of stroke patients.
- ETTN-SBNE-0579 Improved detection of traumatic brain injuries, especially mild to moderate ones that may go undetected in the "field".
- ETTN-SBNE-0580 Improved ability to detect and treat seizures, by improving the electrode placement or improving the capability for a non-neurologist to do it in the emergency room.
- ETTN-SBNE-0581 Methods to improve and detect sleep disorders.
- ETTN-SBNE-0582 Development of auditory devices to allow better hearing in noisy environments to cochlear implants to improve hearing

Pharmacology and Diagnostics for Neuropsychiatric Disorders and Neural Systems Small Business - SBPD

Descrizione SS

This Section SBPD reviews Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] applications concerned with the diagnosis and treatment of neurological and psychiatric disease. Applications include medicinal chemistry studies aimed at identifying lead therapeutic compounds or developing new diagnostic products. Other applications may focus on Investigational New Drug (IND) enabling studies or Proof-Of-Concept clinical studies on either IND approved agents or new indications for previously approved therapeutics. Emphasis is placed on the near term development of specific products with commercial viability being an important consideration.

- ETTN-SBPD-0583 Neuropathological events such as Stroke, Spinal Cord Injury and Traumatic Brain Injury.
- ETTN-SBPD-0584 Neurodegenerative disorders such as Multiple Sclerosis, Alzheimer's, Huntington's and Parkinson's diseases.
- ETTN-SBPD-0585 Psychiatric disorders such as Autism, Depression and Schizophrenia.
- ETTN-SBPD-0586 Neurological disorders such as Chronic pain, Migraine and Neuropathic pain.
- ETTN-SBPD-0587 Alcoholism and Drug Addiction

Visual Systems Small Business SBVS

Descrizione SS

The Visual System small business Section (SBVS) reviews applications concerned with novel medical devices, monitoring systems and adaptation/improvement of existing technologies for normal and pathologic states of the eye. Also included is the development of devices to aid the blind and visually impaired.

- ETTN-SBVS-0588 Devices to enable the blind or people with low vision the ability to function more independently.
- ETTN-SBVS-0589 Devices to enable diagnosis of specific ocular conditions more definitely or easier by a non-specialist.
- ETTN-SBVS-0590 Improvements in the treatment of specific ocular disorders

Descrizione IRG:

The Genes, Genomes and Genetics [GGG] Group will review research applications on fundamental and applied aspects of genes, genomes and genetics of humans and other organisms. Areas considered are fundamental mechanisms and regulation of gene expression, including chromosome function and maintenance, the regulation of DNA and RNA metabolism, translation, and posttranslational modification. Genomic studies, computational biology and technology development will also be considered, including development of new genetic tools and resources, global analysis of genetic systems, biological and computational resource development, and classification, storage, access, analysis and integration of genetic and other biological information. Genetic variation and evolution will be reviewed under the GGG Group including the description, analysis and modeling of induced and natural genome variation, and comparisons between species. All aspects of quantitative genetics including complex trait mapping will be considered in humans and a wide variety of other species. The involvement of genetics in human health and disease will be considered, including the discovery, application and interpretation of gene and genomic variation influencing phenotype and the development of experimental and computational approaches to the identification of disease-related genes. Proposals dealing with model systems of all organisms, as they relate to human health and disease, will be considered, as will translational genetic studies applying fundamental genetic insight into the clinical setting

GGG- GCAT**Genomics, Computational Biology and Technology - GCAT****Descrizione SS**

The Genomics, Computational Biology and Technology [GCAT] Section reviews applications involving global and integrative analyses of biological systems, and the development of new computational algorithms and statistical methodology as applied to genomic studies.

- GGG-GCAT-0631 Generation, analysis, and mining of large data sets: genetic, epigenetic, biochemical, gene expression, metabolic, proteomic, microarrays, genome sequencing, comparative genomics.
- GGG-GCAT-0632 Large-scale genomic, genetic and epigenetic resources: collections of mutant strains and lines, tagged genes, small molecule probes, model organism systems for genetic, genomic or high throughput analyses, high throughput genetic and epigenetic technologies, classification and annotation systems for genetic and epigenetic data including data storage, databases, and user interfaces.
- GGG-GCAT-0633 Development and application of emerging genomic and epigenomic technologies to cellular, metabolic or disease pathways.
- GGG-GCAT-0634 Computational and mathematical representation and simulation of genetic systems: genetic and biochemical networks, genetic and epigenetic systems biology, signaling pathways, physiological or metabolic systems, integration of data sets.
- GGG-GCAT-0635 Development of new statistical genetic methods and computational algorithms and software

Descrizione SS

The GHD Section will review applications involving the discovery, application and interpretation of genetic and genomic variation in human phenotype and disease.

- GGG-GHD-0641 Discovery of genes and genetic variation for human health, disease, and disease susceptibility: Complex and Mendelian diseases such as psychiatric, neurological, ophthalmological, auditory, endocrinological, cardiovascular, developmental, reproductive, oncological, autoimmune, urological, respiratory; use of sophisticated genetic and genomic methods to identify candidate genes, single nucleotide polymorphisms, haplotypes, and copy number variation.
- GGG-GHD-0642 Gene discovery and functional analysis using animal and cellular (human and animal) models: Development of explicit models of human genetic disease using vertebrate animals such as mice, rats, dogs, and non-human primates; use of models for studies of candidate genes and their functional analysis, pathogenetics, positional cloning, quantitative loci.
- GGG-GHD-0643 Epigenetics and disease: Abnormalities in imprinting or X inactivation that lead to disease; gene and environmental interactions, or maternal genotypes that lead to epigenetic changes and disease; variation in epigenetic marks, non-coding RNAs, and epigenome mapping.
- GGG-GHD-0644 Cytogenetics and disease: Chromosomal and genomic disorders, aneuploidy, translocations, mosaicism, chimerism, dosage effects

Descrizione SS

The Genetic Variation and Evolution [GVE] Section reviews grant applications related to the origin, distribution, maintenance, and evolutionary consequences of genetic variation to provide for the expansion of fundamental knowledge about living systems. Understanding genetic variation and evolution is central to modern approaches to biomedicine, epidemiology, health, and disease. Studies make use of mathematical models, computer simulations, viruses, microbes (prokaryotic and eukaryotic), plants, and animals, including natural populations, laboratory model systems, and humans.

- GGG-GVE-0636 Applications of evolutionary principles to: biomedicine, epidemiology, health, and disease; including host-pathogen interactions, genetics of virulence or resistance, co-evolutionary dynamics, and population structure.
- GGG-GVE-0637 Mechanisms of evolution: selection, adaptation, mutation, recombination, gene/genome duplication, transposition, chromosomal evolution, and speciation;
- GGG-GVE-0638 Genotype --> phenotype mapping: genetics of complex traits in whole organisms, QTL mapping, association mapping, disease mapping, evolution of development (evo-devo), evolution of enzymes and biochemical pathways/networks, genotype-environment interactions, evolvability, and heritability;
- GGG-GVE-0639 Population genetics: theory, experimental approaches, and application to large genomic datasets;
- GGG-GVE-0640 Molecular evolution from genes to genomes: phylogenetics, comparative genomics, bioinformatics, computational biology, modeling, and systems biology

Descrizione SS

The molecular genetics [MGA] Sections review applications involving molecular mechanisms of genome replication, maintenance and gene expression in eukaryotes, prokaryotes and viruses. Experimental approaches include the use of whole organisms, transgenic organisms, stem cells, differentiation, development and disease models and cell free systems, genetics, genomics, and bioinformatics.

- GGG-MGA-0612 Genomes: Genome stability and modification, gene regulatory networks, gene network programming.
- GGG-MGA-0613 Chromatin: Chromatin structure and function, remodeling and modification, epigenetic control mechanisms, and DNA and histone modifications, gene silencing, functions of non-coding RNAs.
- GGG-MGA-0614 DNA Metabolism: replication, recombination, repair, damage, cell cycle checkpoint regulation; mobile genetic elements.
- GGG-MGA-0615 Transcription: mechanisms of transcription, regulatory sequences, and transcription factors and their modification (including steroid nuclear receptors).

GGG-MGA-0616	RNA Metabolism and Translation: RNA processing and turnover; splicing; protein synthesis, turnover and modification; non coding RNA synthesis, structure and function; ribosome biogenesis and function
GGG-MGA-0617	Genomes: Genome stability and modification, gene regulatory networks, gene network programming
GGG-MGA-0618	Chromatin: Chromatin structure function, remodeling and modification, epigenetic control mechanisms, DNA and histone modifications, gene silencing, functions of non-coding RNAs
GGG-MGA-0619	DNA Metabolism: replication, recombination, repair, damage, cell cycle checkpoint regulation; mobile genetic elements
GGG-MGA-0620	Transcription: mechanisms of transcription, regulatory sequences, and transcription factors and their modification (including steroid nuclear receptors).
GGG-MGA-0621	RNA Metabolism and Translation: RNA processing and turnover; splicing; protein synthesis, turnover and modification; non coding RNA synthesis, structure and function; ribosome biogenesis and function.
GGG-MGA-0622	Epigenetic processes: imprinting, transvection, paramutation, X inactivation, dosage compensation
GGG-MGA-0623	Gene expression mechanisms in plants
GGG-MGA-0624	Genomes: Genome stability and modification, gene regulatory networks, gene network programming.
GGG-MGA-0625	Chromatin: Chromatin structure function, remodeling and modification, epigenetic control mechanisms, DNA and histone modifications, gene silencing, functions of non-coding RNAs.
GGG-MGA-0626	DNA Metabolism: replication, recombination, repair, damage, cell cycle checkpoint regulation; mobile genetic elements.
GGG-MGA-0627	Transcription: mechanisms of transcription, regulatory sequences, and transcription factors and their modification (including steroid nuclear receptors).
GGG-MGA-0628	RNA Metabolism and translation: RNA processing and turnover; splicing; protein synthesis, turnover and modification; non-coding RNA synthesis, structure and function; ribosome biogenesis and function
GGG-MGA-0629	Chromosome functions: meiosis, mitosis, telomere biology, aneuploidy, repeat expansions
GGG-MGA-0630	Human DNA repair and recombination pathways

GGG - *PCMB*

Prokaryotic Cell and Molecular Biology - PCMB

Descrizione SS

The Prokaryotic Cell and Molecular Biology [PCMB] Section reviews applications addressing the genetics, biochemistry, structure, physiology and behavior of bacteria, archaea, and their phages. The focus of the Section is on research whose results will be applicable principally to microbial organisms. Studies may use pathogenic or nonpathogenic organisms and be at the genetic, molecular, biochemical, cellular, or community level.

GGG-PCMB-0603	Transcription, RNA processing, gene expression and regulation, regulatory networks and dynamics
GGG-PCMB-0604	Replication, recombination, mutation, repair, mobile genetic elements and gene transfer
GGG-PCMB-0605	Protein synthesis and modification
GGG-PCMB-0606	Intermediary metabolism and energetics
GGG-PCMB-0607	Development, differentiation, morphogenesis, cell division, export, secretion, and localization.
GGG-PCMB-0608	Intercellular signaling, environmental interactions, symbiosis, chemotaxis and motility.
GGG-PCMB-0609	Stress response, survival, and death
GGG-PCMB-0610	Assembly of supramolecular structures
GGG-PCMB-0611	Modeling of microbial cell processes, functional genomics and proteomics

GGG - *SEEL*

**Ethical, Legal, and Social Implications of Human Genetics
Special Emphasis Panel - ELS**

Descrizione SS

The Ethical, Legal, and Social Implications of Human Genetics [ELS] Section reviews ethical, legal, and social implications of human genetics.

- GGG-SEEL-0654 Psychosocial, ethical, and legal issues for both consumers and professionals in testing for genetic diseases including cancer
- GGG-SEEL-0655 Sociological/anthropological studies related to human genetics;
- GGG-SEEL-0656 Philosophical studies;
- GGG-SEEL-0657 Genetic policy studies; and history of science studies

GGG- SEGT Gene Therapy and Inborn Errors - GTIE Special Emphasis Panel

Descrizione SS Genetic basis of defects in lipid, amino acid, carbohydrate and nucleic acid metabolism and organelle function and development of strategies for their correction. This can include investigation of inborn errors of metabolism, mitochondrial defects, mechanism of mutation and gene silencing, replacement or repair.

- GGG-SEGT-0649 Development of gene therapy approaches for metabolic diseases, including lysosomal, peroxisomal and mitochondrial storage diseases, affecting multiple organs
- GGG-SEGT-0650 Molecular genetics of viral and non-viral vectors within target cells and tissues:
- GGG-SEGT-0651 Studies of transduction, integration, replication and repair, gene expression and gene silencing mechanisms in animal and human tissues and in animal models of diseases
- GGG-SEGT-0652 Studies of inborn errors and other rare diseases: including biochemical genetics to elucidate regulation and dysregulation in metabolic pathways; studies of genetic mutations, transcriptional networks, protein structure/function and post-translational modifications; clinical manifestations; diagnosis and treatment development
- GGG-SEGT-0653 Development of in vitro and animal models of disease for gene therapy investigation

GGG- TAG Therapeutic Approaches to Genetic Diseases - TAG

Descrizione SS TAG Section covers mechanisms by which genomic abnormalities that cause genetic disease lead to disease pathogenesis. Further, the Section covers development of therapeutics for genetic diseases.

- GGG-TAG-0645 Molecular mechanisms of genetic disease pathogenesis at the level of: gene expression; epigenetic modifications; RNA metabolism; protein structure function; protein synthesis, post-translational modifications, folding and trafficking; metabolic and signaling pathways; regulatory networks.
- GGG-TAG-0646 Development of genetic disease therapies: cellular and gene therapies; transfer, replacement and correction of genes; alterations of gene expression through silencing, modification or activation of gene expression; interventions (including small molecules) altering protein function, e.g., folding or post-translational modifications, enzyme replacement and substrate reduction therapies.
- GGG-TAG-0647 Development of resources for mechanisms and therapies of genetic diseases: stem cells, nucleic acid transfer vectors, and animal models of human diseases.
- GGG-TAG-0648 Preclinical and initial clinical studies of genetic disease therapies

Descrizione IRG:

The Healthcare Delivery and Methodologies [HDM] Group reviews applications for research on health and health-related behaviors of individuals and populations, particularly studies that examine socio-environmental factors, cultural factors and processes, institutions, social organization, social networks, media, and social and family group membership. Specific areas of interest reviewed within the HDM Group include (but are not limited to): studies of socio-environmental influences on health, behavior and development; community and organizational interventions for the prevention and modification of risk behaviors; health services research on the antecedents and consequences of health services utilization, including multidisciplinary investigations of factors affecting access, organization, costs, quality, and the financing of health services; methodological issues, various statistical techniques, and modeling of phenomena relevant to behavioral and social science research; description, prevention, treatment and control of chronic and communicable diseases in the community; approaches to promoting health and preventing disease; interventions influencing patient health outcomes, costs and nursing systems; bioethics; and occupational or work environments and their relationship to health and well-being of workers

HDM - BCHI**Biomedical Computing and Health Informatics - BCHI****Descrizione SS**

The Biomedical Computing and Health Informatics [BCHI] Section reviews applications that focus on informatics, using a biomedical discovery, process or clinical question to demonstrate and/or validate the informatics and computing approaches. The emphasis is on direct population applications. Applications in which informatics is used as a tool in the biomedical discovery process, or to support clinical studies, would be assigned to the scientific review group dealing with the particular biomedical or clinical topics.

- HDM-BCHI-0667 Application of human-centered computing (human-machine interfaces), intelligent systems, virtual environments, computer-assisted diagnosis and treatment systems with data including imaging data and telemedicine to biomedical and clinical systems, including the study of collaboration to engineer-usable effective software systems.
- HDM-BCHI-0668 Application of modeling and simulation methods to various levels of normal and pathophysiological processes. Mathematical modeling of physiological functions/systems, where the outcome is of medical/clinical import and the purpose of the model is to inform medical decision making. Application of data analysis, management and mining in the areas of electronic medical records, picture archiving, tele-imaging, robotics, consumer informatics, and population-based databases.
- HDM-BCHI-0669 Medical and biomedical knowledge and information-management systems, including ontologies and controlled vocabularies.
- HDM-BCHI-0670 Application of clinical and biomedical software engineering, including validation of software in clinical settings.
- HDM-BCHI-0671 Application of advanced computing architectures to questions in biomedical and clinical information and knowledge management.

Descrizione SS

The Biostatistical Methods and Research Design (BMRD) Section reviews applications that seek to advance statistical and mathematical techniques and technologies applicable to the design and analysis of data from biomedical, behavioral, and social science research. Emphasis is on the promotion of quantitative methods to aid in the design, analysis, and interpretation of clinical and population based research studies.

- HDM-BMRD-0658 Research design: development and adaptation of methods for survey sample design; sample size determination; design issues for experimental and observational studies; randomized trial designs; methods to improve study design efficiencies
- HDM-BMRD-0659 Data collection and measurement: development and adaptation of methods to estimate and improve data precision, reliability, and validity; methods to estimate and adjust for bias, measurement error, confounding, sampling and non-sampling error; psychometric methods
- HDM-BMRD-0660 Data analysis and modeling: development of statistical theory, analytic methods and models, computational tools and algorithms for the analysis and interpretation of data from clinical studies, randomized trials, epidemiological studies, human genetic association studies, environmental studies, and complex surveys; methods to handle data features and anomalies such as correlation, clustering, missing and skewed data; risk prediction and forecasting methods; causal modeling; high dimensional data methods

Descrizione SS

The Community Influences on Health Behavior [CIHB] Section reviews applications concerned with the broader socioenvironmental contexts in which health, disease, health-related behavior, and normal development are embedded, including those applications that examine the interaction of socioenvironmental factors with individual biopsychosocial factors. The applications may examine social, cultural, and other socioenvironmental factors and processes and their inter-relationships with a broad range of outcomes, including mental and physical health, illness and disorder, risk and protective behaviors and behavior change, health beliefs and attitudes, and normal development and functioning across the lifespan. Research approaches may include ethnographic and other qualitative methods; quantitative and mixed-method studies; cross-sectional, longitudinal, or cohort comparison designs; experimental and quasi-experimental designs; studies that focus on more than one period or transition of the life course; and international studies

- HDM-CIHB-0664 Socioenvironmental influences on health, behavior, development, and disparities may include social class, deprivation and socioeconomic conditions, cultural factors and processes, institutional structures and constraints, social organization, interactions and social networks, neighborhood and regional characteristics, media, policies, social and family group membership and interactions, and racial and ethnic identity.
- HDM-CIHB-0665 Studies of the social, cultural, and socioenvironmental contexts in which health, disease, behavior and normal development are embedded may include studies of acculturation; diffusion; ideational belief and behavior change; interpersonal communication processes, development of the meaning of health and illness and implications; family structure and functioning; networks and social support; power relations; economic inequality; ethnic, racial and class identity; and social, cultural, institutional, and community change.
- HDM-CIHB-0666 Studies of social environment change may include a focus on policy development, change, and enforcement; legal analyses of policies and their implementation; information dissemination; and health promotion. In addition, the contexts may include communities, schools, worksites or other relevant environment settings.

Descrizione SS

The Community-Level Health Promotion [CLHP] Section reviews applications that test the efficacy of interventions that focus on the prevention of health risk behaviors and/or adherence to disease treatments across the lifespan. Studies may investigate social, cultural, and other socioenvironmental factors and processes and their inter-relationships with a broad range of outcomes, including mental and physical health, illness and disorder, risk and protective behaviors and behavior change, health beliefs and attitudes, and normal development and functioning. Research approaches may include ethnographic and other qualitative methods; quantitative and mixed-method studies; cross-sectional, longitudinal, or cohort comparison designs; experimental and quasi-experimental designs.

- HDM-CLHP-0661 Social environment change, including approaches based on policy development, change, implementation, and enforcement; information dissemination; health promotion; organization or reorganization in communities, schools, worksites, service delivery organizations or other relevant environment settings; and sports medicine and exercise.
- HDM-CLHP-0662 Community and organizational interventions of randomized experimental and quasi-experimental design in which the unit of assignment is the community or other multi-person entity; interventions that utilize community resources, organizations and information systems for outreach, health education or service delivery; natural experiments; social and organizational networks as systems for intervention and services delivery; and studies of organization and community characteristics and change processes underlying successful services delivery and intervention implementation.
- HDM-CLHP-0663 Studies of the adoption and dissemination of health-risk behavior preventive interventions and services or adherence to treatment and/or complementary treatments

HDM - F16

Health and Health Related Behavior of Individuals and Populations Fellowship - F16

Descrizione SS

The F16 Section reviews fellowship applications concerned with the interaction of socioenvironmental factors with the health and health related behavior of individuals and populations. Emphasis is placed on the influence of these factors on health, behavior and development; group or individual-level interventions to prevent or modify risk factors; population processes and their antecedents and consequences; health services research; epidemiological studies; and quantitative methodologies.

- HDM-F16-0686 Behavioral genetics and heritability
- HDM-F16-0687 Epidemiology in the areas of cancer, chronic conditions, communicable diseases, conditions related to aging, reproductive health, mental health, and substance abuse disorders
- HDM-F16-0688 Studies to test the efficacy of interventions on the prevention of health risk behaviors across the lifespan
- HDM-F16-0689 Population-based studies of health promotion and environmental change
- HDM-F16-0690 Techniques and methodologies that address statistical and mathematical problems in population-based studies
- HDM-F16-0691 Examination of the interaction of socioenvironmental factors with individual factors
- HDM-F16-0692 Interrelationships of sociocultural factors and biomedical processes
- HDM-F16-0693 Studies of health services and service delivery systems

HDM - HSOD

Health Services Organization and Delivery - HSOD

Descrizione SS

The Health Services Organization and Delivery (HSOD) Section reviews health services research studies that include multidisciplinary investigations of the predictors, processes and outcomes of health services, including availability, access and acceptability; organization; decision-making; delivery, utilization, and quality of care; and costs, cost-effectiveness and financing of health care. Health services include inpatient, outpatient, sub-acute, acute, community-based, rehabilitative and long-term care.

- HDM-HSOD-0672 Community, provider, economic, technological, and management resources and support, including studies of supply and area market behaviors; health care provider characteristics; health insurance, reimbursement, and financing mechanisms; health care management technology and assessment of emerging technology; health care delivery system characteristics.
- HDM-HSOD-0673 Health needs and health services utilization; studies of severity of illness; comorbidity; risk prediction and risk adjustment; psychosocial and economic factors related to health care; and adherence to health care recommendations.
- HDM-HSOD-0674 Healthcare organizations, programs, and delivery of services; including those delivered in non-traditional settings; integrated care delivery systems; disease management and modeling; continuous quality improvement; characteristics of the organization and patient outcomes; organizational performance and efficiency; cost-benefit analysis; economics of health care and pharmacoeconomics.
- HDM-HSOD-0675 Healthcare quality, effectiveness, and outcomes; clinical practice guidelines; treatment and prevention outcomes; patient and provider satisfaction; health status and outcomes assessment; evidence-based practice; health-related quality of life; medical decision-making.
- HDM-HSOD-0676 Health disparities; access to health care; cost of health care; organizational programs for health advocacy; evaluation of public-private collaborative and inter-organizational network services delivery; formal and informal care provision

Descrizione SS

The Nursing Science: Adults and Older Adults (NSAA) Section reviews applications that address the science that underpins clinical practice and is concerned with preventing, delaying the onset, and slowing the progression of disease and disability among mid-life and older adults. Emphasis is on elucidating approaches to achieve and sustain a healthy lifestyle, easing the symptoms of illness, improving quality of life for patients and caregivers, reducing health disparities, and addressing issues at the end-of-life.

- HDM-NSAA-0677 Health promotion and disease prevention, including studies on healthy aging; exercise; nutrition; health risk behaviors; biomarkers to assess disease risk and response to treatment; women's health, such as the menopausal transition; and men's health.
- HDM-NSAA-0678 Clinical management of adults with acute and chronic illnesses, including studies on clinical decision-making; self-care behaviors; functional status; quality of life; adherence; provider-patient communication; caregiver issues; symptom management; new technologies to improve clinical care; and care at the end-of-life.
- HDM-NSAA-0679 Health disparities research, including studies on the needs of racial and ethnic minorities and other health disparity groups with limited access to care; potential mechanisms underlying health disparities; and interventions aimed at reducing risk factors for disparate health outcomes.
- HDM-NSAA-0680 Health care delivery research related to patient outcomes, including studies on patient outcomes of acute, long-term, home, and community health care; and quality, cost-effectiveness and informatics issues.

Descrizione SS

The Nursing Science: Children and Families Section (NSCF) reviews applications that address the science that underpins clinical practice and is concerned with preventing, delaying the onset, and slowing the progression of disease and disability from preconception to young adulthood. Emphasis is on elucidating approaches to achieve and sustain healthy family functioning, promoting healthy lifestyles and behaviors, reducing health disparities, easing the symptoms of illness, addressing issues at the end-of-life, and improving quality of life for patients, caregivers and families.

- HDM-NSCF-0681 Health promotion and disease prevention, including studies on normal growth and development; maturational processes; pregnancy; parenting; family functioning; exercise; nutrition; obesity prevention; health risk behaviors; injury prevention; and biomarkers to assess disease risk and response to treatment.
- HDM-NSCF-0682 Clinical management in acute and chronic illnesses, including studies on clinical decision-making; self-care behaviors; functional status; quality of life; adherence; provider-patient communication; caregiver issues; family illness management; new technologies to improve clinical care; and care at the end-of-life.
- HDM-NSCF-0683 Health disparities research, including studies on the needs of racial and ethnic minorities and other health disparity groups with limited access to care; potential mechanisms underlying health disparities; and interventions aimed at reducing risk factors for disparate health outcomes.
- HDM-NSCF-0684 Health care delivery research related to patient outcomes, including studies on patient outcomes of acute, long-term, home, and community health care; and quality, cost-effectiveness and informatics issues.

Descrizione SS

The REHS section reviews applications that deal with the ethical issues in human subjects research that are not primarily focused on genetics related issues.

- HDM-REHS-0694 Assessing risks in human subjects research including how the characteristics of research subjects may impact the research design.
- HDM-REHS-0695 Evaluating issues in informed consent including decisional capacity of various populations and evaluating strategies to improve the process of informed consent for research.
- HDM-REHS-0696 Evaluating different methods and best practice strategies for conducting international research.
- HDM-REHS-0697 Evaluating the study design used in clinical trials and its relationship to medical care.

HDM - *SBHD* **Healthcare Delivery and Methodologies Small Business - - SBHD**

Descrizione SS SBHD section [SBIR/STTR] applications seek to understand and elaborate the broader socioenvironmental contexts in which health and health-related behavior are embedded and to examine the interaction of these socioenvironmental factors with the health and health-related behavior of individuals and populations are reviewed . The socioenvironmental factors studied may include social class, socioeconomic conditions, cultural factors and processes, institutions, social organization, social networks, neighborhood and regional characteristics, media, policies, social and family group membership, and racial and ethnic identity.

HDM-SBHD-0685 applications seek to understand and elaborate the broader socioenvironmental contexts in which health and health-related behavior are embedded and to examine the interaction of these socioenvironmental factors with the health and health-related behavior of individuals and populations are reviewed within dedicated special emphasis panels within the HOP IRG. The socioenvironmental factors studied may include social class, socioeconomic conditions, cultural factors and processes, institutions, social organization, social networks, neighborhood and regional characteristics, media, policies, social and family group membership, and racial and ethnic identity

IDM ***IDM - Infectious Diseases and Microbiology***

Descrizione IRG: The Infectious Diseases and Microbiology [IDM] Group will consider applications involving the basic biology of microbes (excluding HIV), multicellular parasites and their vectors, and the infections and diseases caused by these agents. Specifically the IDM Group reviews research grant applications concerning virology and viral pathogenesis, bacteriology and bacterial pathogenesis, fungal pathogenesis, parasitology and parasitic diseases, the innate and adaptive host responses to these microbes and viruses, and the development of anti-infective agents to treat and prevent infectious disease. If the focus of a grant application is a pathogen or a pathogenic mechanism, assignment for review could be to an IDM study section.

IDM - *BACP* **Bacterial Pathogenesis - BACP**

Descrizione SS The Bacterial Pathogenesis [BACP] Section reviews applications concerned with bacterial pathogens or the pathogen side of the host-pathogen relationship.

- IDM-BACP-0699 Genetic, biochemical and structural characterization of the regulation and determinants of virulence and pathogenicity, including: capsules, toxins, and supramolecular structures
- IDM-BACP-0700 Role of bacterial behavior and developmental processes in the host pathogen interaction, including: biofilms, chemotaxis, sporulation, and stress responses
- IDM-BACP-0701 Mechanisms of persistence and transmission
- IDM-BACP-0702 Ecology of bacterial pathogens including the composition of the indigenous microbiota and its role in health and disease
- IDM-BACP-0703 Animal models of infection

Clinical Research and Field Studies of Infectious Diseases - CRFS

Descrizione SS

The Clinical Research and Field Studies of Infectious Diseases [CRFS] Section reviews applications that address population-based studies on the emergence, spread, control, and prevention of infectious diseases (including potential agents of bioterrorism) that affect humans.

IDM-CRFS-0704	Design and execution of investigator-initiated clinical studies for testing agents or strategies for preventing or treating infectious diseases
IDM-CRFS-0705	Identification of factors involved in the pathogenesis, emergence and spread of infectious diseases.
IDM-CRFS-0706	Diagnostics for the detection, identification, and surveillance of infectious diseases
IDM-CRFS-0707	Molecular epidemiology of infectious diseases, including genetic characterization of both the pathogen and the host
IDM-CRFS-0708	Studies that address the potential infectious etiology of human disease

IDM - DDR

Drug Discovery and Mechanisms of Antimicrobial Resistance - DDR

Descrizione SS

The Drug Discovery and Mechanisms of Antimicrobial Resistance [DDR] Section reviews applications that are concerned with the identification of novel antimicrobial, antifungal, and antiparasitic agents for the prevention and treatment of infectious diseases and the study of the evolution, mechanisms, and transmission of resistance.

IDM-DDR-0709	Drug discovery: drug target identification, characterization and validation; novel screening methods and assay development; molecular and medicinal chemical characterization of inhibitors; structure-guided drug design; preclinical studies using animal models
IDM-DDR-0710	Antimicrobial resistance: mechanisms and regulation of antimicrobial resistance; emergence, dissemination, and maintenance of resistance; strategies for the prevention of resistance; molecular characterization of resistant pathogens
IDM-DDR-0711	Development of procedures and/or instruments for the detection of antimicrobial resistant organisms, diagnosis, and treatments of infectious diseases
IDM-DDR-0712	Viral gene delivery, expression vectors, and phage therapy

IDM - F13

Infectious Diseases and Microbiology Fellowship - F13

Descrizione SS

The F13 Special Emphasis Panel reviews fellowship applications involving virology and viral pathogenesis, bacteriology and bacterial pathogenesis, fungal pathogenesis, parasitology and parasitic diseases, the innate and adaptive host responses to these microbes and viruses, and the development of anti-infective agents to treat and prevent infectious disease.

IDM-F13-0765	Genetics, biochemistry, structure, physiology and behavior of bacteria, archaea, and their phages
IDM-F13-0766	Mechanisms of bacterial commensalism, infection, and disease
IDM-F13-0767	Bacterial factors that alter/affect host cells, or the host aspect of the host pathogen interaction
IDM-F13-0768	Protozoal, helminthic, and fungal pathogens in humans, and animal models
IDM-F13-0769	Viral structure, genetics, infection and replication; cellular and host responses to viral and prion infections; and mechanisms of disease pathogenesis in plants, animals, and humans
IDM-F13-0770	Studies on the emergence, spread, control, and prevention of infectious diseases that affect humans
IDM-F13-0771	The identification of novel antimicrobial agents, for the prevention and treatment of infectious diseases and the study of the evolution, mechanisms, and transmission of resistance
IDM-F13-0772	All aspects of arthropod and molluscan intermediate hosts of parasitic, viral, and bacterial pathogens, including model systems, where the intent is to yield information relevant to human diseases

Descrizione SS

The Host Interactions with Bacterial Pathogens [HIBP] Section reviews applications involving studies that focus on bacterial factors that alter/affect host cells, or the host aspect of the host pathogen interaction.

- IDM-HIBP-0713 Molecular basis for bacteria-host interactions including: in vivo survival and growth, intracellular replication dissemination, intercellular spread
- IDM-HIBP-0714 Immune response of the host to bacteria, characterization of the role of immunomodulators and effector molecules in pathogenicity, manipulation and evasion of innate and adaptive immune responses
- IDM-HIBP-0715 Interplay between bacteria and host cell components and processes, subversion and manipulation of normal host cell processes
- IDM-HIBP-0716 Mechanisms of asymptomatic colonization and the balance between infection and disease, and commensalism and pathogenicity
- IDM-HIBP-0717 Animal models of infection and disease, including host genetic determinants of susceptibility and resistance and surrogate hosts

Descrizione SS

The Pathogenic Eukaryotes [PTHE] Section reviews applications involving protozoal, helminthic, fungal pathogens in humans and animal models.

- IDM-PTHE-0718 Mechanisms of pathogenesis including: pathogen-host cell receptor interactions, signaling pathways in both host cell and pathogen, molecular mechanisms of virulence, manipulation of host cell biological pathways, and factors associated with asymptomatic infection and/or commensalisms
- IDM-PTHE-0719 Primary host defenses including: genetic basis of host resistance and susceptibility to infection and disease, induction and regulation of innate and acquired immunity, evasion of host immune response
- IDM-PTHE-0720 Biochemical processes of the pathogen including: metabolism, enzymology, physiology, and replication
- IDM-PTHE-0721 Identification and preclinical validation of potential chemotherapeutic targets and diagnostic strategies
- IDM-PTHE-0722 Pathogen cell biology including: novel organelles, secretory processes, and mechanisms of motility
- IDM-PTHE-0723 Pathogen differentiation, morphogenesis, and developmental processes required for the infectious cycle including transmission and persistence
- IDM-PTHE-0724 Genetic processes including: gene structure, regulation of gene expression, molecular evolution, genetic diversity, and improved genetic methodology
- IDM-PTHE-0725 Functional genomics, comparative genomics, proteomics, and other broad-based technologies for studying genomes
- IDM-PTHE-0726 Improved models of infectious cycles and diseases

Descrizione SS

The Non-HIV Infectious Agent Detection/Diagnostics, Food Safety, Sterilization/Disinfection and Bioremediation section [SBID] considers Small Business Innovation Research [SBIR] and Small Business Technology Transfer Research [STTR] grant applications that deal with detection and diagnostics of bacteria, non-HIV viruses, fungi, parasites and prions. Grant applications focused on non-HIV infectious agents and toxins that are contaminating food are also considered; emphasis may include technologies to protect food and water from infectious contamination, as well as sterilization and bioremediation technologies.

- IDM-SBID-0760 Innovations in methods or technologies for the detection or quantitation of bacteria, non-HIV viruses, eukaryotic pathogens, and prions
- IDM-SBID-0761 Study of bacterial biofilms as related to human disease; development of agents or methods to combat biofilms in vivo and on medical devices
- IDM-SBID-0762 Detection and Inactivation of pathogens and toxins in food or drinking water

- IDM-SBID-0763 Advances in sterilization, decontamination or disinfection technologies
- IDM-SBID-0764 Development of novel applications for bioremediation

IDM - *SBN* Small Business: Non-HIV Anti-Infective Therapeutics - SBN

Descrizione SS The Non-HIV Anti-Infective Therapeutics section SBN reviews Small Business Innovation Research [SBIR] and Small Business Technology Transfer Research [STTR] grant applications that focus on the development of therapeutic agents to combat bacterial, viral, fungal, parasitic, prion infections and disease vectors.

- IDM-SBN-0757 Development and/or testing of novel anti-infective agents or of therapeutic process to fight infective agents using culture systems or animal models.
- IDM-SBN-0758 Development of traps, biocides or pesticides active against infectious disease vectors.
- IDM-SBN-0759 Development of processes to optimize industrial production of non-HIV anti-infective agents.

IDM - *VB* Vector Biology - VB

Descrizione SS The Vector Biology [VB] Section reviews applications on all aspects of arthropod and molluscan intermediate hosts of parasitic (e.g., nematode, helminth, or protozoa), viral, and bacterial pathogens, including model systems, where the intent is to yield information relevant to human diseases.

- IDM-VB-0727 Basic biology, biochemistry, physiology, immunology, and ecology with relevance to vector-borne human pathogens
- IDM-VB-0728 Genetics and population genetics of vectors
- IDM-VB-0729 Genomics, including comparative and functional genomics, and proteomics
- IDM-VB-0730 Improvements of genetic and immunological technologies and their application in areas such as reducing vector capacity (including transgenic, selected gene silencing and knockout) and blocking parasite transmission
- IDM-VB-0731 Host immune responses to vectors, including pharmacological aspects of arthropod salivary and other secretory products
- IDM-VB-0732 Vector/pathogen/host interactions :Vector competence, including biochemical and genetic processes in pathogen/vector interactions
- IDM-VB-0733 Vector/pathogen/host interactions :Pathogen impact on host fitness
- IDM-VB-0734 Vector/pathogen/host interactions :Laboratory-based pathogen development and transmission
- IDM-VB-0735 Vector/pathogen/host interactions :Vector immune responses to pathogens and surrogate vector systems
- IDM-VB-0736 Vector/pathogen/host interactions :Molecular basis of transmission interference including identification of molecular and cellular targets
- IDM-VB-0737 Development, laboratory evaluation, and field-based testing of approaches to control vectors and disease transmission
- IDM-VB-0738 Arthropod symbionts and their use in introducing genes that encode anti-microbial products
- IDM-VB-0739 Development of methods for maintaining arthropods in the laboratory

IDM - *VIRB* Virology A & B Study Sections - VIRA & VIRB

Descrizione SS The Virology [VIRB] Section review applications addressing fundamental aspects of non-HIV and non-bacteriophage viral genetics, infection and replication; cellular and host responses to viral infections; and mechanisms of disease pathogenesis in plants, animals, and humans. In general, applications with a focus on biophysics aspects of virology or structural biology will be assigned to VIRA and those addressing viral immunity will be assigned to VIRB.

- IDM-VIRB-0740 Cellular and molecular biology of viral replication: attachment and entry; gene expression and regulation; viral genome replication; viral assembly and maturation; egress
- IDM-VIRB-0741 Virus-host cell interactions: effects on signal transduction; host gene expression; cellular physiology and metabolism; production of interferons, cytokines and chemokines; cytopathology; apoptosis

- IDM-VIRB-0742 Host responses to virus infection: identification of determinants of susceptibility or resistance; mechanisms of viral clearance; establishment of latency and persistence; animal models of host response
- IDM-VIRB-0743 Viral determinants of disease: virulence and attenuation; viral tropism; spread within the host; transmission; mechanisms of immune evasion; animal models of pathogenesis; viral variation and evolution; transformation and oncogenesis; effects of viral co-infection
- IDM-VIRB-0744 Viral etiology of chronic disease: identification and detection of viruses associated with chronic disease; validation of etiology; animal models of virus-induced chronic disease
- IDM-VIRB-0745 Identification of new molecular targets relevant to viral pathogenesis: genomics and proteomics; new approaches to identify cellular changes relevant to pathogenic mechanisms

IDM - *ZRDM*

Topics in Bacterial Pathogenesis Special Emphasis Panel - ZRDM

Descrizione SS

The Topics in Bacterial Pathogenesis Special Emphasis Panel [ZRDM] reviews (no other area) application mechanisms that would otherwise be reviewed by either the Bacterial Pathogenesis (BACP) or Host Interactions with Bacterial Pathogens (HIBP) Sections. Accordingly, it reviews applications involving bacterial infections and host pathogen interactions.

- IDM-ZRDM-0746 Bacteria-host interactions including adherence, invasion, multiplication, dissemination, and host immune responses
- IDM-ZRDM-0747 Genetic, biochemical and physiological characterization of bacterial survival, growth, and pathogenesis
- IDM-ZRDM-0748 Evasion of the innate and adaptive immune response
- IDM-ZRDM-0749 Asymptomatic colonization and the balance between infection and disease, commensalisms, and pathogenicity
- IDM-ZRDM-0750 Animal models of infection and disease
- IDM-ZRDM-0751 Role of indigenous microbiota in health and disease
- IDM-ZRDM-0752 Pathogen-related bacterial behavior and development including biofilms, chemotaxis, sporulation, and stress responses
- IDM-ZRDM-0753 Ecology of bacterial pathogens
- IDM-ZRDM-0754 Role of extrachromosomal elements in pathogenesis
- IDM-ZRDM-0755 Exploration of small molecules, immunomodulators and drugs as modulators and regulators of virulence
- IDM-ZRDM-0756 Role of bacterial agents in noninfectious diseases

Descrizione IRG:

The ten study sections comprising the Integrative, Functional, and Cognitive Neuroscience [IFCN] Group review applications within a very wide range of neuroscience research aimed at furthering our understanding of how the nervous system is organized and functions at an integrative, systems level. Specific areas reviewed by the IFCN Group include: studies of the neural basis of emotional and motivational behavior; regulation of function, at the systems level, by neuroendocrine and neuroimmune influences; the analysis of system function under varying behavioral states, such as sleep and hibernation; the basis of biological rhythms; the maintenance of homeostasis; chemosensation, hearing, balance, touch, somatosensation, and visual perception; motor systems and sensorimotor integration; the integration of multisensory information; the neurobiological basis of learning, memory and other cognitive processes; computational and theoretical models of cognitive processes; mechanisms underlying neural coding of complex stimuli (e.g., pattern recognition, spatial transformations, speech perception); and attention and its effects on information processing in the nervous system. Research proposed in applications reviewed in the IFCN Group may have relevance to disorders or disease processes, but the emphasis would be on the effect of the process on the structure or function of the system under investigation, rather than on the disease process itself.

IFCN - AUD

Auditory System - AUD**Descrizione SS**

The Auditory System [AUD] Section reviews applications on the structure and function of the auditory and vestibular systems using a variety of approaches.

IFCN-AUD-0773

Auditory system/hearing: anatomy, physiology, pharmacology, development, maturation, plasticity, disorders, the diagnosis and treatment of auditory disorders, and device assessment using approaches ranging from molecular/cellular to systems/whole organism.

IFCN-AUD-0774

Vestibular system/end organ: anatomy, physiology, pharmacology, development, maturation, plasticity, and neuro-otological disorders using approaches ranging from molecular/cellular to systems/whole organism.

IFCN - BRS

Biological Rhythms and Sleep - BRS**Descrizione SS**

The Biological Rhythms and Sleep (BRS) Section reviews applications on the neurobiological basis of biological rhythms including sleep. Proposed studies typically examine molecular, cellular, circuit and system mechanisms responsible for the generation, synchronization, entrainment and modulation of the various rhythms and or their functional role(s). The development, maturation and aging of biological rhythms are considered, as well as plasticity in the adult. BRS primarily considers research with animal models, but relevant work with humans is also included.

IFCN-BRS-0775

Biological rhythms: neurobiology of circadian and other rhythms in activity, reproduction and sleep-wakefulness, including pacemaker mechanisms and output pathways.

IFCN-BRS-0776

Sleep neurobiology: neural mechanisms that generate and maintain sleep in animal and human models.

IFCN - COG Cognitive Neuroscience - COG

Descrizione SS The Cognitive Neuroscience [COG] Section reviews a broad range of applications on the neurobiological mechanisms and principles underlying cognitive functions other than learning and memory. Particular emphasis is placed on studies that directly relate behavioral/cognitive processes to their neural substrates. Multiple approaches and methodologies are appropriate including electrophysiology, anatomy, EEG, fMRI, MEG, psychophysics, behavioral testing, pharmacological intervention and theoretical/computational modeling.

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- IFCN-COG-0782 Perception and sensory motor integration: pattern and object recognition in all sensory domains, multi-sensory integration, cross-modal plasticity, decision-making and motor planning.
 - IFCN-COG-0783 Attention: influences of attention on information flow within the brain in human and animal studies.
 - IFCN-COG-0784 Language and speech perception: cortical function in language and speech represented in neural activity.
 - IFCN-COG-0785 Other cognitive functions: executive processes, conscious versus non-conscious processing, imagery, hemispheric specialization, and emotional and motivational processes that influence cognitive function

IFCN - CVP Central Visual Processing - CVP

Descrizione SS The Central Visual Processing [CVP] Section reviews applications for basic, clinical and applied research investigating normal and impaired visual perception, gaze control and the responsible circuits and structures of the eye and brain.

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- IFCN-CVP-0786 Visual perception of brightness, color, form, motion, depth, patterns and objects as well as visual navigation.
 - IFCN-CVP-0787 Movements of the eyes including gaze shifting and accommodation
 - IFCN-CVP-0788 Structure, connectivity, and function of cortical and subcortical regions during development, adulthood and aging probed with systems, cellular, and molecular techniques as well as computational models.
 - IFCN-CVP-0789 Strabismus, amblyopia, myopia, low vision, disorders of gaze, and enhancing or rehabilitating visual impairments through optical aids or training methods

IFCN - LAM Neurobiology of Learning and Memory - LAM

Descrizione SS The Neurobiology of Learning and Memory [LAM] Section reviews applications on the neurobiological structures, mechanisms, and principles underlying learning, memory, and associated neural plasticity. The scope of this committee is broad, including studies of the molecular and cellular changes, functional circuitry, and neural coding and integration that underlie learning and memory processes. Most importantly, all studies appropriate for LAM directly relate neural substrates to behavioral/cognitive processes.

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- IFCN-LAM-0790 Functional circuitry: anatomical pathways and behavioral physiology of brain structures that mediate learning and memory.
 - IFCN-LAM-0791 Neural correlates of learning and memory: neural activity, assessed by single neuron and population firing patterns and imaging, associated with learning and memory.
 - IFCN-LAM-0792 Cellular plasticity: understanding cellular events that underlie plasticity related to learning and memory.
 - IFCN-LAM-0793 Molecular/genetic approaches: molecular and genetic mechanisms underling specific aspects of learning and memory function.
 - IFCN-LAM-0794 Development and aging: neurobiological mechanisms behind development and age-related changes in learning and memory capacity.
 - IFCN-LAM-0795 Theoretical modeling: synaptic plasticity, neural circuitry, and interactions among brain structures that affect learning and memory performance
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Descrizione SS

The Neurotoxicology and Alcohol [NAL] Section addresses the effects of environmental toxicants (such as pesticides or metals) or alcohol on the central nervous system.

- IFCN-NAL-0796 Neuropharmacology/toxicology; neurophysiology: effects of acute or chronic exposure to environmental toxins or alcohol on the central nervous system primarily using animal or in vitro models.
- IFCN-NAL-0797 Behavioral pharmacology/behavioral toxicology: effects of acute or chronic exposure to environmental toxins or alcohol on behavior with a focus on the underlying behavioral and neural mechanisms primarily in animal models. Along with issues of tolerance and dependence for alcohol, this includes craving and initiation and reinforcement of drinking.
- IFCN-NAL-0798 Neuroteratology: effects of acute or chronic prenatal or early exposure to environmental toxins or alcohol on the central nervous system, primarily in animal models

Descrizione SS

The Neurobiology of Motivated Behavior [NMB] Section reviews applications examining the neuronal circuits critical to the mediation of rewarding and negatively motivated behaviors. Studies reviewed by NMB utilize molecular, cellular, anatomical, and behavioral techniques, however the emphasis of these application is the neurobiological mechanisms underlying the mediation of motivated behavior.

- IFCN-NMB-0799 Positively motivated behaviors: Includes the mediation of drug and other types of reward; mechanisms of tolerance, dependence, withdrawal, and sensitization, as well as predisposing factors leading to drug seeking and relapse.
- IFCN-NMB-0800 Stress, fear, anxiety, aggression: Examines critical molecules and circuits involved in the mediation of negatively motivated behavior; also, mechanisms of habituation and sensitization leading to altered responsiveness to stressful and aversive stimuli.
- IFCN-NMB-0801 Feeding, drinking, sexual and other consummatory or social behaviors: Limbic and related circuits are investigated to determine their respective roles in the mediation of such behavior; as well as mechanisms of plasticity, and predisposing factors which may shape such behavior.
- IFCN-NMB-0802 Neurobiological actions of psychoactive/psychotherapeutic agents: Includes molecular and cellular mechanisms of action of psychoactive drugs on behavior

Descrizione SS

The Neuroendocrinology, Neuroimmunology and Behavior (NNB) Section reviews applications on the neurobiological basis of behavior with a focus on neuroendocrine and neuroimmune systems. Studies typically use behavioral, physiological, pharmacological, anatomical and developmental approaches, but may include cellular, molecular or genetic approaches. The development, maturation and aging of the neuroendocrine and neuroimmune systems are considered, as well as plasticity in the adult. NNB primarily considers research with animal models, but relevant work with humans is also included.

- IFCN-NNB-0803 Reproductive neuroendocrinology: neuroendocrinology of the hypothalamic-pituitary-gonadal axis and associated reproductive behaviors,
- IFCN-NNB-0804 Stress neuroendocrinology: neuroendocrinology of the hypothalamic-pituitary-adrenal axis and associated stress, anxiety and depressive behaviors,
- IFCN-NNB-0805 Affiliative neuroendocrinology: neuroendocrinology of oxytocin, vasopressin and prolactin secretion and associated maternal, affiliative and social behaviors,
- IFCN-NNB-0806 Ingestive behavior: neural regulation of food and fluid intake and whole body energy homeostasis,
- IFCN-NNB-0807 Neuroimmunology: interactions between the nervous and immune systems and associated sickness and depressive behaviors

Descrizione SS

The Somatosensory and Chemosensory Systems [SCS] Section reviews research on the anatomy, physiology and psychophysics of chemosensory, pain, analgesia and somatosensory systems in animals and humans. The emphasis is on integrative systems approaches to understanding normal sensory function.

- IFCN-SCS-0808 Chemosensation: olfaction, taste, vomeronasal and trigeminal chemosensory systems studied with approaches ranging from molecular techniques to human psychophysics.
- IFCN-SCS-0809 Pain, itch and analgesia: mediation and modulation of nociception looking at critical circuits - spinal and supraspinal important in pain sensation.
- IFCN-SCS-0810 Touch, temperature, and vibrotactile sensation: neurobiological aspects of somesthesia

IFCN - SECF

Chronic Fatigue Syndrome/ Fibromyalgia Syndrome Special Emphasis Panel - SECF**Descrizione SS**

The Chronic Fatigue Syndrome/ Fibromyalgia Syndrome [SECF] reviews applications in the multiple disciplines applied to studies of the causes, manifestations and treatments of the Chronic Fatigue Syndrome, the Fibromyalgia Syndrome and other chronic polysystemic morbidity syndromes.

- IFCN-SECF-0778 Etiopathogenesis and diagnosis
- IFCN-SECF-0779 Ameliorative and therapeutic interventions
- IFCN-SECF-0780 Health Services
- IFCN-SECF-0781 Disciplines involved/evaluated, include aspects of Allergology, Alternative Medicine, Behavioral Sciences, Chiropractic Medicine, Diagnostic Laboratory Sciences, Epidemiology, Homeopathic Medicine, Immunology, Infectious Diseases, Internal Medicine, Medicinal Chemistry, Microbiology, Neurology, Occupational Therapy, Osteopathic Medicine, Pharmacology, Physical Therapy, Psychiatry, Psychology, Psychopharmacology, Rheumatology, and Virology

IFCN - SMI

Sensorimotor Integration - SMI**Descrizione SS**

The Sensorimotor Integration [SMI] Section reviews applications concerned with the structure and function of motor, sensorimotor, and vestibular systems, involving neurophysiological, molecular/genetic, biochemical, neuroanatomical, biophysical, behavioral, bioengineering and computational approaches. Emphasis is on integrative systems approaches to elucidating neural substrates of motor control.

- IFCN-SMI-0811 Cortical and cerebellar motor control: anatomy and physiology of cortical and cerebellar microcircuitry involved in voluntary and involuntary movements; reaching and grasping; cortical control of neuroprosthetics; premotor information processing; oral motor control including jaw and tongue movements.
- IFCN-SMI-0812 Spinal and brainstem motor control: anatomy and physiology of spinal circuitry; locomotor mechanisms; motor central pattern generators; respiratory central pattern generators.
- IFCN-SMI-0813 Basal ganglia/subcortical systems motor control: anatomy, biophysics and neurophysiology of basal ganglia neurons and nuclei; subcortical substrates of sequential and learned movements; interactions of basal ganglia and cortical circuits.
- IFCN-SMI-0814 Integration and coordination of sensory and motor signals: invertebrate and vertebrate models of sensorimotor integration including neural mechanisms of active whisking, escape behaviors, proprioception; birdsong vocal motor control and learning.
- IFCN-SMI-0815 Spatial orientation, balance and postural control: vestibular systems anatomy, neurophysiology and behavior; oculomotor control, especially vestibulo-ocular reflex; vestibulo-spinal reflex; neural control and biomechanics of stance in human and animal models.

Descrizione IRG:

The Immunology [IMM] Group reviews applications that seek an understanding of the immune system's role in hosts' interactions with infectious agents, tumor cells, transplanted cells, self components, the conceptus/fetus, allergens, and environmental exposures; mechanisms, prevention, and treatment of diseases when the immune system has a major role; the evolution, comparative biology, development, structure, aging, and malfunction of the immune system; the molecular, cell, organ, and organismal biology of the immune system; the biophysical and structural analysis of antigens and immune system products and components; the interactions of the immune system with other organs, such as the nervous and endocrine systems; and the participation in immunity by non-lymphohematopoietic tissues and cells, such as epithelia.

IMM - F07**Immunology Fellowships and Area - F07****Descrizione SS**

F07 reviews fellowship applications where the focus is an understanding of the role of the immune system in the host interaction with infectious agents, tumor cells, transplanted cells, self-components, the conceptus/fetus, allergens, and with substances encountered through environmental exposure.

IMM-F07-0871	Mechanisms, prevention, and treatment of diseases when the immune system has a major role
IMM-F07-0872	Evolution, comparative biology, development, structure, aging, and malfunction of the immune system
IMM-F07-0873	Molecular, cell, organ, and organismal biology of the immune system
IMM-F07-0874	Biophysical and structural analysis of antigens and immune system products and components
IMM-F07-0875	Interaction of the immune system with other organs, such as the nervous and endocrine systems
IMM-F07-0876	Participation in immunity by non-lymphohematopoietic tissues and cells, such as epithelia
IMM-F07-0877	Clinical development of vaccines and monoclonal antibodies for immunotherapy

IMM - HAI**Hypersensitivity, Autoimmune, and Immune****Descrizione SS**

The Hypersensitivity, Autoimmune, and Immune-mediated [HAI] Diseases Section reviews applications concerned with basic, pre-clinical, and clinical investigations, involving autoimmune diseases, hypersensitivity and allergic diseases, asthma, primary and secondary states of immunodeficiency syndrome (non-AIDS), and inflammatory diseases. Emphasis is on the etiology, initiation, immunopathophysiology, prevention and treatment of diseases in which the immune system (innate and adaptive) is the major contributor. Approaches include human studies, in vitro studies of patient materials, animal models, and genomic and proteomic approaches to immune-mediated disease questions.

IMM-HAI-0827	Etiology of immune-mediated diseases: hormonal, developmental, environmental factors (infectious and non-infectious) and lifestyle factors, and genetic.
IMM-HAI-0828	Initiation of immune-mediated diseases: activation of innate and antigen specific responses, co-stimulators, cytokine regulation/polarization, regulatory cells and recruitment of inflammatory cells.
IMM-HAI-0829	Immunopathophysiology of immune-mediated diseases: the balance of effector and regulatory factors and cells as well as mechanisms of tissue damage leading to chronicity, remission or relapse, and genetic and exogenous factors modulating disease expression.
IMM-HAI-0830	Immune-mediated diseases arising as a consequence of aging.

- IMM-HAI-0831 Treatment of immune-mediated diseases: antigen specific and non-specific drug and biologic approaches to tolerance to self or foreign antigens including vaccination, gene therapy, peptide and altered ligand approaches as well as cell-based approaches; development of biomarkers of disease and related activities, and outcome assessments in clinical studies; determinants of response to therapy.
- IMM-HAI-0832 Prevention of immune-mediated diseases: identification of at-risk populations, immunology of genetic and environmental factors, and interventions aimed at altering the immune response so as to modify or prevent disease expression

IMM - IHD **Immunity and Host Defense - IHD**

Descrizione SS The Immunity and Host Defense [IHD] Section covers the interface between the immune response and the microbial milieu. As such it reviews applications concerned with the innate and adaptive immune responses to a wide variety of pathogens and commensals, including viruses, bacteria, fungi, and parasites. Emphasis is on the innate, systemic and mucosal immune responses to these microbial organisms, in animal models and humans.

- IMM-IHD-0833 host-microbe interactions: innate and acquired host immune responses to specific pathogenic organisms including viruses, bacteria, fungi and parasites; host responses to commensal microbes; influence of host factors, including genetic predisposition or resistance to infection.
- IMM-IHD-0834 innate immunity to microorganisms: cells, receptors, cytokines, chemokines, and soluble mediators that provide early protection from injury due to pathogens and their products or responses to commensal organisms. Innate immune cells including but not limited to NK cells, phagocytes, gamma/delta and NK T cells, B-1 cells, dendritic cells, and mast cells. Receptors including but not limited to molecules expressed by these cells engaged in innate immunity, including chemokine and other G-protein coupled receptors, Toll-like receptors, NK cell activation and inhibitory receptors, phagocytic receptors, pattern recognition receptors, Fc receptors, adhesion receptors, co-stimulatory molecules, and cytokine receptors.
- IMM-IHD-0835 mucosal immunity: host immune responses in mucosal sites to specific pathogens, including viruses, bacteria, fungi and parasites and regulation by commensal microbes. Induction and modulation of mucosal immune responses. Comparison of mucosal immunity versus systemic immunity, differentiation of immune responses in the mucosa and peripheral lymphoid tissues, and immune cell migration to mucosal sites including inductive and effector sites.
- IMM-IHD-0836 host defense: innate and acquired immune responses that protect the host from deleterious effects of pathogens, including basic mechanisms of immune responses to limit pathogen invasion and toxicity, and development of animal models of potential bioterrorism agents.
- IMM-IHD-0837 immune response to vaccines and gene therapy agents: immune responses to vaccines, both vector and cell based vaccines and immune responses that limit the treatment through gene transfer, including response to gene therapy vectors and gene products

IMM - III **Innate Immunity And Inflammation - III**

Descrizione SS The Innate Immunity and Inflammation Section reviews applications involving basic aspects of innate immunity and inflammation, including studies of soluble and cellular mediators of these processes.

- IMM-III-0838 effector functions of innate immune cells (e.g., neutrophils, monocytes, macrophages, dendritic cells, NK cells, basophils, eosinophils, mast cells, gdT cells, B1 cells)
- IMM-III-0839 pattern recognition receptors and ligands
- IMM-III-0840 recruitment and activation of non-lymphocyte leukocytes
- IMM-III-0841 structure, function, and release of anti-microbial peptides
- IMM-III-0842 adhesion molecules, chemotaxis, endothelial responses
- IMM-III-0843 cytokines, chemokines, lipid mediators, other autocoids, and their receptors
- IMM-III-0844 animal and plant systems of innate immunity and inflammation
- IMM-III-0845 immunotoxicology and effects of environmental agents on the immune system
- IMM-III-0846 systemic and tissue specific responses to inflammation
- IMM-III-0847 regulation of adaptive immune responses
- IMM-III-0848 initiation of host responses in skin, mucosal, and privileged sites
- IMM-III-0849 complement and other soluble host defense proteins and their regulation
- IMM-III-0850 immunodeficiencies involving the inflammatory and innate immune system

Descrizione SS

The Immunology Integrated Review Group IMM section reviews Small Business Innovation Research (SBIR) and the Small Business Technology Transfer Research (STTR) grant applications from the small business community in the area of basic immunology. Applications from small businesses which address basic and applied immunology, immunologic therapies, and diseases of immunologic origin are appropriate for review. These applications should project the development of a product, process, or service towards a commercial venture.

IMM-IMM-0865	Antibodies: polyclonal, monoclonal, isolation, selection, characterization, development, production, processing, xenogeneic systems.
IMM-IMM-0866	Immunoassays and immunologic markers: reagents, development, for transplantation, for infectious diseases, for neoplastic diseases, for autoimmune diseases.
IMM-IMM-0867	Immunotherapeutic regimens: for transplantation, for bacterial, viral and fungal infectious diseases, for neoplastic diseases, for autoimmune diseases including allergy, asthma, diabetes, muscular sclerosis, systemic lupus erythematosus, rheumatoid arthritis, myasthenia gravis, glomerulonephritis.
IMM-IMM-0868	Cellular immune system: reagents for identification, characterization, and modulation of B lymphocytes, T lymphocytes, dendritic cells, eosinophils, stem cells, bone marrow, lymph nodes, mast cells, antigen-presenting cells, cytotoxic cells.
IMM-IMM-0869	Innate immune system: reagents for identification, characterization, and modulation of complement, monocytes, macrophages, neutrophils, basophils, natural killer cells.
IMM-IMM-0870	Immunomodulation of the immune system interactions: suppression, enhancement, biologics including cytokines, small molecules, proteins/peptides

Descrizione SS

The Cellular and Molecular Immunology - A (CMIA) Section reviews applications concerned with understanding the molecular, structural, biochemical and biophysical aspects of immunology. The focus is primarily on the adaptive arm of the immune system but to some extent, the innate immune arm as well.

IMM-MIA-0816	the cellular, biochemical, structural and biophysical, and extra- and intracellular molecular events of T and B lymphocytes and other cells (dendritic and mast cells) involved in the adaptive and innate immune responses.
IMM-MIA-0817	cell/cell interactions, cell migration, signal transduction T and B cell receptors, costimulatory molecules, Fc high and low affinity receptors, cytokine and chemokine receptors.
IMM-MIA-0818	antigen processing and presentation, T cell receptor (TCR)\major histocompatibility complex (MHC)-peptide interactions.
IMM-MIA-0819	the mechanisms and regulation of VDJ recombination of TCR and immunoglobulin (Ig) genes, isotype switching and the somatic hypermutation of immunoglobulin genes.
IMM-MIA-0820	transcriptional, posttranscriptional, translational and posttranslational regulation of genes involved in lymphocyte development, differentiation, or response to environmental signals or cytokines

Descrizione SS

The Cellular and Molecular Immunology B Section reviews applications concerned with the function and structure of the adaptive immune system. Emphasis is on the activation, developmental, differentiation and interactions of the cells and organs of immune system on the molecular and cellular levels.

IMM-MIB-0821	molecular and cellular regulation during early and peripheral lymphoid cell development such as T cells, B cells, NK cells, NKT cells, regulatory T cells, and myelo/hematopoiesis and apoptosis involved during these processes.
IMM-MIB-0822	mechanisms of lymphoid repertoire formation during development, activation, differentiation and aging especially VDJ recombination in T cell receptor, B cell receptor and immunoglobulin (Ig) genes, isotype switching and somatic hypermutation of Ig genes.
IMM-MIB-0823	initiation and recall of adaptive immune responses, including antigen processing and presentation, interactions with innate immunity, signal transduction and transcriptional regulation in lymphocyte activation, and cytokine signaling and function.

IMM-MIB-0824	dynamics of the immune response, including homeostasis, regulation and memory in primary and secondary lymphoid organs (e.g. bone marrow, thymus, lymph nodes, spleen, liver, GALT).
IMM-MIB-0825	mechanisms of disorders during lymphocyte development, activation and differentiation that lead to immunodeficiency diseases.
IMM-MIB-0826	comparative immunology in non-mammalian animals

IMM - *NHIV*

SBIR none HIV

Descrizione SS

The Immunologic Sciences NHIV section reviews grant applications from the small business community in the area of non-HIV microbial vaccine development for the Small Business Innovation Research (SBIR) and the Small Business Technology Transfer Research (STTR) Programs. Applications from small businesses that address basic and applied studies in the design, development, production, and evaluation of candidate vaccines against microbial-caused diseases are appropriate for review in this panel. The applications should project the development of a product, process, service, or platform technology that can be developed as a commercial venture. NHIV also reviews the adaptation or fabrication of vaccine delivery systems and adjuvant systems. The panel does not review grant applications proposing development of vaccines against HIV or AIDS.

IMM-NHIV-0859	All types of vaccines against diseases caused by bacteria, fungi, viruses (except HIV), and parasites, including live attenuated viral/bacterial vaccines, inactivated whole-organism vaccines, subunit vaccines, recombinant protein-based vaccines, vector-based vaccines, polysaccharide vaccines, conjugate vaccines, DNA vaccines, synthetic vaccines, mimetic vaccines, plant-derived vaccines, combination vaccines, etc.
IMM-NHIV-0860	Vaccine design: antigen selection, epitope selection and design, use of adjuvant, use of vectors and chimeric carriers, vaccine formulation.
IMM-NHIV-0861	Vaccine evaluation: immunogenicity, efficacy, safety, longevity, and use of animal models.
IMM-NHIV-0862	Vaccine delivery systems: bacterial and viral vectors, chimreic vaccine carriers, liposome, nanoparticles.
IMM-NHIV-0863	Adjuvants for specific vaccines.
IMM-NHIV-0864	Vaccine production: production methodologies, process development/optimization/scale-up, GMP production and clinical material manufacturing

IMM - *TTT*

Transplantation, Tolerance and Tumor Immunology - TTT

Descrizione SS

The Transplantation, Tolerance and Tumor Immunology (TTT) Section reviews applications involving the making and breaking of immune tolerance. This includes human and animal studies of immune-mediated transplant rejection, basic mechanisms of acquired immune tolerance, and studies of tumor immunology and vaccine development. Emphasis is on immune mechanisms.

IMM-TTT-0851	Transplantation: studies of transplant rejection when the major focus is on the immune response to the transplanted organ and immune mechanisms behind immunosuppressive drugs and therapies for prevention of transplant rejection; solid organ and hematopoietic transplant tolerance, in both small and large animal models as well as clinical studies and clinical trials; mechanisms of development and strategies for prevention of graft vs. host disease, including promotion of graft vs. tumor/leukemia effects.
IMM-TTT-0852	Tolerance: mechanisms of immune tolerance, both central and peripheral, using a variety of systems including engineered mice and tumor, autoimmune, or transplant models.
IMM-TTT-0853	Tumor Immunology: immune surveillance, mechanisms of immune evasion, or immune suppression in the tumor microenvironment, in both humans and animal models; identification of new tumor associated antigens; early stage development and testing of tumor vaccines in animal models.

IMM - *VMD*

Vaccines Against Microbial Diseases - VMD

Descrizione SS

The Vaccines against Microbial Diseases [VMD] Section reviews applications regarding the immune responses against pathogens other than HIV and the development of safe and effective vaccines against these pathogens. The science reviewed involves multiple approaches, namely immunological, molecular biological, biochemical, bioinformatic, genetic, structural biological, nano-technological, computational biological, and microarray technological.

IMM-VMD-0854	Immunological characterization: antibody neutralization, B and T lymphocyte immune response; dendritic cell, mast cell and macrophages functions; mucosal immunity; cytokine and chemokine function; Fc receptors, Toll-like receptors, CD40 ligand; MHC and HLA molecules.
IMM-VMD-0855	Vaccine against various pathogens: gram positive, gram negative and other groups of bacteria; DNA, RNA viruses; parasites and fungi; bacterial toxins; subviral agents such as prions.
IMM-VMD-0856	Pathogenic components: identification of pathogenic components and polymorphisms; structure analysis; modification of pathogenic components; enhancement of antigenicity of pathogenic components.
IMM-VMD-0857	Vaccine development: adjuvants, conjugates, immunomodulators, platforms, DNA vaccine, peptide and protein vaccine, subunit vaccine, live-attenuated vaccine, plant based vaccine, optimization of vaccine delivery using vectors, plasmids and virus-like particles, nanoparticles, needle or needleless technology.
IMM-VMD-0858	Animal models and humans: small and large animal models; non-human primates; studies using pre-existing human samples; human pre-clinical and clinical assessment of protective immune response; evaluation of immunogenicity, protection, efficacy and safety; improvement of safety of existing vaccine.

IMST

IMST - Interdisciplinary Molecular Sciences and Tr

Descrizione IRG:

The Interdisciplinary Molecular Sciences & Training [IMST] Group reviews crosscutting molecular science applications that focus either on the application of emerging technologies to molecular problems or on training in molecular sciences. The scientific areas are broad and include: biochemistry, biophysics, cancer biology, cell biology, chemistry, and genetics.

IMST - F04A

Fellowship: Chemical and Bioanalytical Sciences - F04A

Descrizione SS

The F04A panel reviews fellowship applications dealing with structure, dynamics, and physical chemistry of macromolecules as they relate to biological function.

IMST-F04A-0923	Chemical synthesis of therapeutic, pharmacological, biological, or biochemical compounds
IMST-F04A-0924	Development and optimization of synthetic reactions, including analysis of reaction mechanisms and kinetics
IMST-F04A-0925	Biosynthetic or biomimetic synthesis of natural products, including design of enzyme substrates or inhibitors
IMST-F04A-0926	Isolation, structural determination, and chemical synthesis of complex natural products
IMST-F04A-0927	Enzyme mechanism studies, including mutagenesis, analyses of transient and transition states, and steady state kinetics
IMST-F04A-0928	Bioinorganic chemistry, including synthesis and properties of coordination compounds and their thermodynamics, kinetics and structures
IMST-F04A-0929	Function and mechanism of metalloproteins, including their spectroscopic characterization
IMST-F04A-0930	Analytical and clinical chemistry, including fabrication methods for biomaterials and biosensor development and development of mass spectrometry, capillary electrophoresis, microfluidics, lab-on-a-chip, and other microfabricated devices
IMST-F04A-0931	RNA enzymology, including catalytic RNA and ribozymes
IMST-F04A-0932	Proteomics, global approaches to protein function, and posttranslational modification
IMST-F04A-0933	Computational data mining for analysis of proteins and related microarrays
IMST-F04A-0934	Physical chemistry of biological macromolecules, including conformation and structure of proteins and nucleic acids
IMST-F04A-0935	Spectroscopic methods, including multi-dimensional nuclear magnetic resonance, X-ray crystallography, Raman and FTIR
IMST-F04A-0936	Protein and nucleic acid folding and conformation by experimental and computational methods
IMST-F04A-0937	Thermodynamics of macromolecular interactions, including isothermal calorimetry

IMST-F04A-0938	Kinetic analyses, including pH or temperature jump methods
IMST-F04A-0939	Structure and physical chemistry of lipid bilayer membranes and related model systems
IMST-F04A-0940	Physical chemical instrumentation, including development of new approaches and application of computers to such instrumentation
IMST-F04A-0941	Indirect methods for structure and dynamics determinations, including fluorescence dye labeling and tethering
IMST-F04A-0942	Carbohydrate biochemistry and glycoproteins, including synthesis and processing
IMST-F04A-0943	Signal transduction at molecular or subcellular levels, including protein structure, function, and enzymology
IMST-F04A-0944	Extracellular matrix at molecular or subcellular levels
IMST-F04A-0945	Motility and cytoskeleton at molecular or subcellular levels

IMST - *F05* **Fellowship: Cell Biology and Development - F05**

Descrizione SS The F05 panel reviews fellowship applications in the broad areas of molecular, cellular and developmental biology when the focus is to understand basic principles of cell structure, function, regulation and differentiation.

IMST-F05-0946	Biogenesis, organization, and functions of the plasma membrane and endomembrane organelles, including transmembrane transport, vesicular transport, macromolecular trafficking, and autophagy
IMST-F05-0947	Cell adhesion, cell polarity, cytoskeleton and cell motility Extracellular matrix, including its biogenesis, organization, and interactions with the cell surface
IMST-F05-0948	Cell cycle and cell growth regulation, cell senescence and cell death (apoptosis), mitosis, meiosis, cytokinesis, telomeres
IMST-F05-0949	Developmental cell biology, including cell fate determination, cellular basis of embryonic patterning, developmental regulation of gene expression, and cell differentiation, germ and stem cell biology
IMST-F05-0950	Protein stability and turnover, including chaperone function and ubiquitin-based degradation and related processes, signal transduction at the cellular level
IMST-F05-0951	Gene expression and its regulation, including chromatin structure, transcription, RNA processing, translation, and RNA stability
IMST-F05-0952	Nuclear organization, including chromosomal organization and nuclear import and export
IMST-F05-0953	Anterior and posterior eye biology (retina and lens)

IMST - *F08* **Fellowship: Genes, Genomes, and Genetics - F08**

Descrizione SS The F08 panel reviews fellowship applications that focus on the genetics and genomics of prokaryotic and eukaryotic systems.

IMST-F08-0954	Bioinformatics, computational biology, and systems biology
IMST-F08-0955	Chromosome structure, function, and gene expression
IMST-F08-0956	Complex genetic traits and diseases
IMST-F08-0957	DNA replication, recombination, and repair (including telomeres, transposable elements, and molecular cell cycle)
IMST-F08-0958	Epigenetics
IMST-F08-0959	Evolution and Population Genetics
IMST-F08-0960	Gene expression and regulation (Transcription, RNA Processing and Translation)
IMST-F08-0961	Genetics of complex diseases and traits
IMST-F08-0962	Modeling and Systems Biology
IMST-F08-0963	Proteomics

Descrizione SS

The F09 panel reviews fellowship applications dealing with the basic, translational, and clinical science of cancer.

IMST-F09-0964	Cancer prevention and diagnosis
IMST-F09-0965	Cancer genetics, genomics, proteomics and biomarkers/signatures
IMST-F09-0966	Cancer etiology, progression, and metastasis
IMST-F09-0967	Gene regulation, oncogenes, tumor suppressor genes, signal transduction pathways in oncogenesis
IMST-F09-0968	Chemical and viral carcinogenesis
IMST-F09-0969	Cancer-related DNA damage and repair, genomic instability
IMST-F09-0970	Signal transduction mechanisms in transformation and tumor progression
IMST-F09-0971	Cancer therapy including immunotherapy, gene therapy, radiation therapy, drug discovery and molecular pharmacology
IMST-F09-0972	Cancer immunology

Descrizione SS

The F14 panel reviews fellowship applications that focus on early stage bioengineering and technology development, before specific practical uses are proven. These applications need not be hypothesis-driven and may focus on the development of specific products, methods, or principles.

IMST-F14-0973	Gene and drug delivery systems
IMST-F14-0974	Biomaterials, biointerfaces, tissue engineering
IMST-F14-0975	Data management and archiving, bioinformatics algorithms, grid computing, ontologies, data mining, representation and visualization
IMST-F14-0976	Mathematical modeling and computational biology
IMST-F14-0977	Instrumentation and systems for the analysis, detection, separation, synthesis, and screening of biological and medicinal molecules and cells
IMST-F14-0978	Microscopic imaging technology; image analysis and management

Descrizione SS

The SBBC section reviews small business applications in the general areas of biological chemistry and biophysics, including bioanalytical technologies, spectroscopic technologies, and technologies that advance high-throughput.

IMST-SBBC-0878	Novel materials, labels and reagents, molecular probes, reporter systems, and surface chemistries
IMST-SBBC-0879	Chemical synthesis
IMST-SBBC-0880	Bioanalytical and spectroscopic technologies
IMST-SBBC-0881	Robotic systems for crystallography and mass spectroscopy
IMST-SBBC-0882	Structural and synthetic biology
IMST-SBBC-0883	Technologies and methods for high-throughput applications, including assays, screens, and large-scale synthesis
IMST-SBBC-0884	Biofuel synthesis and production

Small Business: Biomaterials, Delivery Systems, and Nanotechnology - SBBB**Descrizione SS**

The SBBB section reviews small business applications in the general areas of biomaterials and new strategies, devices, vectors, and agents for delivering genes or drugs into cells or organisms

- IMST-SBBB-0898 Biomaterial characterization and fabrication technologies
- IMST-SBBB-0899 Technologies to address molecular/cellular interfacial interactions
- IMST-SBBB-0900 Implantable technologies with a focus on biocompatibility
- IMST-SBBB-0901 Embryonic stem cell platforms and technologies
- IMST-SBBB-0902 Technologies for gene and drug delivery, including delivery vehicles and manufacturing processes
- IMST-SBBB-0903 Nanotechnology platforms, time release formulations, and other delivery vehicles

Small Business: Computational Biology, Image Processing, and Data Mining - SBCI**Descrizione SS**

The SBCI section reviews small business applications with a dominant focus in computational and mathematical sciences.

- IMST-SBCI-0904 Data management, analytical techniques, and modeling
- IMST-SBCI-0905 Technologies and methods for image processing, data analysis and data mining
- IMST-SBCI-0906 Computational biology and bioinformatics
- IMST-SBCI-0907 Software engineering
- IMST-SBCI-0908 Ontologies and networks

Small Business: Cell Biology and Molecular Imaging - SBCM**Descrizione SS**

The SBCM section reviews small business applications in the general areas of cell biology and molecular imaging.

- IMST-SBCM-0915 Imaging technologies for monitoring molecular interactions and/or cellular activity
- IMST-SBCM-0916 Microfluidic systems for high-throughput evaluation of cell function
- IMST-SBCM-0917 Technologies for cell culture, including cell preservation, electroporation, development of single-use perfusion, and cell sorting
- IMST-SBCM-0918 Molecular genetics including transgenic agricultural products
- IMST-SBCM-0919 Imaging technologies for monitoring molecular interactions and/or cellular activity
- IMST-SBCM-0920 Microfluidic systems for high-throughput evaluation of cell function
- IMST-SBCM-0921 Technologies for cell culture, including cell preservation, electroporation, development of single-use perfusion, and cell sorting
- IMST-SBCM-0922 Molecular genetics including transgenic agricultural products

Small Business: Devices and Detection Systems - SBDS**Descrizione SS**

The SBDS section reviews small business applications in the general area of instrumentation and systems development, including sensor and monitoring technologies for biological, environmental, and biodefense purposes.

- IMST-SBDS-0889 Detectors and signal capture systems for use in instrumentation, molecular screens, and immunoassays
- IMST-SBDS-0890 Technologies for detecting or measuring analytes in biological fluids

- IMST-SBDS-0891 Technologies for point-of-care use, first response, or field monitoring
- IMST-SBDS-0892 Technologies for molecular separations and screens, immunoassays, chemical reactions, and molecular detection
- IMST-SBDS-0893 Micro- and nano-fabrication devices and technologies
- IMST-SBDS-0894 Electrochemical devices, microfluidic, nanofluidic, and robotic systems
- IMST-SBDS-0895 Biosensors, chips, and other platforms for detecting chemicals, toxins, and pathogens in the environment or workplace
- IMST-SBDS-0896 Platforms, devices, and manufacturing practices for reducing chemicals, toxins, and pathogens in the environment or workplace
- IMST-SBDS-0897 New surface coatings, and materials, and technology for environmental and biodefense purposes

IMST - *SBGG* **Small Business: Genes, Genomes, and Genetics - SBGG**

Descrizione SS The SBGG section reviews small business applications involved in areas of genetics, genomics, and nucleic acid technology.

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- IMST-SBGG-0909 Technologies for genetic and genomic analysis, including the development of assays
 - IMST-SBGG-0910 Technologies for molecular genetics and functional genomics
 - IMST-SBGG-0911 Emerging oligonucleotide technologies
 - IMST-SBGG-0912 Technologies for gene therapy and production of transgenic species
 - IMST-SBGG-0913 Molecular genetic technologies for protein expression
 - IMST-SBGG-0914 Bioinformatics technologies for development of functional genomics studies

IMST - *SBIM* **Small Business: Drug Discovery and Development - SBIM**

Descrizione SS The SBIM section reviews small business applications in small molecule drug discovery and development

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- IMST-SBIM-0885 Medicinal, synthetic, combinatorial, pharmaceutical, natural product, peptide, and protein chemistry for therapeutic applications
 - IMST-SBIM-0886 Purification and large-scale synthesis of biological molecules, peptides, proteins, or drugs
 - IMST-SBIM-0887 Technologies for the manufacture of biological molecules or drugs
 - IMST-SBIM-0888 Computational drug design
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Descrizione IRG:

Study sections of the Molecular, Cellular, and Developmental Neuroscience [MDCN] Group review applications on the structure and function of neuronal, glial, and other excitable cells, as well as the development of both the central and the peripheral nervous systems, inclusive of the visual system and other excitable cells. Excitable cells, in addition to neural cells, include endocrine and neuroendocrine cells, pancreatic beta-cells, chromaffin cells, muscle cells, neuromuscular junctions, etc. Areas of interest include the functional characteristics of ion channels, the mechanisms by which extra- and intracellular signals are transduced and the functional characteristics of the transducers themselves, general mechanisms underlying the process of cell death, analyses of neural cell lineage, factors that specify or influence neuronal migration pathways or axonal pathfinding, processes that involve the maturation of neurons and glia, the formation of patterns and boundaries that lead to the development of adult brain regions and nuclei, and other aspects of the basic cellular and molecular physiology of neurons and glia. Applications reviewed in the MDCN Group include those relevant to disorders or injuries, but their emphasis lies more in revealing the basic biological processes that underlie or may be altered in these disorders than in treating the disorder or its manifestations.

MDCN - *BPNS***Biophysics of Neural Systems - BPNS****Descrizione SS**

The Biophysics of Neural Systems [BPNS] Section reviews applications dealing with basic biophysical studies of neurons, muscle and other excitable cells and their components in both normal and diseased states. Emphasis is on fundamental structure and function relationships relevant to physiology and disease processes, but also includes studies involving the biophysical integration of neural function, mathematical modeling and computational studies. Included are studies of subunit structure, molecular dynamics, gating and selectivity, second messengers, protein folding and misfolding, and assembly and aggregation of molecules. General approaches may include molecular and structural biology, pharmacology, biophysics, electrophysiology, protein chemistry, imaging and labeling techniques.

- MDCN-BPNS-0979 Structure and function relationships of signal transduction molecules and neuromodulators; coupling to second messenger pathways, including G-proteins, cyclic nucleotides, lipid metabolites, and Ca²⁺; modulatory pathways; voltage-gated and ligand-gated ion channels; voltage dependence, activation, inactivation, and ionic selectivity; gap junctions and connexins.
- MDCN-BPNS-0980 Structure and function relationships in neural proteins, nucleic acids, carbohydrates, and their complexes; tomographic, crystallographic, spectroscopic, and imaging studies; three dimensional structural analysis including subunit multimerization, protein folding and misfolding, assembly and aggregation; protein dynamics; protein-protein and protein-ligand interactions; membrane interfaces and microdomains; molecular modeling.
- MDCN-BPNS-0981 Biophysical integration of neural function; quantitative modeling of neural function, such as synaptic integration and spike encoding; mathematical modeling at the cellular and molecular level.

Descrizione SS

The CMBG Section reviews applications on glial-neuronal, glial-glial, and related interactions [Schwann cells, oligodendrocytes, astrocytes, and microglia]; mechanisms of glial differentiation, metabolism, and myelination; neuroinflammation and neuroimmune function across the life span.

- MDCN-CMBG-098 Basic biology of glial cells (oligodendrocytes, astrocytes, Schwann Cells, microglia), growth and differentiation of glial cells.
- MDCN-CMBG-098 Neuroglial interactions; growth factors and receptors involved in neuroglial function; role of glia in synaptic transmission; role of glia in the homeostasis of the neural environment.
- MDCN-CMBG-098 Inductive signals for the initiation, synthesis, regulation, maintenance, and degradation of myelin; mechanisms involved in demyelinating and dysmyelinating diseases and remyelination processes.
- MDCN-CMBG-098 Glial response to injury or infection; the innate immune function of glial cells; phagocytosis [microglia], role of neuroimmune molecules and the immune response in the nervous system; neuroinflammation in injury, repair processes, and/or neurodegenerative disease; secondary inflammation.
- MDCN-CMBG-098 Neuroimmune functions (and dysfunctions) across the life span; neuroimmune molecules - e.g., cytokines, chemokines, proteases and their interactions with the nervous system.
- MDCN-CMBG-098 Primary diseases of glial cells; role of glia in disorders affecting the nervous system such as the lysosomal storage diseases

Descrizione SS

The CMND Section reviews applications on cellular and molecular aspects of neurodegeneration across the lifespan; mapping novel transcripts and functional analysis of cloned gene products involved in neurodegeneration and neuroprotection; as well as molecular aspects of injury, repair and neurological disorders. Also considered are the roles of genetic factors, trophic molecules and extrinsic influences in these processes.

- MDCN-CMND-098 Characterization of abnormal protein processing associated with neurodegenerative disorders.
- MDCN-CMND-098 Structure-function studies of abnormal protein folding and/or aggregation and the clearance of aggregated proteins in the context of neurodegenerative diseases such as Alzheimer's disease, Parkinson's disease, transmissible spongiform encephalopathies (prion diseases), and Amyotrophic Lateral Sclerosis.
- MDCN-CMND-099 Delineation of physiological effects of aggregated proteins (e.g., beta amyloid, tau) on neuronal function.
- MDCN-CMND-099 Amyloidosis in the nervous system.
- MDCN-CMND-099 Characterization of molecular mechanisms underlying triple nucleotide repeat expansion neurodegenerative disorders such as Huntington's disease or spinocerebellar and Friedreich's ataxias.
- MDCN-CMND-099 Studies aimed at elucidating underlying mechanisms of neuroprotection and development of neuroprotective strategies.
- MDCN-CMND-099 Mapping novel transcripts and functional analysis of cloned gene products involve in neurodegeneration or neuroprotection, including characterization of apolipoprotein E (ApoE) and its role in neurological and neuropathological processes.

Descrizione SS

The Molecular Neuropharmacology and Signaling [MNPS] Section reviews applications on neurotransmitter and receptor-mediated signal transduction with a particular focus on neurochemical, neuroendocrine and molecular neuropharmacological mechanisms. This includes studies of ligand-receptor interactions, neuromodulator and hormonal interactions, neurotransmitter uptake and metabolism, and neurotransmitter and neuropeptide synthesis. Emphasis is on fundamental cellular and molecular mechanisms, including those relevant to the mechanisms of addiction and mental disorders, neurodegenerative disorders.

- MDCN-MNPS-099 Pharmacological and neurochemical studies of receptor activation, G-protein coupling and signal transduction cascades of G-protein coupled receptors; studies of receptor agonists and antagonists; studies of receptor modulation by interacting proteins.

- MDCN-MNPS-099 Cellular and molecular mechanisms of drugs of abuse, addiction, stress and mood disorders; cellular and molecular mechanisms underlying experimental and therapeutic approaches.
- MDCN-MNPS-099 Neuropharmacology of neurotransmitter signaling, ligand-gated ion channels, and neuromodulatory pathways; neurotransmitter and neuropeptide synthesis and regulation; genetic regulation of these events.
- MDCN-MNPS-099 Metabolic and synaptic plasticity; neurophysiology and neuropharmacology of modulatory mechanisms including electrophysiological studies; regulation of synaptic dynamics such as release, diffusion, re-uptake, inactivation.
- MDCN-MNPS-099 Modulators of synaptic function, including growth factors, neurotrophins, neuropeptides, hormones, neurotoxins and age

MDCN - *NCF* **Neurogenesis and Cell Fate - NCF**

Descrizione SS The Neurogenesis and Cell Fate [NCF] Section reviews applications concerned with the initial formation of cells in the developing nervous system, as well as neural progenitor proliferation, specification, determination, and differentiation. Also included are studies involving the initiation and regulation of cell cycle and circadian or oscillatory processes in the nervous system. Emphasis is on fundamental mechanisms underlying these processes in normal development and in responses to disease, injury, and extrinsic factors.

- MDCN-NCF-1000 Regulation of the cell cycle in neurons and glia; mechanisms of growth arrest and re-initiation of cell division and differentiation.
- MDCN-NCF-1001 Fundamental cellular and molecular mechanisms of neural induction in normal development, including transcriptional and translational regulation and signaling pathways.
- MDCN-NCF-1002 Cellular and molecular mechanisms through which the embryonic neural ectoderm acquires the characteristics of adult brain regions, including regionalization of gene transcription, cell-cell interactions, migration and signals or extrinsic factors that influence these events.
- MDCN-NCF-1003 Cellular and molecular mechanisms of neural and glial stem cell and progenitor cell induction, proliferation, migration, and phenotypic restriction; utilization of neural and glial stem cells for repair following developmental and degenerative disease and injury.
- MDCN-NCF-1004 Initiation and regulation of circadian and oscillatory processes; signals and extrinsic factors that influence circadian rhythmicity

MDCN - *NDPR* **Neurodifferentiation, Plasticity, and Regeneration - NDPR**

Descrizione SS The Neural Differentiation, Plasticity, and Regeneration [NDPR] Section reviews applications focused on differentiation, plasticity, aging, and regeneration of neuronal connectivity. Emphasis is on fundamental cellular and molecular mechanisms, including changes in gene expression and regulation, underlying normal development and aging, as well as recovery from injury, disease, and pathological insults.

- MDCN-NDPR-100 Substrates for neuronal and glial cell migration; permissive, inhibitory, and directional cues; mechanisms controlling cell motility, directional migration, and growth cone extension.
 - MDCN-NDPR-100 Axonal outgrowth, fasciculation, branching, and guidance; cell polarity; dendrites and dendritic spines; selection of synaptic partners, including formation of topographic and laminar-specific projections.
 - MDCN-NDPR-100 Synapse formation and plasticity; initial formation and maturation of pre- and postsynaptic elements; factors regulating the elaboration and retraction of arbors, processes and synapses, including neurotrophins, cytokines, cell adhesion molecules, localized translation and physiological activity; synaptic changes in response to activity, hormonal environment, and experience.
 - MDCN-NDPR-100 Regeneration of connections; factors that promote or direct axon or dendritic sprouting, axon or dendritic re-growth, re-formation of dendritic spines, and re-establishment of synaptic connections following injury; factors that inhibit these processes; development of cellular and molecular tools and strategies to overcome inhibitory factors and to promote regeneration.
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Descrizione SS

The NOMD Section reviews applications studying programmed cell death, necrosis and excitotoxicity; analysis of cloned gene products involved in cell survival or death; reactive oxygen species and oxidative stress associated with neural injury; and mitochondrial biology of neurons and glia in healthy and diseased states across the life span. Also considered are the roles of genetic factors, trophic molecules and extrinsic influences [including toxins, hormones, and addictive or environmental substances] in these processes, as well as basic aspects of disease, injury, repair and interventional strategies.

- MDCN-NOMD-100 Regulation of neuronal cell death and cell survival; functions and mechanisms of action of signaling molecules [such as neurotrophic factors, growth factors, cytokines, glutamate] and electrical activity in regulating cell survival. Intracellular signaling pathways leading to apoptosis, necrosis and excitotoxicity, and their intersection with the signal transduction pathways of survival factors.
- MDCN-NOMD-101 Oxidative stress; special metabolic and energy demands of neurons and glia; relevant aspects of mitochondrial function and localization; aspects of mitochondrial dysfunction in disease states including Alzheimer's disease, Parkinson's disease and stroke.
- MDCN-NOMD-101 Mechanisms of neuronal cell death due to aging, disease, injury and environmental or genetic factors. This could include excitotoxins, glutamate, free radicals, metals, and neurodegenerative disease genes, as well as elucidation of excitotoxic, necrotic, and apoptotic mechanisms.
- MDCN-NOMD-101 Studies of mechanisms relevant to the development of neuroprotective or cell survival strategies, such as the administration of exogenous growth factors, or antioxidants.
- MDCN-NOMD-101 Molecular mechanisms underlying neural injury associated with ischemia, reperfusion injury, traumatic brain injury, hypoxia, hypoglycemia, and excitotoxicity.

MDCN - NTRC

Neurotransmitters, Receptors, Channels and Calcium Signaling - NTRC**Descrizione SS**

The Neurotransmitters, Receptors, Channels and Calcium Signaling [NTRC] Section reviews studies of signal transduction pathways in neurons, muscles, and other excitable cells with particular emphasis on cellular and molecular regulation, physiology and functional consequences. This includes studies of calcium physiology; regulation of ionic gradients, ion pumps and molecular transporters; ion channels; ligand-gated channels; receptors; and transduction molecules. Studies may employ molecular, cellular, biochemical, electrophysiological, and imaging approaches. Emphasis is on fundamental cellular mechanisms, including those relevant to disease processes

- MDCN-NTRC-101 Intracellular regulation of calcium and calcium signaling; calcium channels, calcium storage, homeostasis, and buffering; calcium as a second messenger.
- MDCN-NTRC-101 Ion pumps, ion exchangers, and neurotransmitter transporters; electrochemical coupling; maintenance of ionic gradients; membrane properties and electrodynamics.
- MDCN-NTRC-101 Ion channels and neurotransmitter receptors; gap junctions; electrophysiological and imaging studies involving integration and propagation of electrical signals within the context of cellular physiology; interactions with second messenger systems; regulation and modulation of ion channels and receptors, including ionotropic and metabotropic receptors; mechanisms underlying synaptic plasticity such as long term potentiation, long term depression and paired pulse facilitation.
- MDCN-NTRC-101 Synthesis, genetic regulation, transcription, translation and post-translational modification of transduction molecules; genetic regulation, transcription/translation, post-translational modification; localization, assembly, trafficking, turnover, and degradation of receptors, channels, transporters, and transduction machinery.

MDCN - SYN

Synapses, Cytoskeleton and Trafficking - SYN**Descrizione SS**

The Synapses, Cytoskeleton and Trafficking [SYN] Section reviews applications on the basic cell biology of nerve, muscle and other excitable cells, including synaptic plasticity, protein and organelle trafficking, cell surface and extracellular matrix molecules in cell recognition and function, and cytoskeletal functions across the life span. Emphasis is on fundamental mechanisms of excitable cell function, including those relevant to disease processes

- MDCN-SYN-1018 Formation, regulation, maintenance, and dynamics of synaptic structure and function in the central and peripheral nervous systems.

- MDCN-SYN-1019 Molecular neuronal mechanisms of endocytosis, exocytosis and membrane recycling; protein assembly, folding and targeting; organelle, protein, and mRNA localization and trafficking.
- MDCN-SYN-1020 Transcriptional and translational regulation as they relate to synaptic function and plasticity.
- MDCN-SYN-1021 Structure, function, modification, assembly and regulation of cytoskeletal proteins and molecular motors; axonal and dendritic transport; neuronal polarity, growth cones, and structural plasticity; cytoskeletal pathology; the regulation and role of the proteasome/ubiquitin system in these processes.
- MDCN-SYN-1022 Cell surface, extracellular matrix, transmembrane components, and their function; cell recognition as it relates to synaptic assembly and function.

MDCN- *ZRDD*

Drug Discovery in the Nervous System - ZRG1 MNPS

Descrizione SS

The Drug Discovery for the Nervous System Special Emphasis Panel [ZRG1 MNPS-C (09)F] reviews pre-clinical applications with the ultimate goal of discovering new pharmacotherapeutic and immunotherapeutic agents for treating or preventing disorders of the nervous system, including drug abuse, that will eventually lead to clinical trials and approval by FDA.

- MDCN-ZRDD-102 Medicinal chemistry focusing on the discovery and refinement of molecules as a prelude to clinical use; the design and synthesis of receptor agonists or antagonists and modulators of enzyme activity, second messenger systems, ion channels or the blood brain barrier, combined with biological evaluation to determine their potential as therapeutics.
- MDCN-ZRDD-102 Development of protein-based therapies including drug specific metabolizing enzymes, drug-protein conjugate vaccines, and drug-specific antibodies.
- MDCN-ZRDD-102 Isolation, characterization and refinement of promising natural products to identify potential uses for disorders of the nervous system.
- MDCN-ZRDD-102 Development of screening assays and preclinical animal models or their use to evaluate candidate therapeutic compounds for future drug development.
- MDCN-ZRDD-102 Development of delivery systems that target compounds to the brain, including gene vectors, stem cells, protein and peptide delivery systems, and nanoparticle delivery systems.
- MDCN-ZRDD-102 Pharmacokinetic approaches in drug discovery, including the determination of blood brain barrier permeability of candidate compounds, pro drugs, pharmacokinetic modifications and new formulations including controlled release dosage forms

Descrizione IRG:

The Musculoskeletal, Oral and Skin Sciences [MOSS] Group will consider research applications that address structural systems that are prerequisite for physical form, mechanical function, movement, and integrity of the body. These structural systems and their components are the basis for the organization of the study sections of this Group and are described according to the following topical areas: skeleton, spine, bone, connective tissue, extracellular matrix, and their related diseases/disorders; dental/oral and craniofacial and their related diseases/disorders; skeletal muscle, limb, and their related diseases/disorders; joints and their related diseases/disorders, including rheumatic diseases; skin and its related diseases/disorders. Autoimmune diseases are specifically included. For these topical areas, the studies considered range from molecular genetics and stem cell research to animal models and clinical trials. For each major topical area, the research applications may include studies of: basic biology, including growth, development, maturation, and aging; biomaterials for prostheses/orthotics and implants; pathogenesis and therapeutics; physical rehabilitation; exercise; mechanobiology/biomechanics; injury and repair, including adaptation, plasticity, degeneration, and regeneration; diagnostic markers and biomarkers; cell and gene-based therapies; and clinical outcomes and trials

MOSS- ACTS**Arthritis, Connective Tissue and Skin - ACTS****Descrizione SS**

The Arthritis, Connective Tissue and Skin Sciences [ACTS] Section reviews basic and clinical research applications dealing with the biology and diseases of joints, connective tissue, and skin.

- MOSS-ACTS-1029 Arthritis and Connective Tissue: Inheritable, inflammatory and degenerative diseases of joints and connective tissues.
- MOSS-ACTS-1030 Rheumatic diseases such as systemic lupus erythematosus, rheumatoid arthritis, Sjogren's syndrome, osteoarthritis, scleroderma, psoriatic arthritis, spondyloarthropathies, vasculitides, polymyalgia rheumatica, fibromyalgia, palindromic arthritis, Lyme arthritis, septic arthritis, juvenile arthritis, polymyositis, dermatomyositis, crystal-induced diseases, and undifferentiated connective tissue diseases.
- MOSS-ACTS-1031 Biology of the joint and connective tissue: structure and function of cartilage, bone, ligaments, tendons, synovium, extracellular matrix, capsule, joint fluid, blood vessels, innervation, articular cartilage, muscle, skin, immune system and other organs affected by rheumatic diseases.
- MOSS-ACTS-1032 Skin and Cutaneous Biology: Disorders of skin and skin appendages, such as inflammatory, pre-neoplastic, and hyperproliferative disorders, as well as systemic diseases with significant cutaneous involvement.
- MOSS-ACTS-1033 Biology, physiology, development and homeostasis of the skin and skin appendages.
- MOSS-ACTS-1034 Studies of skin interactions with the environment: photoaging, UV sensitivity reactions; role of skin in transepidermal delivery of drugs; role of skin as a barrier against infectious, mechanical, and other toxic insults

Descrizione SS

The Musculoskeletal Rehabilitation Sciences [MRS] Section evaluates applications pertaining to the biological mechanisms and therapeutics of impaired physical functioning, as well as exercise and physical manipulation, as rehabilitation strategies as they relate to the musculoskeletal system.

- MOSS-MRS-1035 Rehabilitation strategies related to neural control of movement (including stroke, spinal cord injury, Parkinson's disease) and function (including carpal tunnel syndrome, repetitive stress injuries, low back pain) as well as strategies to prevent additional disabilities.
- MOSS-MRS-1036 Studies of gait and movement involving kinematics of movement and neural control of movement or function in altered states as compared to normal.
- MOSS-MRS-1037 Motor control in integrated limb function including studies of individuals with impairment or altered function compared to normal.
- MOSS-MRS-1038 Robotic interventions to restore limb function.
- MOSS-MRS-1039 Biomechanics related to skeletal muscle activation and control in rehabilitation.
- MOSS-MRS-1040 Rehabilitative therapeutic interventions of the musculoskeletal system.
- MOSS-MRS-1041 Patient-oriented studies of rehabilitative medicine.
- MOSS-MRS-1042 Mechanisms of exercise in relation to disability.
- MOSS-MRS-1043 Use of traditional and alternative therapies in the treatment of physical impairments

Descrizione SS

The Musculoskeletal Tissue Engineering [MTE] Section reviews applications concerned with the replacement or repair of damaged, missing or poorly functioning musculoskeletal tissues, including bone, skeletal muscle, cartilage, tendon, ligament and skin. Emphasis is on translational research at the interface between the combination of basic cellular processes, materials sciences and modeling and clinical treatment, with an emphasis on pre-clinical biological questions.

- MOSS-MTE-1044 Extracellular matrix, cells and mechanical and molecular signals with respect to: 1) biomaterials; natural, synthetic and biomimetic scaffolds and delivery agents for repair of musculoskeletal tissue; 2) expansion and differentiation of progenitor cells, including stem cells, for musculoskeletal tissue engineering and 3) three dimensional mechanotransduction and chemical signaling for musculoskeletal tissue engineering.
- MOSS-MTE-1045 Bioreactors and biosensors for musculoskeletal tissue engineering.
- MOSS-MTE-1046 Cell, tissue and body biomechanics and mathematical modeling with respect to musculoskeletal system tissues.
- MOSS-MTE-1047 Mechanical, electrical and biomedical engineering with respect to the repair or replacement of the musculoskeletal tissue systems

Descrizione SS

The Oral, Dental and Craniofacial Sciences [ODCS] Section reviews applications involving basic, applied and clinical aspects of the oral and salivary tissues including bioengineering of dental structures, as well as dental and enamel developmental biology, including patterning and mechanisms of biomineralization.

- MOSS-ODCS-104 Oral bacterial pathogenesis, including oral microbiological infections; role of inflammation and the immune system in oral diseases processes and prevention, etiology and agents involved in caries, periodontal diseases; other oral and hard tissue infections; biofilms of oral tissues; systemic consequences of oral microbial infections.
- MOSS-ODCS-104 Function and physiology of salivary gland and the oral mucosal environment: salivary secretions and crevicular fluids; salivary proteins, saliva chemistry and diagnostics; salivary gland pathology, including Sjogren's syndrome; radiation- and systemic disease-induced xerostomia.
- MOSS-ODCS-105 Biomimetics and bioengineering of dental tissues: biomimetic approaches for repair and replacement of dental tissues and associated structures including the salivary gland; dental restorative materials; biomechanics at micro- and macro levels; bioengineering, including cell- and gene-based therapy, drug delivery, reconstruction and repair of oral tissues; reconstruction and regeneration of the salivary gland; salivary gland as a vehicle for oral and systemic gene therapy; biosensors; structural and diagnostic imaging.

- MOSS-ODCS-105 Dentinogenesis-amelogenesis involving biochemistry, molecular/cell biology and pathology of dental structures; dentin-enamel junction/ pathology/ epithelial-mesenchymal interactions; tooth tissue engineering (dental, pulp stem cells, etc.); drug delivery, organ culture; genesis of osteoclast/ osteoblast/ cementoblasts /cementoclast/odontoblasts/ameloblast; pulp biology (vital pulp therapy, pulp regenerative responses, cytokines and signal transduction); periodontium: periodontal ligament (PDL) extracellular matrix/ cell-cell interactions; alveolar bone resorption; tooth root and crown biology; Hertwig's epithelial root sheet, enamel knot (early tooth development).
- MOSS-ODCS-105 Development and patterning of oral and dental structures: genetics and gene discovery; normal development and patterning of the dentition (including growth, maturation and size); formation of periodontal tissues and attachment complex; developmental anomalies of oral and dental/enamel structures and animal models.

MOSS- *SBDD* **Skeletal Biology Development and Disease - SBDD**

Descrizione SS The Skeletal Biology Development and Disease [SBDD] Section reviews grant applications that deal with basic and translational aspects of normal and abnormal skeletal development.

- MOSS-SBDD-1053 Basic and clinical studies of calcitropic hormones and paracrine factors involved in bone and cartilage biology; metabolic bone diseases, pathogenesis, and hormonal and paracrine functions.
- MOSS-SBDD-1054 Extracellular matrix: biomineralization of the extracellular matrix of skeletal and connective tissues and its regulation; structure and organization of matrix components; cell matrix interaction and signaling.
- MOSS-SBDD-1055 Studies involving diseases of the skeleton and mineral metabolism in humans and animal models such as osteogenesis imperfecta; Paget's disease of bone; chondrodystrophies, osteodystrophies; diseases of mineral ion homeostasis associated with abnormalities of parathyroid hormone, Vitamin D, calcitonin and other hormonal and paracrine factors.
- MOSS-SBDD-1056 Studies of molecular pathogenesis and biology of osteosarcoma, in vitro studies and animal models of the effects of primary tumors and metastasis to bone on function.

MOSS- *SBSR* **Skeletal Biology Structure and Regeneration - SBSR**

Descrizione SS The Skeletal Biology Structure and Regeneration [SBSR] Section reviews applications involving basic and applied aspects of the cellular/tissue elements of the musculoskeletal system; their interaction in joints (and the spine); their response to normal loading, injury, aging and disease/disorders; and their regeneration and repair.

- MOSS-SBSR-1057 Molecular and cell biology of bone, cartilage, tendon, and ligament injury and repair.
- MOSS-SBSR-1058 Gene expression, gene regulation, and gene therapy in the processes of injury and repair of musculoskeletal tissues.
- MOSS-SBSR-1059 Mechanobiology and biomedical mechanics at the molecular, cellular, tissue, and organ level.
- MOSS-SBSR-1060 Nature of musculoskeletal injuries, disorders/diseases of developmental, infectious, degenerative, traumatic, and/or age-related etiologies. This includes sports-related and repetitive motion disorders, and the wear, injury-induced, and degenerative changes manifest in articular and meniscal cartilage.
- MOSS-SBSR-1061 Characterization of the intrinsic capacity of musculoskeletal tissues/ joints to repair and regenerate; development and application of strategies to enhance repair (using biomolecular, biomaterial, mechanical and/or cellular approaches [tissue engineering], limb lengthening techniques, and/or targeted physical rehabilitation programs.
- MOSS-SBSR-1062 Joint mechanics (including forces and kinematics) and joint replacement (including design, materials, fixation, wear, and other modes of failure).

MOSS- *SEMO* **Musculoskeletal, Oral and Skin Sciences Small Business - SEMO**

Descrizione SS The SEMO section evaluates Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] grant applications for areas of Musculoskeletal, Oral and Skin Sciences

- MOSS-SEMO-106 Orthopedics, including: physiological, chemical, biological and bioengineering aspects of orthopedic research, bone fragility (osteoporosis) and studies of joint mechanics or joint replacement, orthopedic biomaterials, cell biology of mineralized tissues, tissue-engineering and implants, and prosthetic devices. Spinal and neuromuscular prostheses for restoration of movement are also appropriate when the emphasis is internal to the tissue/body are appropriate.
- MOSS-SEMO-106 Head and neck, oral cavity and the clinical practice of dentistry including aspects of: anatomy, biochemistry, biometry, chemistry, cell biology of oral soft tissues, computer software development, diagnostic imaging, dental materials, developmental biology, implantology, laser technology, oral, pathology, oral surgery, teratogenesis, and sterilization of dental devices.
- MOSS-SEMO-107 Connective tissue, skin, and inflammatory conditions of the joints including: products and devices used in the diagnosis and treatment of diseases, disorders or injuries; the validation of imaging methods or device development related specifically to evaluation of function or the assessment and treatment of diseases; gene or drug delivery, when the purpose is treatment of inherited or acquired disorders; wound healing and skin substitutes; photobiology and the skin; alopecia; treatment of connective tissue and skin function in diabetic complications.
- MOSS-SEMO-107 Skeletal muscle diseases, disorders and injuries, including: the development of products and devices for diagnosis and treatment; application of material science and biomedical engineering to replace or repair damaged missing or poorly functioning skeletal muscle; use of exercise or inactivity in skeletal muscle biology therapeutics.
- MOSS-SEMO-107 Physiological and bioengineering principles of rehabilitation medicine, assistive technologies and devices. These include gait analysis and human motion, monitoring of body external body movements and temperature, orthotics, prosthetic development and devices for motor function, wheelchairs and mobility aids, and exercise equipment.

MOSS - *SMEP* **Skeletal Muscle Biology and Exercise Physiology - SMEP**

Descrizione SS The Skeletal Muscle Biology and Exercise Physiology [SMEP] Section reviews applications concerned with molecular, cellular, physiological and integrative studies of normal and altered skeletal muscle function and processes that range from molecular genetics, to structure-function relationships, to integrative and functional studies on human mobility and exercise, and health. Integrative studies include development and aging, as well as gender and ethnicity differences in muscle function. Therapeutic and preventive interventions as they relate to skeletal muscle function are included, as are studies of the biochemistry and molecular biology of skeletal muscle and injuries, and diseases of muscle.

- MOSS-SMEP-106 Biochemical and molecular biological research on skeletal muscle-specific proteins
- MOSS-SMEP-106 Studies of isolated skeletal muscle cells in normal and altered states: excitation-contraction coupling, and calcium regulation; muscle biomechanics; cell-cell/cell-matrix interactions including pathways of signal transduction; physiological evaluation of skeletal muscle gene function; stem and satellite cell biology; regulation of skeletal muscle energy and substrate metabolism including mitochondrial function.
- MOSS-SMEP-106 Studies of skeletal muscle as a tissue: molecular and cellular mechanisms of skeletal muscle adaptation, growth, injury, repair, degeneration, and regeneration; effects of exercise and inactivity, maturation, nutrition, and the aging process on skeletal muscle function, protein turnover, and metabolism; normal and abnormal neural control of muscle fiber type and molecular phenotype; non-invasive imaging of skeletal muscle properties, metabolism, and mechanical dynamics; skeletal muscle biology of sarcopenia and cachexia.
- MOSS-SMEP-106 Integrative functions: effects of exercise on maintenance of functional capacity of muscle and on pathology due to inherited disease, aging, and inactivity; physiologic interactions between skeletal muscle and other organ systems in normal and disease states when skeletal muscle function is the primary focus.
- MOSS-SMEP-106 Skeletal muscle diseases: evaluation of genetics, gene function, and development of vertebrate and invertebrate genetic models; pathophysiology of skeletal muscle disorders and diseases, including the muscular dystrophies, atrophy, myotonia, periodic paralysis, malignant hyperthermia, and inflammatory myopathies; pharmacological interventions and pre-clinical approaches; cell and gene therapies for skeletal muscle diseases.

OBT **OBT - Oncology 1 - Basic Translational**

Descrizione IRG:

The Oncology 1 – Basic Translational Integrated Review Group (OBT Group) will consider applications involving basic and translational investigations that encompass cancer initiation, promotion, progression, and metastasis. Specifically, the OBT Group reviews research grant applications related to chemical and environmental induced carcinogenesis, cancer genetics, tumor biology, oncogenic transformation, regulation of tumor metastasis and angiogenesis, mechanisms of interactions between tumor and host system, and pathological approaches to oncogenesis.

OBT - *CAMP* **Cancer Molecular Pathobiology - CAMP**

Descrizione SS

The Cancer Molecular Pathobiology [CAMP] Section reviews applications involving the pathology of the malignant cell with the emphasis on mechanisms controlling cell growth and death, and the molecular events in gene regulation. Emphasis is on pathological approaches to oncogenesis and the basic cellular events involving growth of transformed cells.

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| OBT-CAMP-1073 | Oncogenes and tumor suppressor genes and signaling transduction pathways in oncogenesis |
| OBT-CAMP-1074 | Gene regulation including chromatin structure and remodeling, transcription, RNA processing and stability, and translation relevant to oncogenesis |
| OBT-CAMP-1075 | Role of characterized stem cells in oncogenesis |
| OBT-CAMP-1076 | Cell death pathways (both apoptotic and non-apoptotic) and autophagy in cancer |
| OBT-CAMP-1077 | Mechanisms involving senescence, telomeres and telomerase regulation during malignant transformation |

OBT - *CE* **Cancer Etiology - CE**

Descrizione SS

The Cancer Etiology Section reviews grant applications related to the causal agents, processes, and cells involved in early events in carcinogenesis. The areas included within CE involve gene regulation, DNA damage and repair mechanisms, chemical and viral carcinogenesis. The emphasis is on linking disciplines of chemistry and pathology on the etiology of cancer.

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| OBT-CE-1078 | Chemical- and environmental induced carcinogenesis |
| OBT-CE-1079 | Identification of causal agents such as xenobiotics and their ability to modulate gene regulation at the transcriptional level, RNA stability and processing, in early carcinogenesis events |
| OBT-CE-1080 | DNA adducts, DNA damage and repair mechanisms, metabolism of endogenous and exogenous compounds that modulate early events in carcinogenesis |
| OBT-CE-1081 | Responses to stress such as free radicals, oxidative stress and reactive oxygen species as they contribute to the carcinogenesis process |
| OBT-CE-1082 | Contribution of non HIV/AIDS viruses to carcinogenesis |

OBT - *CG* **Cancer Genetics - CG**

Descrizione SS

The Cancer Genetics [CG] Section reviews applications related to the causal agents and target genes involved in tumor pathogenesis. Organ-specific carcinogenesis is included in this Section. Studies using both mammalian and non-mammalian models are included.

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| OBT-CG-1083 | Oncogene discovery, genomics, and proteomics (including molecular and biochemical profiling), Animal models for gene discovery, positional cloning |
| OBT-CG-1084 | Cancer genetics: including hereditary and somatic DNA alterations, allelic imbalance, and Loss of heterozygosity (LOH) |
| OBT-CG-1085 | Epigenetics: including DNA methylation and imprinting |

- OBT-CG-1086 Genomic instability: including microsatellite and chromosomal instability
- OBT-CG-1087 Susceptibility/modifier genes that modify susceptibility to cancer without allelic loss including low penetrance genes identified in human and animal models

OBT - *MONC* **Molecular Oncogenesis - MONC**

Descrizione SS

The Molecular Oncogenesis [MONC] Section reviews applications that focus on the early molecular events that lead to immortalization and oncogenic transformation such as the identification of oncogenes and tumor suppressor genes, alterations in signaling, growth, and cell cycle control pathways, and protein stability/degradation mechanisms. Applications dealing with normal developmental processes as they pertain to oncogenic transformation, including the identification and characterization of progenitor and cancer stem cells are also considered.

- OBT-MONC-1088 Identification of oncogenes and tumor suppressor genes or alterations in their expression, regulation or function that may contribute to oncogenic transformation
- OBT-MONC-1089 Alterations in signal transduction pathways that may modulate or lead to oncogenic transformation
- OBT-MONC-1090 Identification and characterization of progenitor cells and cancer stem cells that may be involved in oncogenic transformation
- OBT-MONC-1091 Cell cycle regulation and dysregulation that may contribute to early oncogenic transformation
- OBT-MONC-1092 Proteasome-mediated degradation: Mechanisms and/or alterations of protein stability that could contribute to transformation, including post-translation modification such as ubiquitylation or sumoylation

OBT - *TCB* **Tumor Cell Biology - TCB**

Descrizione SS

The Tumor Cell Biology [TCB] Section reviews applications concerned with signal transduction mechanisms in neoplastic cells, regulation of tumor cell phenotype and behavior, and tumor progression. Emphasis is on signaling processes mediated by kinases, phosphatases and other molecules, including oncogenes, tumor suppressors, various growth factors and receptors, in tumor cells and animal tumor models

- OBT-TCB-1093 Signal transduction processes mediated by kinases and phosphatases and other molecules, including growth factors, nuclear factors and receptors
- OBT-TCB-1094 Pathways regulated by oncogenes and tumor suppressors that affect tumor cell phenotype and behavior, such as survival, proliferation, and death
- OBT-TCB-1095 The analysis of the composition and function of signaling complexes and their interactions among different signaling pathways in the context of tumor biology and tumor progression
- OBT-TCB-1096 Hormonal modulation of tumorigenesis, including endocrine signaling and hormone receptors mechanisms
- OBT-TCB-1097 Mechanisms that regulate differentiation and trans-differentiation in neoplasia, signal transduction mediated by cytoskeletal components and nutrient sensing mechanisms in tumor biology

OBT - *TME* **Tumor Microenvironment - TME**

Descrizione SS

The Tumor Microenvironment [TME] Section reviews grant applications that deal with basic mechanisms of interactions between tumor and host system including stroma cells, extracellular matrix (ECM) and extracellular molecules. Emphasis is on evaluation of the tumor as an organ-like structure with complex, dynamic cross-talk. Studies of tumor-stroma interactions including cell-cell interaction, tumor induced alterations of ECM during tumor progression and metastasis, tumor angiogenesis and lymphangiogenesis, and organ specific metastasis are assigned to this Section.

- OBT-TME-1098 Molecular and cellular aspects of bi-directional interaction between tumor and stromal cells (including fibroblasts, glial cells, epithelial cells, adipocytes, immune cells, inflammatory cells, vascular compartments, and bone marrow cells) during neoplastic progression, tumor angiogenesis, growth and metastasis, including studies of cancer stem cell niche and tumor cell dormancy
- OBT-TME-1099 Evaluation of tumor induced alterations in extracellular matrix during tumor progression. Cellular and molecular aspects of epithelial-mesenchymal transition (EMT) and transactivation as it relates to tumor progression

- OBT-TME-1100 Dynamics of cell-cell communication for tumor cell survival, growth and invasion focusing on cell adhesion molecules, cell junctions, as well as intercellular signaling and production of paracrine factors, chemokines, and inflammatory cytokines
- OBT-TME-1101 Development and exploration and physiologically responsive in vitro 3D matrix and organotypic models and animal models that allow investigation of tumor cells in the context of a tissue-like and in vivo environment
- OBT-TME-1102 Development and investigation of models for studying organ-specific metastases, crucial interactions between metastatic cells and site specific organs including bone/bone marrow microenvironment and other site-specific organs such as lung and brain

OBT - *TPM2* **Tumor Progression and Metastasis - TPM2**

Descrizione SS The Tumor Progression and Metastasis [TPM2] Section reviews grant applications that deal with the basic mechanisms of cancer progression, metastasis, invasion/migration and angiogenesis. Special emphasis is placed on hypoxia, inflammation, tumor imaging and pathology, adhesion, and growth. Studies focusing on cytoskeleton, proteases, wound healing, extracellular matrix remodeling, suppressors/inhibitors of metastasis & angiogenesis, and animal models of metastasis & angiogenesis will also be assigned to this Section.

- OBT-TPM2-1103 Transcriptional, posttranscriptional, translational and posttranslational regulation of tumor metastasis and angiogenesis including role of microRNA (miRNA), small inhibitory RNA (siRNA), short hairpin RNA (shRNA), small activating RNA (saRNA), ubiquitination, acetylation, and phosphorylation
- OBT-TPM2-1104 Tumor cell adhesion, invasion/migration, and angiogenesis including angiogenic factors and their receptors.
- OBT-TPM2-1105 Role of stress in tumor metastasis & angiogenesis including the function of hypoxia and inflammation
- OBT-TPM2-1106 In vitro and in vivo models of tumor metastasis and angiogenesis including genetics and imaging analysis
- OBT-TPM2-1107 Contribution of carbohydrate modifications, wound healing, and cell membrane specializations (e.g., caveolae and lipid rafts) as they relate to tumor invasion
- OBT-TPM2-1108 Role of stem cells in tumor metastasis and angiogenesis

OTC **OTC - Oncology 2 - Translational Clinical**

Descrizione IRG: The Oncology 2 – Translational Clinical Integrated Review Group (OTC Group) will consider applications involving translational and clinical investigations that encompass cancer prevention, diagnosis and treatment. Specifically, the OTC Group reviews research grant applications related to mechanism of action of cancer therapeutic agents in both in vitro and in vivo model systems; development and evaluation of experimental therapies of neoplastic diseases; translation of basic research to clinical practice; development or optimization of treatment modalities; radiation biology and therapy; chemoprevention; and development of biomarkers/signatures for tumor detection and diagnosis.

OTC - *BMCT* **Basic Mechanisms of Cancer Therapeutics - BMCT**

Descrizione SS The Basic Mechanisms of Cancer Therapeutics [BMCT] Section reviews applications addressing the mechanisms of action of anti-neoplastic agents, including drug effects on tumor cell growth, death, and differentiation. Studies analyzing the mechanisms of resistance to anti-neoplastic agents and the circumvention of resistance to cancer drugs are also included.

- OTC-BMCT-1109 Mechanism(s) of action of anti-neoplastic agents or combinations of agents at the molecular, cellular, or target tissue level

- OTC-BMCT-1110 Mechanism(s) of action of chemosensitizing agents or angiogenesis inhibitors or combinations with anti-neoplastic chemotherapeutic agents
- OTC-BMCT-1111 Mechanism(s) of resistance to anti-neoplastic agents and strategies for circumvention of resistance
- OTC-BMCT-1112 Effect of anti-neoplastic agents on tumor cell anabolic processes including: macromolecular synthesis, DNA repair, gene regulation, immortalization, differentiation, cell cycle and checkpoint control, RNA translation, and signal transduction
- OTC-BMCT-1113 Effect of anti-neoplastic agents on tumor cell catabolic processes including: DNA damage, apoptotic and non-apoptotic cell death, protein degradation, protein stability, and stress-response pathways

OTC - *CBSS* **Cancer Biomarkers - CBSS**

Descrizione SS The Cancer Biomarkers Section reviews applications addressing the discovery, development, and validation of biomarkers for diagnosing cancer, monitoring its progression, assessing patient prognosis, and assessing response to treatment through the measuring disease burden, measurement of minimal residual disease, and detection of tumor recurrence.

- OTC-CBSS-1114 The use of specific assays or global molecular profiling to identify novel biomarkers based on DNA, RNA, protein, lipids, or metabolites obtained from tumor tissue or bodily fluids
- OTC-CBSS-1115 Early detection of cancer, monitoring of its progression or response to therapy using available medical imaging approaches including MRI, PET, MRS, fluorescence, and immunohistochemical assays
- OTC-CBSS-1116 Validation of new biomarkers using animal models, human materials and clinical trials
- OTC-CBSS-1117 Clinical trials (of all phases) where the goal is biomarker validation
- OTC-CBSS-1118 Development of novel methods for biostatistical analysis, informatics, and modeling that facilitate the discovery, evaluation, and use of markers

OTC - *CDP* **Chemo/Dietary Prevention - CDP**

Descrizione SS The Chemo/Dietary Prevention (CDP) Section reviews applications that address nutrition, dietary and chemopreventive factors and their use in intervention for modulation of cancer risk, and inhibition of cancer progression. Emphasis is on basic mechanistic studies, preclinical and clinical (phase-I and phase-II) studies as well as discovery, evaluation, and validation of dietary factors.

- OTC-CDP-1119 Discovery and evaluation of diets as well as individual dietary factors, chemopreventive agents, and targets for the prevention and modulation of cancer; design, development and synthesis of preventive agents
- OTC-CDP-1120 Studies on mechanisms of nutritional prevention at the biochemical, molecular and cellular levels; effects of dietary factors on hormonal carcinogenesis, chemical carcinogenesis, differentiation/transdifferentiation, apoptosis, and cell signaling pathways; the role of diet in oxidative stress, antioxidant defense mechanisms, DNA methylation, histone acetylation, and gene expression
- OTC-CDP-1121 Development and validation of biomarkers important in prevention, including markers of cancer risk and progression
- OTC-CDP-1122 Design and development of approaches to the prevention of tumors via other factors, such as exercise, diet restriction, or vaccines
- OTC-CDP-1123 Preclinical prevention studies including in vitro and in vivo evaluation of efficacy and safety as well as in vitro and in vivo pharmacokinetic and pharmacodynamic studies of chemopreventive agents; Phase I and Phase-II clinical trials of chemopreventive agents

OTC - *CII* **Cancer Immunopathology and Immunotherapy - CII**

Descrizione SS The Cancer Immunopathology and Immunotherapy [CII] Section reviews applications addressing immunologic therapies of cancer and modulation of the innate and adaptive immune responses to cancer cells. This includes in vitro studies, the evaluation of immunotherapeutic strategies in preclinical models, and translational studies leading to pilot and/or phase I clinical trials.

- OTC-CII-1124 Tumor vaccines of all types and dendritic cell-based therapies to induce or amplify tumor immunity

- OTC-CII-1125 Therapeutic use of antibodies, conjugated antibodies, or antibody fragments to target tumor cells or to modulate immune response to cancer cells
- OTC-CII-1126 Hematopoietic stem cell transplantation and other adoptive cellular therapies with immune cells as cancer treatment
- OTC-CII-1127 Modulation of tumor immune response by gene therapy, cytokines, chemokines, growth factors, signal agonists and antagonists, or biological response modifying drugs
- OTC-CII-1128 Development and testing of methods and models of immune responses to cancer and assessing such responses in cancer patients
- OTC-CII-1129 Mechanisms of tumor resistance and escape from immune recognition or killing including modulation of tumor antigen processing and presentation, alteration of susceptibility of tumors to innate and adaptive immunologic responses, tumor-induced immune suppression and tolerance

OTC - *CONC* **Clinical Oncology - CONC**

Descrizione SS The Clinical Oncology Section reviews applications in the areas of clinical patient-oriented research and clinical therapeutic trials. This includes clinical trials with therapeutic intent using drugs, radiation, surgery, and/or biological agents.

- OTC-CONC-1130 Clinical therapy trials including surgical intervention, chemotherapy, radiation therapy and radiopharmaceuticals, combined modality therapy, immunotherapy (antibody and cellular), vaccine and gene therapy, and therapy with biological response modifiers.
- OTC-CONC-1131 Pharmacologic and toxicologic studies of new modalities in patients and correlative studies relevant to therapeutic clinical trials.
- OTC-CONC-1132 Non-behavioral alternative cancer therapies and trials.
- OTC-CONC-1133 Research on the treatment of cancer therapy-related nausea and vomiting, pain, mucositis, alopecia and fatigue.
- OTC-CONC-1134 Age-specific issues including: changes in tumor behavior with aging, clinical and laboratory assessment of the older cancer patient, age-related factors that withstand effective cancer treatment, coordination of care of the older cancer patient, pharmacology of chemotherapy agents, and amelioration of toxicity

OTC - *DMP* **Drug Discovery and Molecular Pharmacology - DMP**

Descrizione SS The Drug Discovery and Molecular Pharmacology [DMP] Section reviews applications concerned with discovery, design, identification, isolation, development and synthesis of novel agents that are potentially useful in cancer therapy. Emphasis is on identification of antineoplastic agents and validation with novel preclinical models for anticancer drug evaluation.

- OTC-DMP-1135 Novel drug discovery: identification of molecular targets of antineoplastic agents that modulate signal translation, cell cycle, differentiation, apoptosis, and hormone signaling; mechanism of action of novel agents that lead to translation of these agents in the clinic and validation of target
- OTC-DMP-1136 New drug development and production: identification, synthesis and isolation of novel drugs and modification of existing compounds for evaluation in both in vitro and in vivo tumor model systems
- OTC-DMP-1137 New technology development: development and application of new technologies for the drug discovery process, including microarray analysis, proteomics, genomics, and bioinformatics
- OTC-DMP-1138 Assay development: development of high throughput in vitro screens and cell-based assays for cancer therapeutics
- OTC-DMP-1139 Model validation: development, validation, and use of novel mammalian and non-mammalian models for anticancer therapeutic experimentation

OTC - *DT* **Developmental Therapeutics - DT**

Descrizione SS The Developmental Therapeutics [DT] Section reviews applications addressing the experimental therapy of neoplastic diseases in in vitro systems and in vivo model systems, including some early-stage, pilot clinical trials. The major emphasis of this Section is on the rational development of novel therapeutic strategies that have a significant potential for early translation to the clinic.

- OTC-DT-1140 Evaluation of drug-delivery strategies (including nanoparticles, liposomes and other delivery vehicles) and gene therapy approaches involving non-immunologic targets for the treatment of cancer.
- OTC-DT-1141 Translational studies of novel antineoplastic agents and pre-clinical drug toxicity, pharmacokinetic/pharmacodynamic and biomarker studies of anticancer agents.
- OTC-DT-1142 Development of anti-angiogenic therapeutic strategies and rational combinations of cytotoxic drugs with novel agents including those targeting: growth factors, signaling, cell cycle regulation, angiogenic, and differentiation pathways.
- OTC-DT-1143 Development and application of mathematical and computational methods for the investigation of combination chemotherapy using small molecules and other modalities.
- OTC-DT-1144 Therapeutic approaches involving biologic response modifiers, (including cytokines, and hormonal agents) either alone or in combination with novel or conventional drugs for cancer treatment.
- OTC-DT-1145 Early-stage, pilot clinical trials of novel anticancer therapeutic and drug-delivery strategies involving pharmacokinetic, pharmacodynamic, toxicologic, or pharmacogenomic endpoints

OTC - *RTB* **Radiation Therapeutics and Biology - RTB**

Descrizione SS

The Radiation Therapeutics and Biology [RTB] Section reviews applications on therapeutic interactions of ionizing radiation, radionuclides, electromagnetic radiation, and heat at the molecular, cellular, organ and patient levels. This ranges from basic studies of DNA damage responses and DNA repair to preclinical applications in which dose, dose rate, type The Radiation Therapeutics and Biology [RTB] Section reviews applications on therapeutic interactions of ionizing radiation, radionuclides, electromagnetic radiation, and heat at the molecular, cellular, organ and patient levels. This ranges from basic studies of DNA damage responses and DNA repair to preclinical applications in which dose, dose rate, type of radiation, and quality of radiation are variables.

- OTC-RTB-1146 Basic molecular/cellular-radiation/thermal interactions at therapeutic doses: radiation chemistry, DNA damage and repair, cell cycle regulation, hypoxia, signal transduction, apoptosis, heat shock proteins, growth factors, cytokines, oxidative stress, reactive oxygen species, tumor suppressor genes, cytogenetics, genomic instability, as well as radiation carcinogenesis and investigations of mechanisms of DNA damage and repair
- OTC-RTB-1147 Mechanisms and applications of modifiers of radiation response (including radiation sensitizers, radioprotectors, fractionation, hypoxia, and other modulators) and combination of radiation with novel agents (including those targeting growth factors, signaling pathways, DNA repair, and tumor angiogenesis)
- OTC-RTB-1148 Physics of treatment planning, treatment delivery, and dosimetry of brachytherapy, intravascular brachytherapy, thermal therapy, targeted radionuclide therapy, photodynamic therapy (PDT), heavy ion or neutron capture therapy, and technology and outcome analysis methodologies related to radiation treatment and planning
- OTC-RTB-1149 Therapies including: intensity modulation radiation therapy, conformal therapy, tomotherapy, hyperthermia, PDT (including interstitial PDT), photoimmunotherapy, radiofrequency ablation, cryoablation, intravascular radiotherapy, radiation-induced gene therapy, feasibility studies to establish proof-of-principle of novel radiation therapeutics or combinations of radiation with systemic agents, as well as imaging and image analysis as it relates to targeting of radiation and assessment of response
- OTC-RTB-1150 Pre-clinical studies to model radiation therapeutics, tumor biology, and radiation response modulation including: pharmacokinetics, response assessment, efficacy; and internal dosimetry of targeted radio labeled agents (including: antibodies, peptides, oligonucleotides, and liposomes)

OTC - *SETA* **Oncology 2 - Translational Clinical Small Business [SBIR/STTR] Radiation Therapy and Biology -SETA**

Descrizione SS

The Oncology 2 – Translational Clinical Small Business Activities SETA section review small business applications including Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] grant applications concerned with basic, preclinical, and clinical studies in the oncological sciences.

- OTC-SETA-1151 Radionuclides and targeted radionuclide therapy.
- OTC-SETA-1152 Radiation treatment and planning, radiation physics and dosimetry of brachytherapy.
- OTC-SETA-1153 Photodynamic therapy (PDT), heavy ion or neutron capture therapy, thermal ablation therapy.
- OTC-SETA-1154 Technology and outcome analysis methodologies related to radiation treatment and planning.

OTC-SETA-1155	Imaging and image analysis as it relates to radiation treatment and assessment of response.
OTC-SETA-1156	Development and evaluation of anti-cancer therapeutic agents and drug deliveries in both in vitro and in vivo tumor model systems
OTC-SETA-1157	Identification and validation of new cancer relevant molecular targets for therapeutic intervention
OTC-SETA-1158	Development of gene therapy with viral or non-viral based delivery in animal models
OTC-SETA-1159	Mechanisms of drug resistance and strategies to circumvent resistance
OTC-SETA-1160	Natural compounds that modulate signal transduction, cell cycle, angiogenic or apoptotic pathways
OTC-SETA-1161	Discovery and validation of biomarkers for cancer detection, diagnosis and prognosis
OTC-SETA-1162	Novel assays, instrumentation and analysis algorithm for cancer screening, and metastasis and survival prediction
OTC-SETA-1163	Basic, pre-clinical and clinical testing for tumor genetic and epigenetic variations
OTC-SETA-1164	Pre-clinical and clinical modeling of carcinogenesis, tumor development, metastasis, prevention and treatment
OTC-SETA-1165	Development and evaluation of cancer immunotherapeutic strategies in preclinical models, and translational studies leading to pilot and/or phase-1 clinical trials

PSE ***PSE - Population Sciences and Epidemiology***

Descrizione IRG:

The Population Sciences and Epidemiology [PSE] Group reviews crosscutting research relating to: the distribution of health conditions in human populations in relation to time, place, environmental exposures, personal characteristics or behaviors and the broader sociodemographic contexts in which health and health-related behaviors are embedded; the determinants of the etiologic pathways to diseases, using the full range of epidemiologic inquiry, including neuroimaging, molecular, genetic, laboratory, demographic, observational or clinical measures within the context of an epidemiologic or demographic study design; prevention trials in all settings; transmission of disease; laboratory-based research when the primary thrust is epidemiologic and laboratory data are to be collected by methods that largely already developed; and development and improvement of research designs and methodologies addressing epidemiologic and demographic questions in public health and clinical medicine. The intent is to cluster epidemiologic and demographic applications for review.

PSE - BGES **Behavioral Genetics and Epidemiology - BGES**

Descrizione SS

The Behavioral Genetics and Epidemiology [BGES] Section reviews applications on behavioral genetics and heritability studies, and behavioral epidemiologic studies. Emphasis is on the origins, multiple etiologies, natural histories, and consequences of a wide range of behaviors, psychiatric disorders, diseases, normal functioning, public health concerns, physical, mental, and substance abuse problems and the aging process as they vary across individuals, families, generation, age, sex, and populations with different predisposing or protective factors and co-morbid conditions.

PSE-BGES-1166	Behavioral genetic studies of development, mental health, psychiatric disorders, risk, resilience, and risky behaviors in the context of biological, psychological, social, environmental, and cultural factors.
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- PSE-BGES-1167 Interactive effects of risk and protective factors for physical, psychiatric and/or substance use disorders, recovery, and/or sustained health, of normal and problem behaviors within the individual, family, neighborhood, and environment, as they affect different stages of human development, clinical course, or range of outcomes.
- PSE-BGES-1168 Population-based or clinically-ascertained family, twin, and adoption studies that incorporate environmental risk factor identification and measurement.
- PSE-BGES-1169 Heritability, familial/kinship, parental, social, and environmental influences on the phenotypic expression of genotypes.
- PSE-BGES-1170 Behavioral epidemiology: descriptive, analytic, and genetic epidemiology in both general and specific population groups and international cross-cultural studies.
- PSE-BGES-1171 Interactions among individual, family, group, and community factors in the general population or defined subpopulations with special needs such as the very young, the elderly, minority groups, and those at risk for drug and alcohol abuse.
- PSE-BGES-1172 Studies of individual, familial, group, and community factors and dynamics that may predispose and/or result from natural catastrophes and traumatic events affecting a population or region - e.g., fire, hurricane, terrorism, violence, and crime

PSE - CASE Cardiovascular and Sleep Epidemiology - CASE

Descrizione SS | The Cardiovascular and Sleep Epidemiology (CASE) Section reviews applications on epidemiologic research in cardiovascular and sleep conditions.

- PSE-CASE-1173 Description of the general characteristics and the distribution of cardiovascular conditions (including myocardial ischemia and infarction, cardiac hypertrophy and failure, cardiovascular arrhythmia, vascular hemodynamics and inflammation and atherosclerosis) and sleep conditions (including insomnia, sleep apnea and narcolepsy) in human groups and populations in relation to time, place, and personal characteristics.
- PSE-CASE-1174 Elucidation of the etiological determinants of cardiovascular and sleep conditions by assembling groups of individuals to determine whether the risk of a disease/condition is different for individuals who are exposed or not exposed to specific factors (or combinations of factors) of interest. These may be either risk or protective factors.
- PSE-CASE-1175 Investigation of strategies for primary prevention of cardiovascular disease conditions and sleep conditions in human groups and populations.
- PSE-CASE-1176 Development and improvement of research designs and methodologies addressing epidemiologic questions in cardiovascular and sleep conditions

PSE - EPIC Epidemiology of Cancer - EPIC

Descrizione SS | The Epidemiology of Cancer [EPIC] Section reviews applications on epidemiologic studies in the areas of cancer

- PSE-EPIC-1177 General characteristics of the distribution of cancer (including cancer of the breast, prostate, digestive system, reproductive system, skin, lungs, and childhood cancers) in human populations in relation to time, place, and personal characteristics.
- PSE-EPIC-1178 Elucidation of the determinants of cancer and biomarkers of cancer by assembling groups of individuals to determine systematically whether the risk of disease/condition is different for individuals who are exposed or not exposed to specific factors (or combinations of factors) of interest. These may be either risk or protective factors and include genetic, epigenetic, molecular, behavioral, and environmental factors.
- PSE-EPIC-1179 Development and improvement of research designs and methodologies addressing epidemiologic questions in cancer

PSE - IRAP Infectious Diseases, Reproductive Health, Asthma and Pulmonary Conditions - IRAP

Descrizione SS | The Infectious, Reproductive, Asthma and Pulmonary Conditions (IRAP) Section reviews applications concerned with the epidemiology of infectious diseases, including vaccine-preventable diseases and emerging infections; reproductive conditions across the life span among men, women and the fetus/neonate, including birth defects and diseases of early childhood; asthma and allergy; and non-malignant pulmonary conditions. Emphasis is on the etiology of these conditions, using the methods of molecular epidemiology, clinical epidemiology, genetic epidemiology, field studies and biostatistics.

- PSE-IRAP-1180 The transmission and distribution of infectious, reproductive, asthma/allergy, and non-malignant pulmonary conditions in human populations in relation to person, place, time, environmental exposures, animal/insect vectors and personal characteristics or behaviors.
- PSE-IRAP-1181 The determinants of infectious, reproductive, asthma/allergy and non-malignant pulmonary conditions studied by assembling groups of individuals to determine systematically whether the risk of disease/condition is different for individuals who are exposed or not exposed to specific factors (or combinations of factors) of interest. These may be either risk or protective factors.
- PSE-IRAP-1182 Elucidation of the etiologic pathways to infectious, reproductive, asthma/allergy, or non-malignant pulmonary diseases/conditions using the full range of epidemiologic inquiry, including molecular epidemiology, genetic epidemiology, genome-wide association studies, laboratory indices, clinical measures and prevention/intervention trials.

PSE - *KNOD* **Kidney, Nutrition, Obesity and Diabetes - KNOD**

Descrizione SS The Kidney, Nutrition, Obesity and Diabetes [KNOD] Section reviews applications concerned with descriptive and analytic epidemiology as well as genetics of kidney disease, obesity, diabetes, gastro-intestinal conditions, environmental and nutritional influences on health outcomes.

- PSE-KNOD-1183 The distribution of kidney diseases/conditions, obesity, diabetes, gastro-intestinal conditions, environmental and nutritional influences on health in human populations in relation to time, place, and personal characteristics.
- PSE-KNOD-1184 Elucidation of the determinants of kidney diseases/conditions, obesity, diabetes, gastro-intestinal conditions, environmental and nutritional influences on health outcomes in human populations in relation to time, place, and personal characteristics. The focus is to determine systematically whether the risk of disease/condition is different for individuals who are exposed or not exposed to specific factors (or combinations of factors) of interest. These may be either risk or protective factors.
- PSE-KNOD-1185 Elucidation of the genetic determinants of kidney diseases/conditions, obesity, diabetes, gastro-intestinal conditions, environmental and nutritional influences on health outcomes through studies of populations and their genetic architecture. The focus is to locate, identify, and measure the impact of genetic loci contributing to these complex biomedical entities and understand the interaction between genetic loci, environmental influences, and lifestyles within populations.
- PSE-KNOD-1186 Development and improvement of research designs and methodologies addressing epidemiologic questions in kidney diseases/conditions, obesity, diabetes, gastro-intestinal conditions, environmental and nutritional influences on health outcomes in human populations in relation to time, place, and personal characteristics.

PSE - *NAME* **Neurological, Aging and Musculoskeletal Epidemiology - NAME**

Descrizione SS The Neurological, Aging and Musculoskeletal Epidemiology [NAME] Section reviews applications on epidemiologic research in neurological disorders (including Alzheimer's disease, dementias, stroke, Parkinson's disease, epilepsy, and neurodevelopment), conditions related to human aging (including falls and fractures, functional status, frailty, quality of life, health care use, healthy aging and longevity), and musculoskeletal conditions (including arthritis, osteoarthritis, inflammatory arthritis, osteoporosis, and bone development in children, and musculoskeletal injury).

- PSE-NAME-1187 The general characteristics of the distribution of neurological disorders, conditions related to human aging, and musculoskeletal conditions in human populations in relation to time, place, and personal characteristics.
- PSE-NAME-1188 Elucidation of the determinants and biomarkers of neurological disorders, conditions related to human aging, and musculoskeletal conditions by assembling groups of individuals to determine systematically whether the risk of disease/condition is different for individuals who are exposed or not exposed to specific factors (or combinations of factors) of interest. These may be either risk or protective factors and include genetic, epigenetic, molecular, behavioral, and environmental factors.
- PSE-NAME-1189 Development and improvement of research designs and methodologies addressing epidemiologic questions in neurological disorders, conditions related to human aging, and musculoskeletal conditions

Descrizione SS

The Social Sciences and Population Studies [SSPS] Section reviews applications related to population processes, composition and distribution, their antecedents and consequences, and their inter-relationships with social, cultural, economic, behavioral, developmental and biomedical factors and processes. This includes studies of migration, mortality and health, residential distribution, reproduction, sexual health, population aging, labor force and retirement, household and family structure, intergenerational relations, and biodemography in the U.S. and other countries.

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- PSE-SSPS-1190 Fertility, including studies of conception, pregnancy, birth, and pregnancy outcomes; contraceptive use and sexual behavior; infertility; birth spacing and timing; birth intentions; value of children; interrelationships with the status and roles of women and men, health, union formation and dissolution, and other related social, cultural, economic, behavioral, and biological processes.
- PSE-SSPS-1191 Mortality, health, functioning and disability; differentials, trends and projections for individuals, groups and populations; studies of perinatal, infants, child, adult and elderly health and mortality; interrelationships with demographic, social, economic, behavioral, and biobehavioral processes; health economics.
- PSE-SSPS-1192 Migration, emigration and immigration, including movement of people within and across national boundaries; social, cultural, economic, behavioral, and health factors and processes associated with population movement; processes related to migration [e.g., acculturation, adaptation].
- PSE-SSPS-1193 Population composition and changes in composition, such as population aging, and the interrelationships between demographic, economic and social processes; household and family structure, economic status and inequality, health status, intergenerational exchanges and bequests, and impacts on public programs; employment, labor force and retirement; studies of interrelationships between health, migration, fertility and family and household structure; impacts of public and private programs on health, family structure, labor force transitions and income security of the elderly.
- PSE-SSPS-1194 Population and the environment; interrelationships between population processes and the physical environment
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Descrizione SS

The Social Sciences and Population Studies ZRSS section reviews (no other area) applications that would otherwise be reviewed by Social Sciences and Population Studies (SSPS) Section. Accordingly, it reviews applications related to population processes, composition and distribution, their antecedents and consequences, and their inter-relationships with social, cultural, economic, behavioral, developmental and biomedical factors and processes. This includes studies of migration, mortality and health, residential distribution, reproduction, sexual health, population aging, labor force and retirement, household and family structure, intergenerational relations, and biodemography.

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- PSE-ZRSS-1195 Fertility, including studies of conception, pregnancy, birth, and pregnancy outcomes; contraceptive use and sexual behavior; infertility; birth spacing and timing; birth intentions; value of children; interrelationships with the status and roles of women and men, health, union formation and dissolution, and other related social, cultural, economic, behavioral, and biological processes.
- PSE-ZRSS-1196 Mortality, health, functioning and disability; differentials, trends and projections for individuals, groups and populations; studies of perinatal, infants, child, adult and elderly health and mortality; interrelationships with demographic, social, economic, behavioral, and biobehavioral processes; health economics.
- PSE-ZRSS-1197 Migration, emigration and immigration, including movement of people within and across national boundaries; social, cultural, economic, behavioral, and health factors and processes associated with population movement; processes related to migration [e.g., acculturation, adaptation].
- PSE-ZRSS-1198 Population composition and changes in composition, such as population aging, and the interrelationships between demographic, economic and social processes; household and family structure, economic status and inequality, health status, intergenerational exchanges and bequests, and impacts on public programs; employment, labor force and retirement; studies of interrelationships between health, migration, fertility and family and household structure; impacts of public and private programs on health, family structure, labor force transitions and income security of the elderly.
- PSE-ZRSS-1199 Population and the environment; interrelationships between population processes and the social and physical environment.
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Descrizione IRG:

The Risk, Prevention and Health Behavior [RPHB] Group considers applications covering a wide range of biological, psychological, cultural and social conditions and traits that affect the manifestation, prevention, treatment or management of physical and mental diseases and disorders. Emphasis may be placed on individual behavior, interpersonal relations, or group contexts. Populations studied may include clinic, community-diagnosed, symptomatic and high-risk groups, and research may be concentrated on specific age groups or address questions of change or transition across the life course. Interventions may be purely behavioral, or may involve non-behavioral elements such as pharmacological treatments and devices. Specific areas of interest include (but are not limited to): cognitive and affective processes and markers of disease and illness, gene-environment interactions as they affect individual behavior; behavioral and pharmacologic interventions; risk and protective processes and models, intra- and interpersonal interventions; social development and interpersonal processes, aggressive behavior and violence, and prevention and intervention methodology; intervention and risk factor modification studies, interactions between social and psychological processes and disease management; psychological and biobehavioral responses to disease screening and management; rehabilitation of conditions associated with psychological, physical, communicative, and social disability; and social, cognitive, and affective conditions and processes that influence disease and disorder across the lifespan.

RPHB- *BMIO***Behavioral Medicine: Interventions and Outcomes - BMIO****Descrizione SS**

The Behavioral Medicine: Interventions and Outcomes Section reviews behavioral and biobehavioral approaches to treatment, management, adaptation, and rehabilitation related to physical or cognitive impairment; study of sequelae of diseases or disorders; and biobehavioral aspects of pain, affect, stress, social support and symptom perception. Included are applications focused on interactions between experiential, behavioral, social, psychological, and physiological factors

- RPHB-BMIO-1200 Cognitive, psychological, social and cultural factors affecting the experience and interpretation of pain or physical symptoms and their relationship to diagnosis or treatment of somatic diseases or conditions.
- RPHB-BMIO-1201 Psychological, behavioral or biological responses to interventions designed to reduce stress, distress or pain secondary to disease, conditions or surgical procedures.
- RPHB-BMIO-1202 Behavioral interventions as primary or adjunctive treatments; studies of behavioral interventions designed to remedy or slow the progression of diseases or disorders.
- RPHB-BMIO-1203 Rehabilitation of conditions associated with disability including cognitive, physical, communicative and social role functioning.
- RPHB-BMIO-1204 Outcome studies focused on changes in quality of life and psychosocial adjustment.
- RPHB-BMIO-1205 Interactions between symptoms and health behavior change and management. Studies focusing on adherence, compliance, decision-making, patient education, self-care or self-management, and genetic counseling.

Psychosocial and Developmental Processes, Personality, and Behavior Fellowship - F11

Descrizione SS

The F11 Section reviews fellowship applications in the areas of social, developmental, and personality psychology, medical sociology and anthropology, and in the areas of behavioral medicine and addictions science. Study populations may include children, adolescents, and adults at any stage of the life course. Emphasis may be placed on individual differences, interpersonal processes, life course transitions, or contextual effects as they influence the prevention, etiology, or treatment of mental and physical disorders. Also included is research aimed to identify psychosocial and biological antecedents and risk pathways for the onset, development and progression of addictive behaviors across the lifespan

- RPHB-F11-1237 Aggressive behavior and violence
- RPHB-F11-1238 Attitudes and behavior
- RPHB-F11-1239 Emotion regulation
- RPHB-F11-1240 Individual differences in personality
- RPHB-F11-1241 Marital and family interventions
- RPHB-F11-1242 Psychological stress and coping behavior
- RPHB-F11-1243 Self and social identity
- RPHB-F11-1244 Social support and illness management
- RPHB-F11-1245 Behavioral and psychosocial correlates and consequences of physical activity and eating disorders
- RPHB-F11-1246 Etiology, prevention, and treatment of drug abuse
- RPHB-F11-1247 Development of substance use disorders in children of substance abusers

RPHB- PDRP

Psychosocial Development, Risk, and Prevention - PDRP

Descrizione SS

The Psychosocial Development, Risk, and Prevention [PDRP] Section reviews applications that focus on the development of psychopathology and problem behaviors, the identification of risk and protective factors and processes, and the design and testing of intra- and –inter personal interventions related to social development across the life span. Applications on risk and protective factors and preventive interventions may be focused on outcomes and comorbid conditions related to the broader understanding of developmental psychopathology as well as optimal development

- RPHB-PDRP-1206 Risk and protective factors and preventive interventions related to developmental psychopathology and problem behaviors, including violence, child abuse and maltreatment, aggression, suicidal behavior, substance use and other negative influences.
- RPHB-PDRP-1207 Individual interventions related to social development, including social skills and coping, emotion regulation strategies, social competence training, and school readiness.
- RPHB-PDRP-1208 Interpersonal interventions related to social development, including family relations, parenting skills, parent-child interaction, peer relationships, school-based interventions and social normal development.
- RPHB-PDRP-1209 Preventive interventions, including quantitative and qualitative approaches with particular emphasis on longitudinal and multilevel strategies

RPHB- PRDP

Psychosocial Risk and Disease Prevention - PRDP

Descrizione SS

The Psychosocial Risk and Disease Prevention (PRDP) Section reviews applications to develop and/or test behavioral interventions to prevent or reduce risk for morbid physical conditions or disease states, particularly chronic conditions in which behavior plays a major role in etiology and progression. Research may include psychosocial, pharmacological, or biological variables but the predominant intervention component should be behavioral. Research participants may be comorbid for psychological conditions (e.g., depression)

- RPHB-PRDP-1210 Obesity development and prevention, including efforts to reduce risk of further obesity development or to maintain weight loss.

- RPHB-PRDP-1211 Chronic disease risk reduction through changes in dietary intake and physical activity - Prevention of metabolic syndrome and diabetes developmen
- RPHB-PRDP-1213 Cancer risk prevention or reduction, including efforts to develop screening protocols, improve adherence to screening recommendations, and enhance quality of life in cancer survivors.
- RPHB-PRDP-1214 Cardiovascular disease risk prevention or reduction, including efforts to reduce risk of subsequent cardiac events.
- RPHB-PRDP-1215 Sleep disorder development and prevention

RPHB- *RPIA*

Risk, Prevention and Intervention for Addictions - RPIA

Descrizione SS

The Risk, Prevention and Intervention for Addictions Section reviews applications for qualitative and quantitative research in humans on psychosocial and biological antecedents and risk pathways for the onset, development and progression of addictive behaviors across the lifespan as well as research leading to the development and testing of interventions to prevent the onset of addictive and related problem behaviors, or to prevent the progression of use to abuse. RPIA also reviews research to develop, modify, adapt, pilot, or test therapeutic interventions (and related clinical training procedures) aimed at curtailing the progression of drug abuse to addiction, preventing relapse, and treating substance abuse and dependence. Domains of risk include biological, genetic, psychological, behavioral, cognitive, interpersonal, and environmental factors. RPIA reviews prevention and treatment interventions tested under controlled (efficacy) and real world (effectiveness) situations

- RPHB-RPIA-1216 Etiology of substance abuse and other potentially addictive behaviors, including gambling.
- RPHB-RPIA-1217 Prevention of substance use and progression toward addiction, across the life span (e.g., early onset; emerging adulthood).
- RPHB-RPIA-1218 Prevention trials examining the effectiveness of efficacious interventions delivered in less controlled or uncontrolled situations or service settings.
- RPHB-RPIA-1219 Stage I, II, and III projects to develop, pilot, and test treatments for substance use disorders including those that examine behavioral and/or biological mechanisms of behavior change.
- RPHB-RPIA-1220 Underage drinking, alcohol abuse and related problems.
- RPHB-RPIA-1221 Tobacco use, nicotine dependence, and prevention and cessation interventions.
- RPHB-RPIA-1222 Craving, cue reactivity, and related interventions.
- RPHB-RPIA-1223 Co-morbidity of addictions and other behavioral, biosocial, and psychological conditions.
- RPHB-RPIA-1224 Acute and long-term effects of substance abuse.
- RPHB-RPIA-1225 Substance-related violence and victimization.
- RPHB-RPIA-1226 New and emerging drug use and other addiction problems.
- RPHB-RPIA-1227 Development of methods specific to these areas of research

RPHB- *SPIP*

Social Psychology, Personality and Interpersonal Processes - SPIP

Descrizione SS

The Social Psychology, Personality and Interpersonal Processes Section reviews applications for research on fundamental psychological and social conditions and processes, including personality, emotions, motivation, social identities and roles, social cognition, attitudes and attitude change, individual differences, aging and the life course, and small group dynamics and their relation to mental and physical health

- RPHB-SPIP-1228 Personality traits, their development and change; social, cultural and genetic influences on personality.
- RPHB-SPIP-1229 Motivation and emotions; prosocial and antisocial motivation.
- RPHB-SPIP-1230 Self-esteem, self-evaluation, self-efficacy, self-control, and identity development.
- RPHB-SPIP-1231 Social cognition; formation, maintenance, and change of attitudes and culturally based beliefs; relation of attitudes and behavior.
- RPHB-SPIP-1232 Social norms, roles and support; their influence on mental and physical health.
- RPHB-SPIP-1233 Social stress and coping; risk and resilience; consequences for health and well-being.
- RPHB-SPIP-1234 Aging, life course, and health; elder care.

- RPHB-SPIP-1235 Small group dynamics and decision-making; intergroup conflict and negotiation.
- RPHB-SPIP-1236 Relation of these attributes and processes to mental/physical health and illness, morbidity, mortality and social well-being.

RPHB- *TPM1*

SBIR/STTR: Risk Prevention and Health Behavior across the Lifespan - TPM1

Descrizione SS

SBIR/STTR applications reviewed by the TPM1 section cover a wide range of social, behavioral, and technological interventions designed to reduce the risk of illness and disease, improve their treatment and management, and mitigate harmful consequences of symptoms and treatments

- RPHB-TPM1-1248 Prevention directed at individual behavior change: smoking, drug/alcohol abuse, child and spousal violence, physical injury.
- RPHB-TPM1-1249 Patient/physical education regarding increasing physical activity, improving nutrition, weight management.
- RPHB-TPM1-1250 Complementary and alternative medicine approaches to reducing risk factors for cardiovascular disease, women's health - menopause, breast cancer, ovarian cancer.
- RPHB-TPM1-1251 Caregiving issues for patients with dementia, stroke victims, the elderly and physically disabled; mobility trackers for patients in nursing homes or assisted living situations.
- RPHB-TPM1-1252 Management of chronic illnesses, including treatment decision-making and psychosocial influences on and consequences of illnesses such as pain, asthma, cancer, diabetes, cardiovascular disease, and arthritis; medication adherence and compliance.
- RPHB-TPM1-1253 Childhood and teen behavior change and parent education in general and special populations (e.g., adoptive and foster parent).

SBIB

SBIB - Surgical Sciences, Biomedical Imaging, and

Descrizione IRG:

The Surgical Sciences, Biomedical Imaging, and Bioengineering [SBIB] Group will review applications for research grants that address topics in a variety of areas at the interface between a physical science or engineering and biomedical or clinical research. Major areas include: (1) Development of molecular probes and contrast agents; development of molecular imaging techniques; and basic, applied, and pre-clinical aspects of the design and development of medical imaging systems (including hardware, software and mathematical methods of image analysis) for studying organs or whole animals (including humans). (2) Application of computational sciences to knowledge and information in bio and clinical medicine, healthcare and their integration. (3) Development of: biomedical sensing and measurement instrumentation; diagnostic instrumentation creating knowledge to enhance organ system function and recovery; innovative biologics, materials, processes, implants, devices; and informatics approaches to prevent, diagnose, and treat disease. (4) Surgery and anesthesiology; host response to sepsis and injury; surgical and microsurgical therapies; surgical critical care and emergency medicine; treatment of trauma; multi-organ responses to surgery.

Descrizione SS

The Biomedical Imaging Technology [BMIT] Scientific Review Group reviews grant applications involving basic, applied, and pre-clinical aspects of the design and development of medical imaging system technologies, their components, software, and mathematical methods for studies at the cellular, organ, small or large animal, and human scale. Emphasis is on the technology development but extends to the science of image formation, analysis, evaluation and validation, including image perception, and integration of imaging technologies.

- SBIB-BMIT-1254 Component technologies used in the design, development, implementation, testing and application of imaging systems, such as: image detectors and related energy conversion devices, ionizing and non-ionizing radiation detectors, magnets and coils, and other technologies used in devices to acquire medical image data from various modalities.
- SBIB-BMIT-1255 Physics and mathematics of medical imaging devices and systems for hardware and software development: application of methods of applied mathematics for solving inverse problems using iterative, non-iterative, deterministic and probabilistic approaches; and analysis of complex dynamical systems.
- SBIB-BMIT-1256 Methods of processing and presenting medical images: display, computational resources for reconstruction, registration, segmentation, visualization, and analysis of 2-, 3-, and 4- (or higher) dimensional data sets from various modalities.
- SBIB-BMIT-1257 Development of image-based methods and strategies to characterize tissue or for the support of image-guided surgical or physical interventions that require high performance computing and display of images for interactive man-machine environments that simultaneously, or sequentially, diagnose, plan, treat, update, and follow-up.
- SBIB-BMIT-1258 Methodology for validating medical imaging systems including medical-image-observer performance: vision modeling, metrics, calibration, standards, statistical methods, and simulation of an ideal observer using principles of psychophysical experimentation

Descrizione SS

The Bioengineering, Technology, and Surgical Sciences (BTSS) Section reviews grant applications in the interdisciplinary fields of surgery and bioengineering to develop innovative medical instruments, materials, processes, implants, and devices to diagnosis and treat disease and injury. Within BTSS there is a balance between basic, translational, and clinical research and application and development of emerging cross-cutting technologies relevant to the cardiac system.

- SBIB-BTSS-1259 Development of advanced tools and techniques, including the design, construction, and function of cellular and tissue-engineered constructs, vascular and vein grafts.
- SBIB-BTSS-1260 Design, development and evaluation of medical devices using animal models and pre-clinical human studies, including endo-surgical procedures, catheter-based surgery, minimally invasive surgery, microsurgical procedures, and robotics.
- SBIB-BTSS-1261 Development of therapeutic implantable devices, including delivery systems for drug delivery as well as the delivery of nano-molecules and bio-molecules..
- SBIB-BTSS-1262 Fluid mechanics studies of circulation, microcirculation, and transport systems. Biomechanics, computational fluid dynamics, hemodynamics, mathematical modeling, simulation, ventricular remodeling, tissue and organ mechanics and the mechanics of injury.
- SBIB-BTSS-1263 Sensors, biosensors, sensing, laser, acoustics, mems, microarrays, imaging, and nanotechnology.

Descrizione SS

The CMIP Section reviews the development, synthesis, selection, optimization, and validation of novel diagnostic, therapeutic pharmaceuticals or molecular signatures intended for use in translational and clinical imaging studies. The emphasis is on targeting, metabolism, effectiveness, toxicology, biodistribution, breakdown products and pathological findings for imaging cells, tissues, organs, or whole body in animals and humans. These studies often involve radiochemistry, pharmacokinetics, and pharmacodynamics

- SBIB-CMIP-1264 The development of targeted MRI probes, using paramagnetic, nanoparticle, hyperpolarized or other contrast mechanisms, and the development of instrumentation that is uniquely required for probe-based imaging.

- SBIB-CMIP-1265 The development of targeted molecular imaging agents detectable with X-ray based modalities.
- SBIB-CMIP-1266 Development of targeted optical imaging agents, including fluorescence, bioluminescence, photosensitizer, and agents for photoacoustic imaging.
- SBIB-CMIP-1267 Development of diagnostic and therapeutic agents and carriers including radiopharmaceutical agents.
- SBIB-CMIP-1268 Novel reporter gene strategies for imaging of gene expression and inter-molecular interactions in vivo.
- SBIB-CMIP-1269 Live cell imaging including cell trafficking, improved labeling methods, mechanistic studies, physiologic processes, and distribution.
- SBIB-CMIP-1270 Translational and clinical toxicity, as well as biodistribution of agents and their breakdown products, which may involve radiochemistry, pharmacokinetic and pharmacodynamic studies of imaging agents

SBIB - *F15*

Bioengineering and Imaging Fellowship - F15

Descrizione SS

The F15 Section reviews fellowship applications in clinically-oriented areas of imaging, surgery, bioengineering and computer/informatics. Basic, applied and pre-clinical aspects of the design and development of medical imaging systems, their components, software, and mathematical models, for studies at the organ, small or large animal, and human scale are included. Proposals involving the application and validation of in vivo animals in animals or humans, including early phase clinical studies of medical imaging systems, molecular probes and contrast agents, software, molecular imaging techniques and related technologies are also reviewed here. Surgical proposals involving trauma, anesthesiology, wound healing, sepsis and pain management are reviewed in SBIB, as well as proposals focused on the technology surrounding the surgical sciences. The focus of the computer/informatics area is on methods, techniques and software development primarily related to clinical problems.

- SBIB-F15-1326 Development and evaluation of surgical systems, therapeutic devices and systems
- SBIB-F15-1327 Design, development, implementation and testing of imaging systems, including pre-clinical, Phase I, and Phase II clinical trials
- SBIB-F15-1328 Development of tissue engineered constructs
- SBIB-F15-1329 Multi-model treatment of critical injury
- SBIB-F15-1330 Organ preservation
- SBIB-F15-1331 Pathogenesis and amelioration of shock
- SBIB-F15-1332 Application of intelligent systems to clinical problems
- SBIB-F15-1333 Application of data analysis, management and mining to medical records, picture archiving, teleimaging, etc.
- SBIB-F15-1334 Development of telemedicine systems
- SBIB-F15-1335 Processing of medical images
- SBIB-F15-1336 Characterization of tissues by imaged based methods
- SBIB-F15-1337 Image guided surgical interventions
- SBIB-F15-1338 Medical image observer performance
- SBIB-F15-1339 Prediction, selection and monitoring therapeutic response by administering agents and imaging; synthesis of new diagnostic agents
- SBIB-F15-1340 In vivo strategies for characterizing tissues
- SBIB-F15-1341 Development of surrogate endpoints based on quantitative imaging

SBIB - *MEDI*

Medical Imaging - MEDI

Descrizione SS

The Medical Imaging [MEDI] Scientific Review Group reviews proposals involving the application and validation of in vivo imaging of humans and animals, including early phase clinical studies of medical imaging systems, molecular probes and contrast agents, software, molecular imaging techniques, and related technologies. The underlying technologies may be refined and optimized during testing in response to research questions or clinical needs.

- SBIB-MEDI-1271 Evaluation of improvements in technologies underlying medical imaging systems, as well as studies of available medical imaging systems to evaluate novel medical applications.
- SBIB-MEDI-1272 Pre-clinical, Phase-I, and -II clinical trials of medical imaging systems and accessories, including MRI, MRS, optical, PET, PET/CT, fMRI, photoacoustic, DTI, nuclear medicine, ultrasound, multimodality, etc. and their associated contrast agents.
- SBIB-MEDI-1273 Prediction, selection, and monitoring of therapeutic response based on imaging studies, with or without exogenous agents, using one or more modalities, especially for multi-temporal investigations to measure changes relative to a pretreatment baseline.
- SBIB-MEDI-1274 Applications of imaging systems and modification of diagnostic methods for use in: screening; characterizing physiological effects, and assessing risk.
- SBIB-MEDI-1275 Image-guided interventions in integrated diagnostic and therapeutic systems.
- SBIB-MEDI-1276 In vivo strategies and methods for characterizing tissue, and distinguishing between normal and pathologic states, based on estimates of biophysical, biomechanical, bioelectrical, biochemical, metabolic, perfusion/diffusion, or other properties.
- SBIB-MEDI-1277 Development of surrogate endpoints based on quantitative imaging for use in clinical trials of medical devices, pharmaceuticals, biologics and other therapeutic interventions.
- SBIB-MEDI-1278 Prediction, selection and monitoring therapeutic response by administering agents and imaging, to detect the location, amount, and fate of the agent in normal and diseased tissues.
- SBIB-MEDI-1279 Diagnosis of functional disorders and classification of tissue as normal or pathologic based on exogenous agents that may be tailored to specific cellular processes or genetic expressions

SBIB - SAT

Surgery, Anesthesiology, and Trauma - SAT

Descrizione SS

The Surgery, Anesthesiology, and Trauma (SAT) Section reviews applications in the disciplines of surgery, anesthesiology, and critical care. Sepsis and injury studies reviewed by SAT often address the host response to these complex insults such as trauma, disseminated infection, or surgical stress, with a general focus on systemic metabolic, hormonal, or immune responses to infection and multi-organ damage

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- SBIB-SAT-1280 Tissue, organ and systemic injury responses to surgery, trauma, burn, sepsis, hemorrhage, ischemia-reperfusion, or resuscitation, including integrating pathways and signals.
- SBIB-SAT-1281 Genetic and epigenetic determinants of response to injury or sepsis; and genetic, epigenetic, or pharmacologic approaches for treatment.
- SBIB-SAT-1282 Pathogenesis and therapeutic interventions for shock and multiple organ failure, and for hypoxic or oxidative cell/tissue injury and stress-induced cellular turnover and repair.
- SBIB-SAT-1283 Multi-modal treatment of critical injury including metabolic, hormonal, or nutritional interventions, and infection prophylaxis or therapies.
- SBIB-SAT-1284 Modeling of shock, critical illness, and injury with multi-modal diagnostic and/or therapeutic approaches.
- SBIB-SAT-1285 Skin and integument wound healing, including tissue/organ regeneration, remodeling of damaged tissues, stem cells/progenitors, and novel therapeutic interventions.
- SBIB-SAT-1286 Pharmacology of general and local anesthetics, including mechanisms and side effects.
- SBIB-SAT-1287 Mechanisms and management of pain in the context of surgery, injury, and anesthesiology.
- SBIB-SAT-1288 Approaches to utilize adult stem cells for maintenance or restoration of tissue function.
- SBIB-SAT-1289 Mechanisms of the host response to the tissue damage associated with organ, tissue, or cellular transplantation.
- SBIB-SAT-1290 Surgical approaches to organ/tissue-specific disease, injury, or repair including minimally invasive and transluminal surgical approaches

Descrizione SS

The Small Business Biomedical Sensing, Measurement and Instrumentation Scientific SBBS section reviews grant applications for the small businesses initiative programs (Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR]) involving biomedical sensing, measurement, and the development of diagnostic and therapeutic instrumentation. Research that focuses on the development of innovative sensors may range from fundamental physical, mechanical or chemical transduction through basic measurement principles to the design of novel instruments for clinical use

- SBIB-SBBS-1316 Sensor technology: use of sensor technology (including micro- and nanotechnology and micro-electromechanical systems) in the development of medical and medical research instrumentation.
- SBIB-SBBS-1317 Measurement devices and systems: Instruments for the physiological monitoring of patients or experimental animals.
- SBIB-SBBS-1318 Instruments for the diagnosis or treatment of disease.
- SBIB-SBBS-1319 Techniques and technology for processing and controlling physiological signals.
- SBIB-SBBS-1320 Techniques and technology for remote medical diagnosis and computer-assisted diagnosis and therapy

Descrizione SS

The Small Business Biomedical Imaging [SBMI] Scientific Review Group reviews Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR] grant applications involving basic, applied and pre-clinical aspects of the design and development of medical imaging systems, their components, software and mathematical methods, and related technologies. Also reviewed are proposals involving the application and validation of in vivo human and animal imaging, including early phase clinical aspects of medical imaging systems, agents, software and mathematical methods, or related technologies. During testing, the underlying technologies may be refined or optimized in response to research questions and clinical needs

- SBIB-SBMI-1291 Prediction, selection, and monitoring of therapeutic response by administration of agents accompanied by imaging to detect the location, amount, and fate of normal and pathologic structures. This implies multi-temporal image-based evaluation of tracers and metabolites in a detailed anatomic framework that could require multiple modalities and post-processing of data sets.
- SBIB-SBMI-1292 Diagnosis of functional disorders and classification of tissue as normal or pathologic based on exogenous agents that may be tailored to specific cellular processes or genetic expressions.
- SBIB-SBMI-1293 Studies of component technologies used in the design, development, implementation, testing, and application of imaging systems (such as: image detectors and related energy conversion devices, ionizing and non-ionizing detectors, magnets and coils).
- SBIB-SBMI-1294 Physical and mathematical approaches to the development of medical imaging devices and systems (hardware and software): for example, the analysis of complex dynamical systems and the application of methods of applied mathematics to solving inverse problems using iterative, non-iterative, deterministic, and probabilistic approaches.
- SBIB-SBMI-1295 Medical image processing methods: display, and computational resources for reconstruction, registration, segmentation, visualization, and analysis of 2-, 3- and 4- or higher dimensional data sets.
- SBIB-SBMI-1296 Analysis of medical images in conjunction with other sources of non-image data including: multi-media data, data transmitted and archived in databases for data mining, artificial intelligence, computer vision, and computer-aided diagnosis.
- SBIB-SBMI-1297 Presentation for human observers, images derived from voluminous multi-dimensional data sets by visualization, including: man-machine interfaces; real-time interactive systems; multi-modality fusion; multi-temporal data sets; and workstation software and hardware design, implementation, and psychophysical testing.
- SBIB-SBMI-1298 Development of image-based methods for characterizing tissues using estimates of their local and global biophysical, biomechanical, bioelectrical, biochemical, metabolic, and biological properties.
- SBIB-SBMI-1299 Correlative and comparative studies of normal and pathologic states using multi-modal, multi-temporal, and multi-dimensional imaging systems and techniques.
- SBIB-SBMI-1300 Image-guided interventions in integrated diagnostic and therapeutic systems. These often require high performance computing and display for interactive man-machine environments.

SBIB-SBMI-1301	Integration of unique imaging systems to accomplish specific tasks.
SBIB-SBMI-1302	Evaluation of prototype and widely available medical imaging systems and accessories, when there are improvements in underlying technologies.
SBIB-SBMI-1303	Methodology for validating medical imaging systems, including: reference objects, databases, quality control criteria, software metrics, and related components.
SBIB-SBMI-1304	Use of imaging to predict, select, and monitor therapeutic responses.
SBIB-SBMI-1305	Applications of imaging systems and modification of diagnostic methods for use in: screening, characterizing physiological effects (such as normal tissue tolerance or low-level radiation effects), and assessing risk.
SBIB-SBMI-1306	Use of principles of psychophysical experimentation and modeling to develop medical-image-observer performance metrics, calibration standards, and simulations of an ideal observer.
SBIB-SBMI-1307	Development of surrogate endpoints based on quantitative imaging for use in clinical trials of medical devices, pharmaceuticals, and other therapeutic interventions.
SBIB-SBMI-1308	Development and application of standards for control of image quality and imaging software using reusable, portable, and extensible open source approaches.
SBIB-SBMI-1309	Synthesis of new diagnostic agents or therapeutic pharmaceuticals used in medical imaging studies

SBIB - *SBNT*

Small Business Novel Technologies for In Vivo Imaging and Image - SBNT

Descrizione SS

This SBNT section reviews applications dealing with the development and delivery of novel in vivo cancer-specific image acquisition or enhancement technologies and methods for biomedical imaging and image-guided interventions and therapy for cancer

SBIB-SBNT-1321	Novel single and multi-modality molecular imaging and spectroscopy systems
SBIB-SBNT-1322	Novel single and multimodality anatomical and functional imaging systems, methods, agents, and related software
SBIB-SBNT-1323	Development and optimization of efficient imaging systems for cancer screening
SBIB-SBNT-1324	Imaging for diagnosis, staging, or monitoring the effects of cancer therapy
SBIB-SBNT-1325	Image-guided biopsy (IGB), Image-guided therapy (IGT), and Image-guided interventional (IGI) procedures

SBIB - *SBTS*

Small Business Bioengineering, Surgical Sciences, and Technology - SBTS (SBIR/STTR)

Descrizione SS

The Small Business Bioengineering, Surgical Sciences, and Technology Scientific SBNT section Group reviews grant applications for the small businesses initiative programs (Small Business Innovation Research [SBIR] and Small Business Technology Transfer [STTR]) involved in innovative research and technology development of biomedical devices and systems for treating human diseases. They involve integration of biomedical devices into living systems; or propose systematic, quantitative, and integrative approaches to thinking about and addressing problems important to physiology or clinical medicine.

These bioengineering and surgical science projects integrate physical, chemical, or mathematical sciences and engineering principles into the study of biology, medicine, behavior, and health. They develop innovative biologics, materials, processes, implants, and devices, for the prevention, diagnosis, or treatment of disease. Surgical sciences integrate the device and instrumentation applications into living systems. Studies involving minimally invasive surgery, microsurgery, computer-assisted surgery, and robotics are reviewed in this scientific review group. Pre-clinical studies and studies focused on applications of device/instrumentation are included.

SBIB-SBTS-1310	Therapeutic devices and systems: including artificial organs, implantable medical devices, bio-molecule delivery/immobilization devices, and prosthetic devices.
SBIB-SBTS-1311	Advanced techniques and devices that permit tissue engineering, endosurgical approaches, catheter-based surgery, minimally invasive surgery, microsurgical procedures, robotics, and image-guided intervention.
SBIB-SBTS-1312	Development of cellular and tissue-engineered constructs, including: design, construction, and pre-clinical and clinical evaluation of function.

SBIB-SBTS-1313 Development of vertically integrated medical devices, including: pre-clinical human studies, translational medical device development and clinical device validation.

SBIB-SBTS-1314 Optimization of design, development of standards, and monitoring and evaluating medical devices

SBIB - SEED Electromagnetic Devices Special Emphasis Panel - SEED

Descrizione SS The Electromagnetic Devices SEED section reviews applications on the development of algorithms, methods and instrumentation that use electromagnetic technology for imaging and therapeutic uses. Scientific review groups of the SBIB Group, particularly those reviewing applications in surgery and biomedical imaging have shared interests with all the clinical Group

SBIB-SEED-1315 The Electromagnetic Devices Special Emphasis Panel reviews applications on the development of algorithms, methods and instrumentation that use electromagnetic technology for imaging and therapeutic uses

SBIB - ZRCM Computational modeling and sciences for biomedical and clinical applications - ZRCM

Descrizione SS The focus of the ZRCM section is on the development and application of computational modeling and computational sciences to biomedical and clinical problems. This includes methods and techniques from such disciplines as software and hardware engineering, telemedicine, human-computer interaction, advanced computing architectures, and clinical database development, maintenance, and mining

SBIB-ZRCM-1342 The surgical modeling, planning, simulation, surgical training, robotic surgery, perioperative and emergency medicines that include pharmaceuticals, patient assist, monitoring systems and telemedicine.

SBIB-ZRCM-1343 The training and quality control tools for physiological data acquisition, reading, and diagnostic decision making.

SBIB-ZRCM-1344 Data analysis, image construction, anatomical modeling and the modeling of therapy of diseases associated with diagnostic medical imaging.

SBIB-ZRCM-1345 The advanced computing architectures and clinical databases for imaging and physiological data archive and retrieve, data mining, and record management systems.

SBIB-ZRCM-1346 The tissue mechanical property modeling, haptics, computer-aided design of surgical implants and devices.

SBIB-ZRCM-1347 The pharmacokinetic modeling and spatial-temporal modeling that are related to the biomedical imaging, perioperative and emergency medicines, and related organ physiological modeling

VH VH - Vascular and Hematology

Descrizione IRG: The Vascular Biology and Hematology [VH] Group will consider research applications ranging from basic research through clinical studies focused on the circulatory system, both vascular and hematological components. The Vascular Biology study sections are organized around the themes of vascular hemodynamics and hypertension, neural and integrative systems physiology, inflammation and atherosclerosis, and vascular cell and molecular biology. Hematological study sections consider research applications comprising basic and clinical studies focused on normal and abnormal hematopoiesis, blood cells including red cells, granulocytes, monocytes, leukocytes and their diseases and mechanisms of hemostasis and thrombosis. .

Atherosclerosis and Inflammation of the Cardiovascular System - AICS

Descrizione SS

The Atherosclerosis and Inflammation of the Cardiovascular System (AICS) Section reviews applications concerned with inflammation of the vascular system with a focus on atherosclerosis, a chronic inflammatory disease. Effects of major risk factors such as diabetes, aging, and smoking on the vasculature are of interest. This Section will review applications on the pathobiology of the blood vessels leading to atherogenesis, its reversal and prevention. A major contributor to atherogenesis is hyperlipidemia, involving transport and metabolism of cholesterol, lipoproteins and their oxidation derivatives

- VH-AICS-1348 Atherosclerosis and Inflammation of the Cardiovascular System - AICS
- VH-AICS-1349 Immune mechanisms in vascular inflammation; cytokines, chemokines; lymphocyte-endothelial interactions; monocyte subsets; macrophages and T-cell activation and regulation.
- VH-AICS-1350 Lipoprotein oxidation and metabolism; structure and function of apolipoproteins, lipid-metabolizing enzymes and receptors; cholesterol transport and reverse transport; scavenger receptors and ABC transporters; apoproteins B, E and A-1; gene expression and regulation.
- VH-AICS-1351 Atherosclerosis progression and regression; HDL and atheroprotection; lipoprotein interactions with vascular cells and matrix components; foam cell formation; plaque stability and thrombosis; shear stress and cell signaling.
- VH-AICS-1352 Reactive oxygen species (ROS), reactive nitrogen species (RNS), eNOS and NO in vascular injury and endothelial dysfunction; effects of environmental toxins and nutritional components on vascular pathologies.
- VH-AICS-1353 Therapeutic strategies; cellular and animal models for atherosclerosis, restenosis, hyperlipidemia, vascular inflammation, vascular injury, diabetes, autoimmune myocarditis, abdominal aortic aneurysms and vascular calcification

Erythrocyte and Leukocyte Biology - ELB

Descrizione SS

The Erythrocyte and Leukocyte Biology [ELB] Section reviews applications concerned with both basic and applied aspects of the blood system, Emphasis is on hemoglobinopathies, thalassemias; iron and heme metabolism; erythrocyte and granulocyte/monocyte biology, transfusion medicine, and disorders and parasitic infections that involve the formed blood elements

- VH-ELB-1354 Hemoglobin structure, synthesis and biochemistry; blood substitutes; abnormal hemoglobins; developmental globin gene regulation; sickle cell anemia; and gene therapy for globin disorders.
- VH-ELB-1355 Iron and heme metabolism; iron overload states and strategies for the therapeutic intervention; and sideroblastic anemias.
- VH-ELB-1356 Immunohematology and transfusion: immunohematologic disorders; autoimmune hemolytic anemia, neutropenia; blood groups, blood banking, and transfusion medicine.
- VH-ELB-1357 Molecular cell biology, biochemistry, and structure of the formed blood elements: myeloid and erythroid cell membrane proteins and receptors; the interaction of myeloid and erythroid cells with the vascular wall; the granulocyte/monocyte and red cell cytoskeleton.
- VH-ELB-1358 Normal and pathological myelocyte and erythrocyte function.
- VH-ELB-1359 Inherited or acquired hemolytic anemias, including disorders involving the erythrocyte membrane or membrane skeleton and erythroblast biology

Hypertension and Microcirculation - HM

Descrizione SS

The Hypertension and Microcirculation [HM] Section reviews applications involving basic and applied aspects of cardiovascular regulation with focus on the physiology of blood pressure regulation, the pathogenesis of hypertension and the microcirculation. It includes studies on cell surface receptors and signaling processes of various hormones, paracrine, and autocrine and their mechanisms of action as related to hypertension, neural-humoral control of circulation, regional hemodynamics, lymphatic circulation, and microcirculation

- VH-HM-1360 Blood pressure regulation and systemic hypertension. Studies may focus on various regulators of blood pressure including the kidneys, central or peripheral nervous and endocrine systems, and autocrine and paracrine factors. Studies involving surgical, drug or hormonal interventions of hypertension, environmental influences on blood pressure or end organ effects of hypertension.

- VH-HM-1361 Neural mechanisms of cardiovascular regulation. In particular, vertebrate animal studies of autonomic physiology involving all aspects of reflex arcs and central mechanisms including, physiology, pharmacology and receptor mechanisms.
- VH-HM-1362 Molecular/cellular/biochemical/genetic studies of hypertension. Genetic linkage and association studies, candidate gene analyses, or epigenetics in humans and animal models of genetic hypertension. Generation of hypertension models by transgenic/knockout and gene expression analyses or gene transfer approaches in hypertension.
- VH-HM-1363 Methodologies in the measurement and recording of blood pressure and regional measurements of blood flow including cerebral, splanchnic, skin, skeletal muscle, vasa vasorum, and renal vessels (excluding pulmonary circulation).
- VH-HM-1364 Microcirculatory and lymphatic functions. Studies on rheology, capillary pressure and fluid exchange and nutrient delivery, arteriole/vein/venule and endothelial cell function, vascular permeability, autoregulation, response to metabolism, blood-brain barrier, propulsion of lymph and lymphatic tone, and pathophysiological processes contributing to primary and secondary lymphedema.
- VH-HM-1365 Microcirculatory biophysics and bioengineering. Studies may focus on mechanotransduction of microvascular wall, fluid dynamics and mechanics in the microcirculation, computational modeling and engineering of microvascular function and structure, structural adaptation and remodeling of the vascular system in hypertension, e.g., increased peripheral resistance and microvascular rarefaction, and microvascular injury related to hypertension.

VH - HP

Hematopoiesis - HP

Descrizione SS

The Hematopoiesis [HP] Section reviews applications involving both basic and applied aspects of normal and abnormal hematopoiesis, including stem cell biology, hematopoietic growth factors and their receptors, leukemias and leukemogenesis, bone marrow failure syndromes, myeloproliferative syndromes, stem cell transplantation, and hematopoietic cell gene therapy.

- VH-HP-1366 Hematopoiesis and Growth Factors: Hematopoietic progenitors; Hematopoietic microenvironment/stromal cells; Transcriptional control of Hematopoiesis; Signal transduction in relation to hematopoiesis.
- VH-HP-1367 Hematopoiesis and Growth Factors: Hematopoietic progenitors; Hematopoietic microenvironment/stromal cells; Transcriptional control of Hematopoiesis; Signal transduction in relation to hematopoiesis.
Stem cell biology: Hematopoietic stem and progenitor cells; Embryonic stem cells as models of hematopoiesis; epigenetic regulation of stem cell gene transcription; Genetic modification of hematopoietic stem cells; Ex vivo expansion of hematopoietic stem cells.
- VH-HP-1368 Myelopoiesis: Differentiation of myeloid cells: Granulocyte biology, function, and physiology; Monocyte/macrophage biology, function, and physiology; Molecular biology of myeloid receptors & proteins; Oxidant stress; Apoptosis; Leukemia (AML or CML); Myelodysplasia; Myeloproliferative disorders.
- VH-HP-1369 Lymphocytes: Lymphocyte function; Differentiation of B lymphocytes; Differentiation of T lymphocytes; Lymphocytic leukemias (ALL, CLL, MLL) and lymphomas
- VH-HP-1370 Thrombopoiesis; Thrombopoietin; Megakaryocytopoiesis; Megakaryocyte differentiation; Hemangioblasts
- VH-HP-1371 Erythropoiesis: Differentiation of erythroid progenitors and precursors; Stress erythropoiesis; Erythropoietin; Erythroleukemia; Sickle cell disease; Thalassemia
- VH-HP-1372 Bone marrow transplantation; Stem cell transplantation; Homing; Migration; Adhesion; Xenografts; Xenotransplantation; Gene therapy
- VH-HP-1373 Bone marrow failure; Bone marrow failure syndromes, e.g., Fanconi Anemia (FA), Diamond Blackfan Anemia (DBA), Shwachman Diamond Syndrome
- VH-HP-1374 Oncogenes; Oncogene expression; Tumorigenesis; Hematologic malignancies

VH - HT

Hemostasis and Thrombosis - HT

Descrizione SS

The Hemostasis and Thrombosis [HT] Section reviews applications involving basic and applied aspects of the blood and vascular elements associated with hemostasis, thrombosis, and interactions with vasculature. Studies using cellular, biochemical, biophysical, immunological, genetic, pharmacological and molecular biological approaches to define normal and pathological processes are reviewed

- VH-HT-1375 Mechanisms of hemostasis: blood coagulation, structure/function of coagulation proteins, congenital and acquired bleeding disorders; gene therapy for treatment of hemostatic disorders.

- VH-HT-1376 Mechanisms of thrombolysis/fibrinolysis: fibrin structure; regulatory mediators including activators and inhibitors.
- VH-HT-1377 Platelet biology: adhesion, aggregation, secretion; signal transduction mechanisms; platelet turnover; megakaryocyte biology; integrin receptor biology; platelet interactions with endothelial cells and leukocytes, congenital platelet disorders.
- VH-HT-1378 Thrombosis: venous and arterial; rheology; inflammatory cytokines; mechanisms of atherothrombosis; tissue factor expression; congenital risk factors, diagnosis and pharmacologic intervention.
- VH-HT-1379 Vascular biology: vessel wall interactions with the formed blood elements, including pro- and anti-coagulant functions, expression of tissue factor, matrix proteases, and soluble angiogenic factors from blood.

VH- *SBHE* **Hematology Small Business Activities - SBIR/STTR - SBHE**

Descrizione SS The SBHE section reviews Small Business Innovation Research (SBIR) and the Small Business Technology Transfer Research (STTR) grant applications concerned with basic research through clinical studies of hematology

- VH-SBHE-1393 Development of hematological diagnostic devices and assays
- VH-SBHE-1394 Storage of whole blood and its components, development of blood substitutes, and transfusion medicine
- VH-SBHE-1395 Hematological stem cell culture, stem cell therapy and hematopoiesis
- VH-SBHE-1396 Therapy for globin disorders
- VH-SBHE-1397 Normal and pathologic hemostasis and thrombosis including hemophilia and gene therapy anticoagulated therapy

VH- *SECH* **Clinical Hematology Special Emphasis Pane -SECHI**

Descrizione SS The Clinical Hematology Special Emphasis Panel [SECH] reviews applications proposing single-site clinical studies related to inherited blood disease (including gene therapy or genetics), or relating to red blood cell/monocyte/leukocyte biology, hematopoiesis, hemostasis and thrombosis, or inflammation. Multi-center clinical trials are not appropriate for this panel

- VH-SECH-1392 Applications proposing single-site clinical studies related to inherited blood disease (including gene therapy or genetics), or relating to red blood cell/monocyte/leukocyte biology, hematopoiesis, hemostasis and thrombosis, or inflammation. Multi-center clinical trials are not appropriate for this panel

VH- *SEVB* **Vascular Biology Special Emphasis Panel - SEVB**

Descrizione SS The Vascular Biology Special Emphasis Panel (SEVB) reviews (no other area) applications that would otherwise be reviewed by either the Vascular Cell and Molecular Biology (VCMB) or Atherosclerosis and Inflammation of the Cardiovascular System (AICS) Sections. Accordingly, it reviews applications involving the cell and molecular biology of blood vessels from major arteries to the microcirculation as well as those related to inflammation of the vascular system including atherosclerosis, diabetes, transplantation, aging, lipoproteins, autoimmunity and infection.

- VH-SEVB-1387 Vascular homeostasis and remodeling: signaling;extracellular matrix and metalloproteinases; receptor biology; reactive oxygen species; Injury/repair, angiogenesis; angioplasty; restenosis; re-endothelialization; stem cells, gene therapy.
- VH-SEVB-1388 Atherosclerosis and inflammation: immune mechanisms in vascular inflammation: animal models, diabetes, vasculitis, regression of atherosclerosis; plaque stabilization.
- VH-SEVB-1389 Transcriptional and posttranscriptional regulation as related to vascular biology; genomics, microarrays, bioinformatics, protein biochemistry of the vascular cell; proteomics.
- VH-SEVB-1390 Endothelial barrier function and platelet endothelial interactions; mechanotransduction; hemodynamic forces; stress/strain.
- VH-SEVB-1391 Lipoprotein metabolism and transport; lipoprotein interaction with vascular cells; metabolic syndrome; obesity; HDL; LDL modifications, oxidation; vascular lipoprotein receptors; novel interventional therapies for hyperlipidemia; lipid metabolic disorders (genetic or acquired).

Descrizione SS

The Vascular Cell and Molecular Biology [VCMB] Section reviews applications involving the cell and molecular biology of blood vessels ranging from major arteries to the microcirculation. Studies using cellular, biochemical, biophysical, immunological, genetic, pharmacological, and molecular biological approaches to define vascular homeostasis and dysfunction are reviewed. A principal focus is on the biology of the endothelium, vascular smooth muscle cell, as well as adventitial cells and pericytes

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| VH-VCMB-1380 | Vascular cell growth control; apoptosis, signaling pathways, intercellular communication. |
| VH-VCMB-1381 | Transcription and posttranscriptional related to vascular biology. |
| VH-VCMB-1382 | Vasomotor activity, including vasocontraction and relaxation, leukocyte trafficking, adhesion molecules; chemokines, cytokines; intercellular signaling; reactive oxygen and nitrogen species; Endothelial barrier function; extracellular matrix-mediated signaling. |
| VH-VCMB-1383 | Injury/repair and associated angiogenesis and postnatal angiogenesis; remodeling; angioplasty; restenosis; grafts; stents; re-endothelialization; stem cells. |
| VH-VCMB-1384 | Mechanotransduction at the cellular level: hemodynamic forces; stress/strain; force transmission coupling in cells; mechanosignaling. |
| VH-VCMB-1385 | Protein biochemistry and structure biology of the vascular cells; proteomics; cellular dynamics through 3-D imaging; cytoskeleton; vesicular traffic. |
| VH-VCMB-1386 | Vascular contribution and response to coagulation: thrombosis and fibrinolysis mechanisms mediated by the vascular cells; platelet-endothelial interactions |
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Classificazione Progetti Area Veterinaria –VET

ANHE - Animal Health

code	DESCRIZIONE
VET-ANHE-1387	Improving preparedness for emerging and exotic diseases: research on pathogenic, clinical, and epidemiological aspects in relation to risk pathways identification, prevention strategies development and early warning systems and communication networks to prevent outbreaks.
VET-ANHE-1388	Animal neuropathologies, with particular reference to atypical forms.
VET-ANHE-1389	Emerging and re-emerging viral zoonoses: study of the pathogenic mechanisms and virus-host interaction taking into account interacting cells and molecules involved in virulence, pathogenesis, immunity and escape strategies to improve surveillance and risk assessment.
VET-ANHE-1390	Surveillance of diseases at the environment/wild-domestic/humans interface: study on the ecology and epidemiology of pathogens in wild-animal populations for risk pathways identification.
VET-ANHE-1391	Studies on new methodologies to improve the arthropod vector control, including their ability to transmit pathogens such as reducing vector capacity and blocking pathogens transmission.
VET-ANHE 1392	development and validation of rapid tests to identify pathogens including their virulence, epidemiology and resistance pattern (molecular analysis, incl. nanotechnology e.g. lab-on-chip).
VET-ANHE-1393	development and validation of rapid tests to identify pathogens including their virulence, epidemiology and resistance pattern (molecular analysis, incl. nanotechnology e.g. lab-on-chip).
VET-ANHE-1394	Improving sustainability and efficacy of the surveillance of animal diseases: development of new diagnostic protocols and tools ¿easy to use¿, rapid, reliable, and inexpensive.
VET-ANHE-1395	Research on pathology and epidemiology of neoplasie in animals for animal health aspects and potential public health implications.
VET-ANHE 1396	Study on defence mechanisms, cytokine production and cell-mediated immunity, and post-infection/ post-vaccination immunity, including modulation of the host immune response to improve the level of protection, elucidation of the mucosal immune mechanisms, particularly of the gastro-intestinal tract and the respiratory tract, and genetic engineering / delivery of selected molecules.
VET-ANHE-1397	Study on defence mechanisms, cytokine production and cell-mediated immunity, and post-infection/ post-vaccination immunity, including modulation of the host immune response to improve the level of protection, elucidation of the mucosal immune mechanisms, particularly of the gastro-intestinal tract and the respiratory tract, and genetic engineering / delivery of selected molecules.
VET-ANHE-1405	Study and development of new diagnostic protocols and tools that are easy to use, rapid, reliable, and with a contained cost, to improve surveillance systems for infectious diseases and pathologies of interest to veterinary medicine
VET-ANHE-1406	Development of epidemiological tools for identifying areas at particular risk for health emergencies, including those consequent to natural disasters, in particular, information systems based on geographic information systems (GIS);
VET-ANHE-1407	Studies for improving epidemiologic surveillance networks and communication systems, so as to allow the circulation of information in real-time among various stakeholders in public health

code	DESCRIZIONE
VET-ANHE-1392	Development and validation of animal vaccines, with particular focus on new generation vaccines and the development of assays to distinguish more reliably between infected and vaccinated animals.
VET-ANHE-1396	Promoting prudent use of antimicrobials in farming animals: focusing research on antimicrobial and anthelmintic resistance, development of alternative curative and preventive therapies, like biotherapeutics and other potential alternatives, study on prevalence of resistance in gut (micro-organisms), development of rapid tests for identifying resistance, analysis and mitigation of resistance genesis with emphasis on resistance critical for human infections.

ANWE - Animal welfare –

code	DESCRIZIONE
VET-ANWE-1399	Promoting research on the interface between animal health and welfare: development of practical animal-based indicators of animal health and welfare, development and implementation of new husbandry strategies ensuring good health and
VET-ANWE-1400	Study and definition of wellbeing indicators in farm and wild animals as biomarkers for the assessment of the environmental quality of agriculture areas and aquatic ecosystems
VET-ANWE-1401	Study and definition of wellbeing indicators in farm and wild animals as biomarkers for the assessment of the environmental quality of agriculture areas and aquatic ecosystems
VET-ANWE-1402	Validation of measurable and practical, indicators for both health and welfare assessment under indoor and outdoor conditions (including reared fish species and environment): Animal-based, with a focus on behavioural and physiological indicators; Herd-based, e.g. outputs from slaughterhouses including ante- and post-mortem measures, transport, and disease sampling outcomes (e.g. Salmonella, Campylobacter etc), data on antibiotics usage.
VET-ANWE-1403	Evaluation of the efficiency of management practices (e.g. pre- and peri-natal, during rearing and at specific handling events e.g. at weaning) and of good human-animal relationships in animal production for eliciting positive emotional state and reducing the animals' susceptibility to disease.
VET-ANWE-1404	Studies for improving housing, handling and for the assessment of pain, suffering and distress in experimental animals and for the definition of new wellbeing indicators.
VET-ANWE-1422	Study, definition, and development of methods for evaluating physiological indicators, with particular regard to pathologies characterised by immune deficiencies, so as to determine the wellbeing of food-producing animals, including fish species, in all phases of farming and transport
VET-ANWE-1423	Definition of protocols for the study of behavioural parameters in food-producing animals so as to gain a better understanding of the human-animal relationship
VET-ANWE-1424	Research on methods for rationing and use of probiotics and of immuno-stimulants aimed at improving wellbeing and reducing the use of antimicrobials
VET-ANWE-1425	Study and identification of physiological and behavioural parameters related to intensive farming practices and transport
VET-ANWE-1426	Studies for improving the farming and handling conditions for experimental animals
VET-ANWE-1427	Study and validation of alternatives to animal testing (e.g., mathematic or computer models and systems, cell cultures);
VET-ANWE-1428	Studies for identifying standards of wellbeing for dogs housed in kennels
VET-ANWE-1405	Study and validation of alternatives to animal testing (e.g., mathematic or computer models and systems, cell cultures).

FOSA - Food Safety -

code	DESCRIZIONE
VET-FOSA-1408	Development of new methods and approaches to improve the efficiency and effectiveness of genetically modified organisms (GMOs) detection and control in food.
VET-FOSA-1409	Development of integrated models for the identification of chemical, biological and nutritional risk pathways for catering enterprises considering the general population and in vulnerable sub-populations .
VET-FOSA-1410	Study of the risks related and development of risk-reduction systems to ensure safety and sustainability of traditional and typical food productions in Italy.
VET-FOSA-1411	Development of innovative methods for the detection and quantification of chemical substances of different origin (pharmaceutical, environmental, biological or consequent to industrial transformation) in foods and the evaluation of their impact on consumer health.
VET-FOSA-1412	Study of systems for decreasing microbial and chemical contaminants in foods along the production system to reduce the risk of human population.
VET-FOSA-1413	Development diagnostic methods, transmission patterns, and control models in foodborne viruses.
VET-FOSA-1414	Development of effective surveillance programs for ready-to-eat (RTE) foods to identify the main hazards, to quantify the risk and to define possible preventive measures.
VET-FOSA-1415	Development of innovative prevention measures and decontamination methods for the reduction of the risk of mycotoxins in food products of plant origin and in animal feed.
VET-FOSA-1416	Integrating surveillance data and information from different sources for the development of exposure models to pesticides of human population with particular focus on vulnerable subpopulation (e.g. infants).
VET-FOSA-1418	Study and definition of environmental quality parameters (soil, water, air) needed to support food safety and security of Mediterranean animal farming systems, focusing also the sustainability of the new farming system in the medium/long term.
VET-FOSA-1419	Development of methods and strategies for effective risk communication concerning food safety and nutrition.
VET-FOSA-1420	Study of systems for preventing, controlling, and eliminating the presence of mycotoxins in food products of plant origin and in animal feed
VET-FOSA-1421	Study of systems for evaluating and decreasing risks related to microbic and chemical contaminants in foods meant for human consumption, along the entire production process
VET-FOSA-1417	Research on the potential use of food producing animals as biomarkers of environmental health and food safety: development of health-related indicators and monitoring strategies.
VET-FOSA-1407	Development and application of genomics to improve the control of infectious epidemics and foodborne outbreaks through rapid identification and tracing of pathogens.