



## CSR Fellowship Study Sections Revised Descriptions

### General Information

The Center for Scientific Review (CSR) reviews the following kinds of applications for individual National Research Service/Ruth L. Kirschstein Awards [NRSA]:

- Predoctoral applications [F30 and F31 awards]
- Postdoctoral applications [F32 awards]
- Senior fellowship applications [F33 awards]

### Fellowship Application Review by IC

Certain Institutes and Centers (ICs) review the fellowship applications assigned to them: AHRO, NCCAM, NIAAA, NIDA, NIDCD, NIDCR, NINR, and NLM. NINDS reviews F30s and a special F31 Medical Scholars program. NIGMS reviews the Minority Access to Research Careers/MARC F31, F34, F36; CSR reviews the MARC F33.

### F31 Predoctoral Fellowship Awards for Minority Students and Students with Disabilities

Review of F31 applications from minority students and students with disabilities is handled by separate special emphasis panels, typically one for each of the four review divisions in CSR. These predoctoral applications have special receipt dates, May 1 and November 15.

### Review Criteria and Procedures

Applicants should refer to the appropriate NRSA Program Announcement listing and PHS 416-1 application instruction sets for eligibility, application requirements, and other special features of the individual fellowship programs (<http://grants.nih.gov/grants/funding/416/phs416.htm>). Additional information about policies and procedures is available online to help applicants prepare their applications (<http://grants.nih.gov/grants/funding/haveques.htm>).

### Receipt Dates

NIH reviews fellowship applications in three review cycles, with submission deadlines each year of:

- April 5
- August 5

- December 5

Exceptions to these dates are NRSA Individual Pre-doctoral (F31) Fellowships for Minority Students and Students with Disabilities (see above). Upon submission, each application is assigned to an appropriate study section for review and to an Institute or Center for possible funding. CSR informs each applicant of assignment information by mail.

### **Contact Information**

Questions regarding assignments may be directed to the Division of Receipt and Referral (DRR), CSR, at (301) 435-0715. These and questions pertaining to the review process may also be directed to the Scientific Review Administrator (SRA) responsible for the appropriate study section. A list of SRAs and meeting dates for each of these fellowship study sections is available at <http://www.csr.nih.gov/Committees/rosterindex.asp>. After review has occurred, primary contact responsibility shifts to the appropriate Program Director/Administrator. NIH Institutes and Centers have different scientific purviews and support a variety of programmatic goals and initiatives. Therefore, in the early stages of preparing a fellowship application, applicants are encouraged to contact the prospective NIH awarding component to discuss their specific program priorities and policies with regard to fellowships. A list of NIH training program contacts can be found at: <http://www.nimh.nih.gov/grants/nihtrainingcontacts.pdf>. Questions regarding NIH training and career development program policies should be directed to Dr. Walter Goldschmidts, Acting NIH Research Training Officer, [goldschw@od.nih.gov](mailto:goldschw@od.nih.gov), 301 451-4225

## **F01 Fellowship Study Section**

### **Brain Disorders and Related Neuroscience [Brain Disorders and Clinical Neuroscience (BDCN) Integrated Review Group]**

The F01 fellowship special emphasis panel reviews fellowship applications in the areas covered by the BDCN IRG. The emphasis in F01 is on clinical disorders of the human brain and related mammalian models of disease. Areas reviewed include: clinical neurosciences and disease, neuroplasticity and neurotransmitters, cell death and injury as it applies to neurodegeneration, clinical neuroimmunology and brain tumors, developmental brain disorders, the neural bases of psychopathology and addiction, sleep disorders, genetic basis of central nervous system disorders, and eye disease. The F01 study section reviews studies of in vitro systems,

animal models, and patient-oriented research. Examples of specific areas covered are listed below

- Stroke/ischemia/central nervous system injury
- Epilepsy
- Movement disorders, Parkinson's disease
- Autism, schizophrenia, models for disorders
- Central nervous system consequences of drug exposure
- Alzheimer's disease
- Plasticity and recovery
- Anterior eye disease
- Central nervous system tumors
- Multiple sclerosis
- Behavioral, cognitive and emotional disorders

Shared interests:

With F02: If applications emphasize studying neural systems without reference to disease, they may fit better in the F02 fellowship study sections. If applications emphasize studying the systems with reference to a neurological disorder, they may fit better in F01. With respect to the visual system, F01 may be more appropriate for fellowship applications dealing with anterior eye diseases; F02B may be more appropriate for fellowship applications dealing with visual processing and related portions of the brain, eye, and oculomotor system.

With F03: If applications emphasize molecular and/or basic mechanisms of neural development and function, then assignment to the F03 fellowship study sections may be appropriate; if applications emphasize disease processes, then assignment to the F01 fellowship study section may be appropriate.

With F05 in the area of the anterior eye: Fellowship applications on diseases of the anterior eye may be assigned to F01, while those on basic biology may be assigned as appropriate, e.g., F05 may review fellowship applications on the basic cell biology of the lens.

With the Biobehavioral and Behavioral Processes (BBBP) Integrated Review Group: If the application deals with neural substrates of disorders and imaging techniques such as MRI, fMRI, etc. assignment to F01 may be appropriate. If emphasis is on psychology and cognition, assignment to BBBP may be appropriate.

## **F02 Fellowship Study Sections [Integrative, Functional and Cognitive Neuroscience (IFCN) Integrated Review Group]**

### **F02A Behavioral Neuroscience**

The F02A study section reviews fellowship applications generally concerned with functions of the limbic system and aimed at furthering our understanding of how the nervous system is organized and functions at an integrative, systems level. Areas reviewed include: studies of the neural basis of emotional and motivational behavior; learning and memory; regulation of neural 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; neurotoxicology. Examples of specific areas covered are listed below.

- Emotion and motivation
- Learning and memory
- Neuroendocrinology
- Neuroimmunology
- Circadian rhythms
- Neurotoxicology

Shared interests:

With F02B: Fellowship applications concerned with functions of the limbic system may be assigned to F02A; fellowship applications concerned with sensory, motor, and cognitive functions may be assigned to F02B.

With F01: If applications emphasize studying neural systems without reference to disease, they may fit better in the F02 fellowship study sections. If applications emphasize studying the systems with reference to a neurological disorder, they may fit better in F01.

With F03: Fellowship applications addressing the topics listed above using cellular and systems neuroscience approaches may be appropriate for F02A; fellowship applications addressing the topics listed above using molecular, cellular, or developmental neuroscience approaches may be appropriate for F03.

With F06: For studies in the area of endocrinology, F06 may be considered when the focus is not on neural systems.

With F10: Applications concerning neurotoxicology may be appropriate for F02A; applications concerning toxicology of the renal, digestive systems, respiratory, or cardiovascular systems may be appropriate for F10.

With the Behavioral and Biobehavioral Processes (BBBP) Integrated Review Group: if the application employs primarily behavioral approaches, assignment to BBBP may be appropriate.

## **F02B Sensory, Motor, and Cognitive Neuroscience**

The F02B study section reviews fellowship applications in sensory, motor, and cognitive neuroscience research aimed at furthering our understanding of how the nervous system is organized and functions at an integrative, systems level. The emphasis is on understanding normal sensory, motor or sensorimotor function, dysfunction, development, maturation and aging, recovery from injury, and perceptual and sensory perturbations. This study section also reviews fellowship applications on the integration of multisensory information, mechanisms underlying neural coding of complex stimuli and attention and effects on information processing in the nervous system. Examples of specific areas covered are listed below.

- Attention

- Motor function
- Pain
- Sensorimotor function
- Somatosensory function
- Central visual processes

Shared interests:

With F02A: Fellowship applications concerned with functions of the limbic system may be assigned to F02A; fellowship applications concerned with sensory, motor, and cognitive functions may be assigned to F02B.

With F01: If applications emphasize studying neural systems without reference to disease, they may fit better in the F02B. If applications emphasize studying the systems with reference to a neurological disorder, they may fit better in F01. With respect to the visual system, F01 may be more appropriate for fellowship applications dealing with anterior eye diseases; F02B may be more appropriate for fellowship applications dealing with visual processing and related portions of the brain, eye, and oculomotor system.

With the F03 study sections: Fellowship applications addressing the topics listed above using cellular and systems neuroscience approaches may be appropriate for F02B; fellowship applications addressing the topics listed above using molecular, cellular, or developmental neuroscience approaches may be appropriate for F03.

With F05: Applications dealing with the biology and diseases of the posterior eye may be assigned to F05; applications dealing with visual processing and related portions of the brain, eye, and extraocular muscle system may be assigned to F02B.

With the Behavioral and Biobehavioral Processes (BBBP) IRG: Applications on sensory, motor, or cognitive neuroscience at an integrative level may be assigned to F02B; applications primarily on behavioral science may be assigned to BBBP.

## **F03 Fellowship Study Sections [Molecular, Cellular and Developmental Neuroscience (MDCN) Integrated Review Group]**

### **F03A Biochemical and Molecular Neuroscience**

The F03A study 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; and the mechanisms that specify or influence migratory events and the development, aging, and regeneration of neuronal connectivity. Examples of specific areas covered, as they relate to neuronal

and glial cells, are listed below.

- Synaptic plasticity
- Trafficking
- Cytoskeleton
- Progenitor and stem cells
- Development
- Differentiation
- Axon outgrowth
- Regeneration
- Glial biology/inflammation
- Myelination
- Circadian mechanisms
- Degeneration/apoptosis

Shared interests:

With F03B, in the areas of synaptic function and synaptic plasticity: Applications that emphasize biochemical and molecular or cellular approaches may be assigned to F03A; applications that emphasize physiological, pharmacological and biophysical approaches may be assigned to F03B.

With F01, in the areas of neurodegenerative diseases and inflammation: If applications emphasize biochemical and molecular or cellular approaches, then assignment to the F03 fellowship study sections may be appropriate. If applications emphasize disease processes, then assignment to the F01 fellowship study section may be appropriate.

With F02A, in the areas of neuroimmunology and circadian rhythms: Applications emphasizing systems approaches may be assigned to F02A; applications emphasizing biochemical and molecular or cellular approaches may be assigned to F03A.

With F04B regarding studies of membrane recycling, protein structure-function and cytoskeleton structure: Applications concerned with neuronal function and structure may be assigned to F03A; applications concerned with quantitative analysis of biomolecular interactions and defining specific folding conformations may be assigned to F04B.

With F05 in the areas of development, differentiation, progenitor and stem cells, and cytoskeleton: Applications focusing on these functions in neuronal, glial, retinal, and other excitable cells may be assigned to F03A; applications focusing on basic cell structure, function, and regulation may be assigned to F05 if using neural cells as model systems. Also, F05 may review fellowship applications on the cell biology of the retina.

### **F03B Biophysical and Physiological Neuroscience**

Areas of interest encompassed by this study 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; and the development of therapeutic compounds. Examples of specific areas covered, as they relate to neuronal and glial cells, are listed below.

- Signal transduction
- Ion channels
- Transporters
- Neuropharmacology
- Neuroendocrinology
- Neuromodulators
- Oxidative metabolism
- Gap junctions and connexins
- Neurotransmitter synthesis
- Electrophysiology
- Imaging
- Medicinal Chemistry

Shared interests:

With F03A, in the areas of synaptic function and synaptic plasticity: Applications that emphasize biochemical and molecular or cellular approaches may be assigned to F03A; applications that emphasize physiological, pharmacological and biophysical approaches may be assigned to F03B.

With F02B, in the area of vision: Studies of integrated circuits, systems, and behavior may be appropriate for F02B; studies of signal transduction and related processes that occur at the single cell level with emphasis on cell electrophysiology, molecular biophysics, and neurochemical pathways may be appropriate for F03B.

With F04B regarding studies of membrane recycling, protein structure-function and cytoskeleton structure: Applications concerned with neuronal function and structure may be assigned to F03B; applications concerned with quantitative analysis of biomolecular interactions and defining specific folding conformations may be assigned to F04B. Also, studies of signal transduction and related processes that occur at the single cell level with emphasis on cell electrophysiology, molecular biophysics, and neurochemical pathways may be appropriate for F03B; studies of signal transduction and related processes that occur at the molecular level with emphasis on basic biochemistry or biophysics may be appropriate for F04B.

With F06, in the area of endocrinology: Applications that involve neural or glial cells may be appropriate for F03A; applications that involve endocrine or reproductive cells may be appropriate for F06.

**F04 Fellowship Study Sections**  
**[Biophysical and Chemical Sciences (BPC) Integrated**  
**Review Group]**  
**F04A      Chemical and Bioanalytical Sciences**

F04A reviews fellowship applications covering the chemistry of biologically and medically important molecules. This includes the synthesis, isolation and structural determination of small molecules as well as the chemistry of drug discovery and biological processes; structure-function relationships of enzymes and metalloproteins by kinetic and substrate analog studies; characterization of the chemistry of biologically relevant macromolecules including biopolymers and biomaterials; and development of analytical instrumentation and biosensors. Examples of specific areas covered are listed below.

- Chemical synthesis of therapeutic, pharmacological, biological, or biochemical compounds
- Development and optimization of synthetic reactions, including analysis of reaction mechanisms and kinetics
- Biosynthetic or biomimetic synthesis of natural products, including design of enzyme substrates or inhibitors
- Isolation, structural determination, and chemical synthesis of complex natural products
- Enzyme mechanism studies, including mutagenesis, analyses of transient and transition states, and steady state kinetics
- Bioinorganic chemistry, including synthesis and properties of coordination compounds and their thermodynamics, kinetics and structures
- Function and mechanism of metalloproteins, including their spectroscopic characterization
- 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
- RNA enzymology, including catalytic RNA and ribozymes

Shared interests:

With F04B regarding the characterization of structure-function relationships of enzymes: Applications concerned with analysis of mechanism by inhibitor or kinetics studies may be assigned to F04A; applications concerned with structure determination by X-ray crystallographic or NMR spectroscopic methods may be assigned to F04B.

With F05 regarding enzyme mechanism and interaction: Applications that are concerned with the mechanism of an enzyme or a system of enzymes may be assigned to F04A; applications concerned with the effects on cellular function may be assigned to F05.

With F09 regarding studies of cancer therapeutic agents: Applications that are concerned with developing and synthesizing new and different compounds may be assigned to F04A; applications that are concerned with studying the efficacy and safety of anticancer compounds may be assigned to F09.

## **F04B      Biophysical and Biochemical Sciences**

F04B reviews fellowship applications covering structure and biophysical

behavior and dynamics of biological macromolecules. This includes applications concerned with the structure-function relationships of proteins, nucleic acids, glycoproteins, lipid bilayers and membrane proteins; X-ray crystallography, multi-dimensional NMR, electron microscopy, circular dichroism, fluorescence, and computational methods; single molecule dynamics and interactions by fluorescence and microscopic techniques; and molecular interactions for defining and maintaining cellular shape and function. Examples of specific areas covered are listed below.

- Proteomics, global approaches to protein function, and posttranslational modification
- Computational data mining for analysis of proteins and related microarrays
- Physical chemistry of biological macromolecules, including conformation and structure of proteins and nucleic acids
- Spectroscopic methods, including multi-dimensional nuclear magnetic resonance, X-ray crystallography, Raman and FTIR
- Protein and nucleic acid folding and conformation by experimental and computational methods
- Thermodynamics of macromolecular interactions, including isothermal calorimetry
- Kinetic analyses, including pH or temperature jump methods
- Structure and physical chemistry of lipid bilayer membranes and related model systems
- Physical chemical instrumentation, including development of new approaches and application of computers to such instrumentation
- Indirect methods for structure and dynamics determinations, including fluorescence dye labeling and tethering
- Carbohydrate biochemistry and glycoproteins, including synthesis and processing
- Signal transduction at molecular or subcellular levels, including protein structure, function, and enzymology
- Extracellular matrix at molecular or subcellular levels
- Motility and cytoskeleton at molecular or subcellular levels

Shared interests:

With F04A regarding the characterization of structure-function relationships of enzymes: Applications concerned with analysis of mechanism by inhibitor or kinetics studies may be assigned to F04A; applications concerned with structure determination by X-ray crystallographic or NMR spectroscopic methods may be assigned to F04B.

With F03A and F03B regarding studies of membrane recycling, protein structure-function and cytoskeleton structure: Applications concerned with neuronal function and structure may be assigned to F03A or F03B; applications concerned with quantitative analysis of biomolecular interactions and defining specific folding conformations may be assigned to F04B. Also, studies of signal transduction and related processes that occur at the single cell level with emphasis on cell electrophysiology, molecular biophysics, and neurochemical pathways may be appropriate for F03B; studies of signal transduction and related processes that occur at the molecular level with emphasis on basic biochemistry or biophysics may be appropriate for F04B.

With F05 regarding cellular structure and function: Applications that are

concerned with the molecular interactions among molecules that affect cellular structure may be assigned to F04B; applications that are concerned with structural and functional studies of cells and cell components when the emphasis is on molecular and cell biological context may be assigned to F05.

With F08: Applications focused on enzymological or structural aspects of nucleic acids and nucleic acid protein interactions may be assigned to F04B; applications focused on mechanisms of DNA replication/repair and gene expression/regulation may be assigned to F08. However, a biophysical study of DNA or RNA may be assigned to F04B, not F08.

With F09: Applications that are concerned with the physical chemistry and structure of proteins, lipids, and other biopolymers may be assigned to F04B; applications that are concerned with studying the properties of cancer specific proteins, lipids, and related compounds may be assigned to F09.

## **F05 Fellowship Study Section Cell Biology and Development [Cell Development and Function (CDF) IRG]**

F05 reviews fellowship applications in the broad areas of molecular, cellular, and developmental biology when the research focus is to understand basic principles of cell structure, function, regulation, and differentiation. The study section encompasses the scientific disciplines covered by the Cell Development and Function (CDF) IRG and the Biology of Development and Aging (BDA) IRG. Examples of specific areas covered are listed below.

- Gene expression and its regulation, including chromatin structure, transcription, RNA processing, translation, and RNA stability
- Nuclear organization, including chromosomal organization and nuclear import and export
- Biogenesis, organization, and functions of the plasma membrane and endomembrane organelles, including transmembrane transport, vesicular transport, macromolecular trafficking, and autophagy
- Protein stability and turnover, including chaperone function and ubiquitin-based degradation and related processes
- Signal transduction at the cellular level
- Cell cycle and cell growth regulation
- Cell senescence and cell death (apoptosis)
- Cytoskeleton and cell motility
- Cell adhesion
- Mitosis, meiosis, and cytokinesis
- Cell polarity
- Extracellular matrix, including its biogenesis, organization, and interactions with the cell surface
- 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

Shared interests:

With F01 in the area of the anterior eye: Fellowship applications on diseases

of the anterior eye may be assigned to F01, while those on basic biology may be assigned as appropriate, e.g., F05 may review fellowship applications on the basic cell biology of the lens.

With F03A in the areas of development, differentiation, progenitor and stem cells, and cytoskeleton: Applications focusing on these functions in neuronal, glial, retinal and other excitable cells may be assigned to F03A; applications focusing on basic cell structure, function, and regulation may be assigned to F05 if using neural cells as model systems. Also, F05 may review fellowship applications on the basic cell biology of the retina.

With F04B regarding cellular structure and function: Applications that are concerned with the molecular interactions among molecules that affect cellular structure may be assigned to F04B; applications that are concerned with structural and functional studies of cells and cell components when the emphasis is on molecular and cell biological context may be assigned to F05.

With F06: Applications that focus on signal transduction at the cellular and molecular level in context of cell division, cell cycle, cell senescence and death could be assigned to F05. All processes that address hormone effects in the context of gonadal development through implantation of the embryo, as well as aspects of all stages of pregnancy, parturition, neonatal development and maternal/fetal physiology could be assigned to F06. Applications that focus on stem cell transformation and differentiation are of interest to both panels and should be assigned based on the thrust of the application with F05 more concerned with the basic process of cellular differentiation and F06 more concerned with the endocrinology of the stem cell line.

With F07: F05 may review fellowship applications that utilize cells of the immune system as models to study basic cell function, regulation, and intracellular signaling; F07 may review fellowship applications on 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.

With F08 regarding DNA replication and repair and telomere structure and function: F05 may review fellowship applications on nuclear organization and function, including transcriptional regulation, chromatin structure, RNA processing, and nuclear import and export; F08 may review fellowship applications on molecular aspects of gene expression/regulation, chromosome structure and function, meiosis, and mitosis, in prokaryotes and in eukaryotes.

With F09 regarding the regulation of cell growth, cell division, and gene expression: F05 may review applications when the emphasis is on basic, normal cellular, molecular and developmental biology, including cell cycle, signal transduction, gene regulation, cell motility and differentiation; F09 may review such applications when the emphasis is to understand malignant processes.

With F10: F05 may review applications that utilize stem or differentiated cells to elucidate fundamental aspects of cell structure, function and regulation; F10 may review applications that concern the structure and function of differentiated cells in a tissue, organ, or pathology context.

## **F06 Fellowship Study Section Endocrinology, Nutritional Metabolism, and Reproductive Sciences**

### **[Endocrinology, Metabolism, Nutrition, and Reproductive Sciences (EMNR) Integrated Review Group]**

F06 reviews fellowship applications involved in areas of endocrinology, metabolism, nutrition, and 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. Examples of specific areas covered are listed below.

- Hormones and endocrine glands associated with the reproductive processes
- Physiological, pathophysiological, and molecular processes involving hypothalamic, pituitary, pineal, thyroid, adrenal, gonadal, and pancreatic hormones
- 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
- Evaluation of nutritional status throughout the life cycle
- Nutrient and energy metabolism
- Metabolic and molecular functions in Type II diabetes
- Adipocyte function, including nutrient storage and release, and communication with other organs and tissues
- Mechanisms, pathogenesis, and treatment of obesity and Type II diabetes
- Differentiation, development, growth, and function of pancreatic islets

Shared interests:

With F05: Applications that focus on signal transduction at the cellular and molecular level in context of cell division, cell cycle, cell senescence and death could be assigned to F05. All processes that address hormone effects in the context of gonadal development through implantation of the embryo, as well as aspects of all stages of pregnancy, parturition, neonatal development and maternal/fetal physiology could be assigned to F06. Applications that focus on stem cell transformation and differentiation are of interest to both panels and should be assigned based on the thrust of the application with F05 more concerned with the basic process of cellular differentiation and F06 more concerned with the endocrinology of the stem cell line.

With F07 regarding diabetes: Applications on non-immune diabetes may be assigned to F06; applications on autoimmune diabetes may be assigned to F07.

With F09: Applications that focus on the role of hormones in the development of cancer could be assigned to F06; applications that focus on carcinogenesis, tumor development and treatment, and metastasis could be assigned to F09.

With F10: Shared interests exist in the areas of exercise physiology, renal pathophysiology, and lipoprotein metabolism. Exercise physiology in the

context of skeletal muscle functions related to insulin action, insulin resistance and type 2 diabetes may be assigned to F06; exercise physiology in the context of respiratory function and regulation may be assigned to F10. Studies that focus on effects of nutrient metabolism in diabetic nephropathy and other diabetes-induced metabolic abnormalities may be assigned to F06; studies that focus on the underlying pathophysiology of the process of renal derangement and of muscle physiology addressing the role of actin and myosin and other factors in muscle contractility may be assigned to F10. In addition, F10 may be assigned applications on renal transport mechanisms intrinsic to diabetic nephropathy, diabetes-induced renal pathology, diabetes-induced urology pathology, and organ or environmental toxicology. Studies that focus on the lipoprotein risk factors or the nutrient/metabolic fate of substances in the context of type 2 diabetes and obesity may be assigned to F06; studies that focus on lipoprotein metabolism in the context of coronary artery diseases, vessel wall biology, and pathogenesis of atherosclerosis may be assigned to F10.

## **F07 Fellowship Study Section Immunological Sciences [Immunological Sciences (IMM) Integrated Review Group]**

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. Examples of specific areas covered are listed below.

- Mechanisms, prevention, and treatment of diseases when the immune system has a major role
- Evolution, comparative biology, development, structure, aging, and malfunction of the immune system
- Molecular, cell, organ, and organismal biology of the immune system
- Biophysical and structural analysis of antigens and immune system products and components
- Interaction of the immune system with other organs, such as the nervous and endocrine systems
- Participation in immunity by non-lymphohematopoietic tissues and cells, such as epithelia

Shared interests:

With F02A: If the primary focus is on neuroimmunology, assignment may be to F02A; if the primary focus is on immunology, assignment may be to F07.

With F05: If an application focuses on processes of the immune system, which are of a general nature also seen in other cell types, it may be assigned to F05; if an application focuses directly on processes of the immune system, it may be assigned to F07. For example, if T-cells are being used as a tool to study the general phenomenon of apoptosis, assignment may be to F05; apoptosis in T-cells studied within the context of an immune interaction to a non-self agent may be assigned to F07.

With F06 regarding diabetes: Applications on non-immune diabetes may be assigned to F06; applications on autoimmune diabetes may be assigned to

F07.

With F08 regarding immune responses to infectious agents: Applications focusing on the biology of the immune response to the pathogen may be assigned to F07; applications focusing on genetic or pathogenic aspects may be assigned to F08.

With F09: If the focus is on basic aspects of tumor immunology or on pre-clinical aspects of tumor vaccine development, particularly if it involves animal models only, then assignment may be to F07; if the research is focused on clinical or translational aspects of tumor immunology, or on the clinical or translational aspects of cancer vaccines, then assignment may be to F09.

With F10: Applications that have a considerable immune component, are related to broader issues in autoimmune disease etiology or transplant immunology, or that have a significant immunobiology component may be considered for review in F07; applications that emphasize effects on target tissue physiology may be considered for review in F10.

**F08 Fellowship Study Section**  
**Genetics, Microbiology, and Infectious Diseases**  
**[Genetic Sciences (GNS) Integrated Review Group]**  
**Parent IRG: GNS - Genetic Sciences**

F08 reviews fellowship applications in prokaryotic and eukaryotic genetics and molecular biology. This involves several overlapping scientific disciplines employing a large variety of prokaryotic and eukaryotic biological systems (e.g., animals, bacteria, fungi, parasites, plants, viruses, etc), particularly at the molecular level. Examples of specific areas covered are listed below.

- Chromosome structure and function
- Complex genetic traits and diseases
- DNA replication, recombination, and repair (including meiosis, mitosis, telomeres, transposable elements)
- Gene expression and regulation
- Genetics (including prokaryotic and eukaryotic)
- Genomics
- Population genetics and evolution
- Statistical genetics
- Infectious diseases and host cell responses
- Microbiology and parasitology

Shared interests:

With F04B: Applications focused on enzymological or structural aspects of nucleic acids and nucleic acid protein interactions may be assigned to F04B; applications focused on mechanisms of DNA replication/repair and gene expression/regulation may be assigned to F08. However, a biophysical study of DNA or RNA may be assigned to F04B, not F08.

With F05 regarding DNA replication and repair and telomere structure and function: F05 may review fellowship applications on nuclear organization and function, including transcriptional regulation, chromatin structure, RNA processing, and nuclear import and export; F08 may review fellowship

applications on molecular aspects of gene expression/regulation, chromosome structure and function, meiosis, and mitosis, in prokaryotes and in eukaryotes.

With F07 regarding immune responses to infectious agents: Applications focusing on the biology of the immune response to the pathogen may be assigned to F07; applications focusing on genetic or pathogenic aspects may be assigned to F08.

With F09: Applications focused on non-oncological aspects of DNA repair, gene expression/regulation, genetics, genomics, and virology may be assigned to F08; applications focused on oncological aspects of DNA repair, gene expression/regulation, genetics, genomics, and virology may be assigned to F09.

With F10: Applications with a focus on basic prokaryotic and eukaryotic genetics and molecular biology may be appropriate for F08; applications with a focus on physiology or pathophysiology that utilize genetic and molecular biological approaches may be appropriate for F10.

## **F09 Fellowship Study Section Oncological Sciences [Oncological Sciences (ONC) Integrated Review Group]**

F09 reviews fellowship applications in basic, translational, and clinical areas of cancer initiation, promotion, progression, diagnosis, treatment and prevention. Specifically, applications reviewed include chemical carcinogenesis, cancer genetics, nutritional carcinogenesis, radiation biology, tumor immunology, cancer therapeutic agents/treatment modalities, cancer biomarkers/signatures, chemoprevention, and translational research from bench to bedside. Examples of specific areas covered are listed below.

- Cancer prevention
- Cancer diagnosis
- Cancer genomics
- Cancer metastasis and angiogenesis
- Regulation of gene expression related to cancer
- Cancer-related DNA repair
- Transformation of cells by viruses
- Cancer biomarkers/signatures
- Cancer therapeutic agents
- Gene therapy for cancer
- Cancer immunology including cancer vaccines
- Delivery systems and animal models related to cancer

Shared interests:

With F04: Applications that are concerned with developing and synthesizing new and different compounds or with the physical chemistry and structure of proteins, lipids, and other biopolymers may be assigned to F04A or B; applications that are concerned with studying the efficacy and safety of anticancer compounds or the properties of cancer specific proteins, lipids, and

related compounds may be assigned to F09.

With F05 regarding the regulation of cell growth, cell division, and gene expression: F05 may review applications when the emphasis is on basic, normal cellular, molecular and developmental biology, including cell cycle, signal transduction, gene regulation, cell motility and differentiation; F09 may review such applications when the emphasis is to understand malignant processes.

With F07: If the focus is on basic aspects of tumor immunology or on pre-clinical aspects of tumor vaccine development, particularly if it involves animal models only, then application assignment may be to F07; if the research is focused on clinical or translational aspects of tumor immunology, or on the clinical or translational aspects of cancer vaccines, then assignment may be to F09.

With F10: Applications relevant to the role of angiogenesis in cancer pathobiology may be assigned to F09; applications relevant to other aspects of angiogenesis may be assigned to F10.

## **F10 Fellowship Study Section Physiology and Pathobiology of Organ Systems [Digestive Sciences (DIG) Integrated Review Group]**

F10 reviews fellowship applications for basic and clinical aspects of respiratory, digestive, renal and cardiovascular systems (including hematology); musculoskeletal, oral, and skin sciences; and surgery, radiobiology and bioengineering. 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. Examples of specific areas covered are listed below.

- Organ system physiology and pathobiology
- Experimental models of diseases
- Animal and clinical studies, including exercise physiology
- Toxicology related to digestive, respiratory, cardiovascular, musculoskeletal and renal systems
- Neural control of circulation
- Angiogenesis and hemostasis (platelets and coagulation)
- Hematopoiesis, myelopoiesis, and leukemogenesis
- Trauma and sepsis

Shared interests:

With F02A: Applications concerning neurotoxicology may be appropriate for F02A; applications concerning toxicology of the renal, digestive systems, respiratory, or cardiovascular systems may be appropriate for F10.

With F05: F05 may review applications that utilize stem or differentiated cells to elucidate fundamental aspects of cell structure, function and regulation;

F10 may review applications that concern the structure and function of differentiated cells in a tissue, organ, or pathology context.

With F06: Shared interests exist in the areas of exercise physiology, renal pathophysiology, and lipoprotein metabolism. Exercise physiology in the context of skeletal muscle functions related to insulin action, insulin resistance and type 2 diabetes may be assigned to F06; exercise physiology in the context of respiratory function and regulation may be assigned to F10. Studies that focus on effects of nutrient metabolism in diabetic nephropathy and other diabetes-induced metabolic abnormalities may be assigned to F06; studies that focus on the underlying pathophysiology of the process of renal derangement and of muscle physiology addressing the role of actin and myosin and other factors in muscle contractility may be assigned to F10. In addition, F10 may be assigned applications on renal transport mechanisms intrinsic to diabetic nephropathy, diabetes-induced renal pathology, diabetes-induced urology pathology, and organ or environmental toxicology. Studies that focus on the lipoprotein risk factors or the nutrient/metabolic fate of substances in the context of type 2 diabetes and obesity may be assigned to F06; studies that focus on lipoprotein metabolism in the context of coronary artery diseases, vessel wall biology, and pathogenesis of atherosclerosis may be assigned to F10.

With F07: Applications that have a considerable immune component, are related to broader issues in autoimmune disease etiology or transplant immunology, or that have a significant immunobiology component may be considered for review in F07; applications that emphasize effects on target tissue physiology may be considered for review in F10.

With F08: Applications with a focus on basic prokaryotic and eukaryotic genetics and molecular biology may be appropriate for F08; applications with a focus on physiology or pathophysiology that utilize genetic and molecular biological approaches may be appropriate for F10.

With F09: Applications relevant to the role of angiogenesis in cancer pathobiology may be assigned to F09; applications relevant to other aspects of angiogenesis may be assigned to F10.

With HOP: Applications involving human subjects where the emphasis is on physiology or pathophysiology may be appropriate for F10; applications involving human subjects where the emphasis is on epidemiology or behavioral studies may be appropriate for HOP.

## **F11 Fellowship Study Section Risk, Prevention and Health Behavior (RPHB) Integrated Review Group**

### **F11 Psychosocial and Developmental Processes, Personality, and Behavior**

The F11 study section reviews fellowship applications in the areas of social, developmental, and personality psychology as well as the areas of medical sociology and anthropology. 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. Examples of specific topics covered are listed below.

- Aggressive behavior and violence
- Attitudes and behavior
- Emotion regulation
- Individual differences in personality
- Marital and family interventions
- Psychological stress and coping behavior
- Self and social identity
- Social support and illness management

Shared Interests:

With F12B: Fellowship applications that emphasize the biological or physical bases of social, psychological or cultural conditions and processes may be assigned to F12B. Applications that emphasize the social, psychological or cultural conditions and processes with little or no attention to their biological or physical bases may be assigned to RPHB.

With the Risk, Prevention and Health Behavior (RPHB) IRG: Fellowship applications that are concerned with basic social, psychological, or cultural conditions and processes may be assigned to the F11 study section. Applications that are concerned with these conditions and processes as components of behavioral or biobehavioral interventions to reduce or avoid risk of specific diseases or disorders or to treat, manage, or rehabilitate persons with specific diseases or disorders may be assigned to be reviewed in the BMIO or PRDP (behavioral medicine) study sections.

With the Health of the Population (HOP) IRG: Fellowship applications that emphasize the demographic, community, or epidemiological contexts of social, psychological or cultural conditions and processes may be assigned to the HOP IRG. Applications that emphasize the individual or interpersonal bases of social, psychological or cultural conditions and processes with little or no attention to their demographic, community, or epidemiological contexts may be assigned to RPHB.

## **F12 Fellowship Study Sections [Biobehavioral and Behavioral Processes (BBBP) Integrated Review Group]**

**F12A      Cognition, Language and Perception**

The F12A study section reviews fellowship 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. Also considered by the F12A fellowship study section are applications investigating cognition and perception and their development across the lifespan. Normal and disordered forms of cognition and perception are considered.

- Language development and origins of language/communication disorders
- Language comprehension and production
- Non-linguistic communication
- Brain-regions underlying language/communication abilities
- Perceptual and cognitive processes underlying reading and writing abilities
- Perceptual mechanisms for all sensory modalities
- Reasoning, decision-making, and problem-solving
- Intelligence and aptitudes
- Cognitive/perceptual mechanisms underlying behavioral and mental disorders
- Acquisition of knowledge and skills
- Planning and monitoring of actions
- Executive function

Shared interests:

With F01: Applications focusing on neural mechanisms underlying language, cognition and/or perception that have a primary focus on behavioral endpoints may be assigned to F12A. Studies of the neural basis of disorders that impair language, cognition and/or perception may be assigned to F01.

With F02B: Applications primarily on behavioral science may be assigned to F12A. Applications on sensory or cognitive neuroscience at an integrative level may be assigned to F02B.

With F12B: Studies of symptoms, disorders, and interventions specifically related to language or cognitive/perceptual mechanisms may be assigned to F12A. Studies that consider a broader range of behavioral disorders in adults/children may be assigned to F12B.

With the Risk, Prevention and Health Behavior (RPHB) IRG: Studies that emphasize the biological or physical bases of cognition may be assigned to F12A. Studies of interventions that focus on the cognitive aspects of personality and social interaction with little or no attention to their biological or physical bases may be assigned to the RPHB IRG.

With the Biobehavioral and Behavioral Processes (BBBP) IRG: (1) Studies of animal cognition/communication may generally be assigned to BBBP. Animal work that is strongly connected to research on human language and cognition may be assigned to F12A. (2) Studies of motor processes underlying sound production and gesture may be assigned to BBBP. Studies that consider their linguistic or communicative significance may be assigned to F12A.

## **F12B Psychopathology, Developmental Disabilities, Stress and Aging**

The F12B study section reviews fellowship applications concerned with emotional, behavioral, and developmental disorders across the lifespan. Also included are substance use disorders, as well as their effects on children when they occur prenatally. Emphasis is on psychopathology 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 for review in the F12B study section are fellowship applications on basic biobehavioral, psychological, social and cultural processes governing affect (emotion, mood) and stress in animals and humans. Examples of specific areas covered are listed below.

- Psychological and biological factors involved in etiology of disorders
- Diagnosis and nosology of disorders
- Course and outcome of disorders
- Behavioral and pharmacologic interventions
- Disorders of cognitive, sensory, perceptual and motor development: Included are disorders such as mental retardation, autism, attention deficit and learning disabilities
- Congenital and acquired disorders that affect brain development and behavior: Included are Williams syndrome, Down syndrome, traumatic brain injury and CNS tumors/lesions
- Prenatal exposure to substance abuse and prenatal/postnatal effects of toxins
- Affect and stress processes in central and autonomic nervous system, neuroendocrine and immune function
- Psychophysiological responses to stress
- Functional consequences of affect and stress

Shared interests:

With F01: Studies of adult disorders that are primarily behavioral in emphasis may be assigned to F12B. Studies that focus predominantly on neurotransmitter and receptor function in the neural disorder or injury may be assigned to the F01 fellowship study section.

With F02A: Studies in which the primary research focus is behavioral may go to F12B. Studies where the primary focus is on neurobiology including psychoneuroendocrinology and psychoneuroimmunology may be assigned to F02A.

With F12A: Studies of symptoms, disorders, and interventions specifically related to language or cognitive/perceptual mechanisms may be assigned to F12A. Studies that consider a broader range of abnormality in adults/children may be assigned to F12B. Studies of the influence of affect and stress on cognitive and perceptual mechanisms may be assigned to F12A. Studies of the influence of cognition and perception on affective and stress responses

may be assigned to F12B.

With the Health of the Population (HOP) IRG: Studies that focus on the individual level of analysis in adult disorders and disability may be reviewed in F12B. Studies in which the focus is on social or environmental levels of analysis or epidemiological studies of risk and protective factors may be assigned to the HOP IRG.

With the Risk Prevention and Health Behavior (RPHB) IRG: Studies that emphasize the biological or physical bases of social, psychological or cultural conditions and processes may be assigned to F12B. Studies that are concerned with basic social, psychological, or cultural conditions and processes with little or no attention to their biological or physical bases may be assigned to the RPHB IRG. Studies that are concerned with these conditions and processes as components of behavioral or biobehavioral interventions to reduce or avoid risk of specific diseases or disorders or to treat, manage, or rehabilitate persons with specific diseases or disorders may also be assigned to the RPHB IRG.

With the Biobehavioral and Behavioral Processes (BBBP) IRG: Studies of the role of affect and stress in animal behavior and adaptation may be assigned to BRLE. Studies of the basic mechanisms underlying affect and stress responses in animals, especially when directly relevant to human mechanisms may be assigned to F12B.

## **Fellowship Application Review by Regular Study Sections**

### **AIDS and Related Research (AARR)**

The AARR IRG reviews fellowship applications in its regular study sections. These applications are clustered as much as possible and separated appropriately by science, e.g., one cluster is AIDS and behavioral sciences.

### **Behavioral and Biobehavioral Processes (BBBP)**

In the BBBP IRG, fellowship applications were recently assigned to dedicated fellowship study sections. These are divided into two groups: (1) applications in the areas of language and cognition from the LCOM and CP study sections and (2) applications in the areas in adult/child psychopathology from the APDA and CPDD study sections and applications in psychoneuroendocrinology from MESH. A small number of applications related to basic biobehavioral processes and motor/speech function are reviewed in regular study sections (BRLE and MFSR, respectively).

### **Health of the Population (HOP)**

The Health of the Population (HOP) IRG reviews applications for research on

the broader socioenvironmental contexts in which health and health-related behavior are embedded and in which the interaction of these socioenvironmental factors with the health and health-related behavior of individuals and populations is examined. 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.

### **Risk, Prevention, and Health Behaviors (RPHB)**

The RPHB fellowship applications are divided into two groups. The first consists of a relatively large number of applications in the areas of social, personality, developmental psychology, and risk. These are reviewed in a dedicated fellowship study section. The second group includes a small number of behavioral medicine applications that are reviewed in regular study sections (BMIO and PRDP), separated according to the study section guidelines.