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Scientific Areas of Integrated Review Groups (IRGs)

For a listing of the Scientific Review Officer and membership roster for each study section, click on the study section roster under the study section name within an IRG listed below or go to the [study section index](#) (study sections listed alphabetically) and click on the specified roster next to the name of the study section.

Genes, Genomes and Genetics IRG [GGG]

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- [Prokaryotic Cell and Molecular Biology Study Section \[PCMB\]](#)
- [Molecular Genetics A Study Section \[MGA\]](#)
- [Molecular Genetics B Study Section \[MGB\]](#)
- [Molecular Genetics C Study Section \[MGC\]](#)
- [Genomics, Computational Biology and Technology Study Section \[GCAT\]](#)
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- [Therapeutic Approaches to Genetic Diseases Study Section \[TAG\]](#)
- [Gene Therapy and Inborn Errors \[GTIE\] Special Emphasis Panel](#)
- [Ethical, Legal, and Social Implications of Human Genetics Special Emphasis Panel \[ELS\]](#)

Prokaryotic Cell and Molecular Biology Study Section [PCMB]

[\[PCMB Membership Roster\]](#) [\[PCMB Meeting Rosters\]](#)

The Prokaryotic Cell and Molecular Biology [PCMB] Study Section reviews applications addressing the genetics, biochemistry, structure, physiology and behavior of bacteria, archaea, and their phages. The focus of the study 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. Specific areas covered by PCMB:

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

Study sections with most closely related areas of similar science listed in rank order are:

[Bacterial Pathogenesis \[BACP\]](#)

[Drug Discovery and Mechanisms of Antimicrobial Resistance \[DDR\]](#)

[Host Interactions with Bacterial Pathogens \[HIBP\]](#)

[Macromolecular Structure and Function A \[MSFA\]](#)

[Macromolecular Structure and Function B \[MSFB\]](#)

[Macromolecular Structure and Function C \[MSFC\]](#)

[Macromolecular Structure and Function D \[MSFD\]](#)

[Macromolecular Structure and Function E \[MSFE\]](#)

[Molecular Genetics A \[MGA\]](#)

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Molecular Genetics A Study Section [MGA]

[\[MGA Membership Roster\]](#) [\[MGA Meeting Rosters\]](#)

The molecular genetics [MGA, MGB, and MGC] study 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. Specific areas covered by all MG study sections followed by an additional area of emphasis for MGA:

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

MGA has an area of additional emphasis:

- Enzymology: ribosome, RNA and DNA polymerase structure function, helicases, tRNA aminoacylation, RNA and DNA protein physical interactions, ribozymes.

Study sections with most closely related areas of similar science listed in rank order are:

[Molecular Genetics B \[MGB\]](#)

Molecular Genetics B Study Section [MGB]

[\[MGB Membership Roster\]](#) [\[MGB Meeting Rosters\]](#)

The molecular genetics [MGA, MGB, and MGC] study 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. Specific areas covered by all MG study sections are listed below, followed by a list of additional areas of emphasis for MGB:

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

MGB has areas of additional emphasis:

- Epigenetic processes: imprinting, transvection, paramutation, X inactivation, dosage compensation
- Gene expression mechanisms in plants

Study sections with most closely related areas of similar science listed in rank order are:

[Molecular Genetics A \[MGA\]](#)

[Molecular Genetics C \[MGC\]](#)

[Genomics Computational Biology and Technology \[GCAT\]](#)

[Development 2 \[DEV2\]](#)

Molecular Genetics C Study Section [MGC]

[\[MGC Membership Roster\]](#) [\[MGC Meeting Rosters\]](#)

The molecular genetics [MGA, MGB, and MGC] study 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. Specific areas covered by all MG study sections are listed below, followed by a list of additional areas of emphasis for MGC:

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

MGC has areas of additional emphasis:

- Chromosome functions: meiosis, mitosis, telomere biology, aneuploidy, repeat expansions
- Human DNA repair and recombination pathways

Study sections with most closely related areas of similar science listed in rank order are:

[Molecular Genetics A \[MGA\]](#)

[Molecular Genetics B \[MGB\]](#)

[Cancer Etiology \[CE\]](#)

[Development □ 2 \[DEV2\]](#)

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Genomics, Computational Biology and Technology Study Section [GCAT]

[\[GCAT Membership Roster\]](#) [\[GCAT Meeting Rosters\]](#)

The Genomics, Computational Biology and Technology [GCAT] Study 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. Specific areas covered by GCAT:

- Generation, analysis, and mining of large data sets: genetic, epigenetic, biochemical, gene expression, metabolic, proteomic, microarrays, genome sequencing, comparative genomics.
- 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.
- Development and application of emerging genomic and epigenomic technologies to cellular, metabolic or disease pathways.
- 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.
- Development of new statistical genetic methods and computational algorithms and software.

Study sections with most closely related areas of similar science listed in rank order are:

[Genetics of Health and Disease \[GHD\]](#)

[Genetic Variation and Evolution \[GVE\]](#)

[Biodata Management and Analysis \[BDMA\]](#)

[Molecular Genetics B \[MGB\]](#)

[Biostatistical Methods and Research Design \[BMRD\]](#)

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Genetic Variation and Evolution Study Section [GVE]

[\[GVE Membership Roster\]](#) [\[GVE Meeting Rosters\]](#)

The Genetic Variation and Evolution [GVE] Study 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. Specific areas covered by GVE:

- 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.
- Mechanisms of evolution: selection, adaptation, mutation, recombination, gene/genome duplication, transposition, chromosomal evolution, and speciation;
- Genotype to 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;
- Population genetics: theory, experimental approaches, and application to large genomic datasets;
- Molecular evolution from genes to genomes: phylogenetics, comparative genomics, bioinformatics, computational biology, modeling, and systems biology.

Study sections covering related areas of science listed in rank order are:

[Genomics Computational Biology and Technology \[GCAT\]](#)

[Genetics of Health and Disease \[GHD\]](#)

[Pathogenic Eukaryotes \[PTHE\]](#)

[Host Interactions with Bacterial Pathogenesis \[HIBP\]](#)

[Virology A \[VIRA\]](#)

[Virology B \[VIRB\]](#)

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Genetics of Health and Disease Study Section [GHD]

[\[GHD Membership Roster\]](#) [\[GHD Meeting Rosters\]](#)

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

- 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.
- 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.
- 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.
- Cytogenetics and disease: Chromosomal and genomic disorders, aneuploidy, translocations, mosaicism, chimerism, dosage effects.

Study sections with most closely related areas of similar science listed in rank order are:

[Genomics, Computational Biology and Technology \[GCAT\]](#)

[Gene Therapy and Inborn Errors \[GTIE\]](#)

[Genetic Variation and Evolution \[GVE\]](#)

[Behavioral Genetics and Epidemiology \[BGES\]](#)

[Epidemiology of Cancer \[EPIC\]](#)

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Therapeutic Approaches to Genetic Diseases Study Section [TAG]

[\[TAG Membership Roster\]](#) [\[TAG Meeting Rosters\]](#)

TAG study section covers mechanisms by which genomic abnormalities that cause genetic disease lead to disease pathogenesis. Further, the study section covers development of therapeutics for genetic diseases. Specific areas are:

- 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.
- 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.
- Development of resources for mechanisms and therapies of genetic diseases: stem cells, nucleic acid transfer vectors, and animal models of human diseases.
- Preclinical and initial clinical studies of genetic disease therapies

Study sections with most closely related areas of similar science listed in rank order are:

[Genetics of Health and Disease \[GHD\]](#)
[Gene and Drug Delivery \[GDD\]](#)
[Molecular Neurogenetics \[MNG\]](#)

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Gene Therapy and Inborn Errors [GTIE] Special Emphasis Panel

(This is a recurring Special Emphasis Panel.)

[\[GTIE Roster\]](#)

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.

Specific areas covered by GTIE:

- Development of gene therapy approaches for metabolic diseases, including lysosomal, peroxisomal and mitochondrial storage diseases, affecting multiple organs
- Molecular genetics of viral and non-viral vectors within target cells and tissues:
- Studies of transduction, integration, replication and repair, gene expression and gene silencing mechanisms in animal and human tissues and in animal models of diseases
- 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
- Development of in vitro and animal models of disease for gene therapy investigation

GTIE has the following shared interests within the GGG IRG:

- **With Genetics of Health and Disease:** GTIE and GHD both review applications dealing with the genetic basis of inborn errors of metabolism. If the application is focused on gene identification, assignment could be to GHD. If the focus is to understand molecular phenotypic effects of genetic

alterations or developing gene therapy approaches for the disorder, assignment could go to GTIE.

- **With Molecular Genetics A, B, & C:** MG study sections and GTIE review applications dealing with DNA replication repair, recombination and gene expression and silencing. Applications with a basic science context may be assigned to the MG study sections; applications with a disease or gene therapy context may be assigned to GTIE.

GTIE has the following shared interests outside the GGG IRG:

- **With the Endocrinology, Metabolism, Nutrition & Reproductive Sciences [EMNR], Musculoskeletal, Oral, & Skin Sciences [MOSS], AIDS & Related Research [AARR], Oncological Sciences [ONC], Immunology [IMM], Infectious Diseases & Microbiology [IDM], Cardiovascular Sciences [CVS], Digestive Sciences [DIG], Hematology [HEME], Respiratory Sciences [RES], and Renal & Urological Sciences [RUS] IRGs** with respect to gene therapy of metabolic diseases. If the application concerns a particular disease or organ system, assignment could be to the disease/organ IRG. If the application concerns issues of broad interest to the field of gene therapy, multiple organs or an emerging approach, assignment could be to GTIE.
- **With the Neuroscience IRGs - Brain Disorders & Clinical Neuroscience [BDCN], Integrative, Functional, & Cognitive Neuroscience [IFCN], and Molecular, Cellular, & Developmental Neuroscience [MDCN]** in the study of metabolic disorders that affect the function of the nervous system. If neuropathology is the main focus, the application could be assigned to BDCN, IFCN, or MDCN, if a metabolic defect, issues of broad interest to the field of gene therapy, or an emerging genetic approach is the main focus, then assignment could be to GTIE.
- **With the Bioengineering Sciences & Technologies [BST] IRG** with respect to gene and drug delivery systems. If the focus is on bioengineering, development, design, or validation of drug delivery systems, the assignment could be to BST. If the focus is on gene therapy, the assignment could be to GTIE.

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Ethical, Legal, and Social Implications of Human Genetics Special Emphasis Panel [ELS]

[\[ELS Membership Roster\]](#) [\[ELS Meeting Rosters\]](#)

The Ethical, Legal, and Social Implications of Human Genetics [ELS] Special Emphasis Panel reviews ethical, legal, and social implications of human genetics. Specific areas are:

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

Study sections with most closely related areas of similar science listed in rank order are:

[Psychosocial Risk and Disease Prevention \[PRDP\]](#)

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