



Center for
Scientific Review

ENQUIRE Cluster 8: Developmental and Regenerative Biology

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ENQUIRE – What is Enquire?

- ENQUIRE is a multi-stage process that examines the fit of CSR study sections to the current scientific landscape then makes changes to the total number of study sections, topic areas, boundaries, overlap, and scope to match current needs of the scientific community
- Enquire Stage 1: External Scientific Panel
 - How well does the scientific scope of the study sections align with the current state of the science?
 - Recommend a set of newly-defined study sections of appropriate size (70-80 apps/round), to optimally cover the topics, add emerging areas, remove topics that are not relevant
- Enquire Stage 2: NIH Internal Panel
 - Will the recommended study section function support optimal identification of high-impact science?
 - Recommend changes in meeting administration to optimize quality of review process, external scientific panel report
- Later Stages: CSR Advisory Council approval, CSR staff input on implementation, mock sorts, CSR finalizes guidelines, develop overlap statements, launch new study sections

ENQUIRE – Why is it necessary?

- Science evolves. The scope of study sections might need to shift to accommodate emerging areas of science.
- Numbers. The scope of study sections might need to shift to maintain reasonable application numbers in each study section. Workload data are analyzed.
- Develop a new set of study sections that will promote fair, competitive, expert review. Each study section should have coherent topic areas but should be broad enough to avoid insular, boutique review panels

Cluster 8 External Workgroup Roster

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DELANY, ANNE M, PHD

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JANG, YOUNG CHARLES, PHD

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LAWSON, NATHAN D, PHD

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TALLQUIST, MICHELLE D, PHD

UNIVERSITY OF HAWAII

WANG, JIANBO, PHD

UNIVERSITY OF ALABAMA AT
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WESSEL, GARY M, PHD

BROWN UNIVERSITY

CSRAC Member Observer

Michelle Janelins-Benton, PHD

University of Rochester Medical
Center

ENQUIRE Cluster 8 External Panel Objectives

- Develop and implement an appropriate set of study sections, each with about 70-80 applications per round, that will cover the topic space represented in the Developmental and Regenerative Biology Cluster
- For this cluster application numbers would support 7-8 panels.
- There should be some level of overlap between the new panels so that more than one review committee with relevant expertise would be available to applicants for their applications

Enquire Cluster 8: Existing Developmental and Regenerative Biology Study Sections

	Study Section	Avg Apps per Round
SBDD	Skeletal Biology Development and Disease	92
SBSR	Skeletal Biology Structure and Regeneration	91
MTE	Musculoskeletal Tissue Engineering	73
SMEP	Skeletal Muscle and Exercise Physiology	82
DEV1	Development - 1	42
DEV2	Development - 2	68
CDD	Cardiovascular Differentiation and Development	39
NCF	Neurogenesis and Cell Fate	45
NDPR	Neurodifferentiation, Plasticity, Regeneration and Rhythmicity	58
CMIR	Cellular, Molecular and Integrative Reproduction	54
ICER	Integrative and Clinical Endocrinology and Reproduction ***	

***Only a subset of ICER applications/topic areas are related to Enquire Cluster 8

Enquire Cluster 8: Topics from additional Study Included at Request of External Workgroup

- BBHV Basic Biology of Blood, Heart and Vasculature
- BDE Biology and Development of the Eye
- HBPP Hepatobiliary Pathophysiology
- KUFD The Kidney and Urological Systems Function and Dysfunction
- LIRR Lung Injury, Repair, and Remodeling

Organizing Framework and Workgroup Observations

- The workgroup decided there was a need to have both general panels and some system specific panels
- There should be more than one basic development study section so applications involving fundamental molecular and cellular mechanisms can be pulled from current study sections and combined.
- An emerging trend in the field is to expand the number of model systems. Study sections need to support a breadth of diverse models to facilitate important comparisons across species.
- There has been substantial growth in the community in the related areas of stem cells and regeneration and these topics are not well covered by current panels
- Ex vivo organoid and organ-on-a-chip studies are also an expanding area being used in studies of developmental processes and need to be incorporated into the new panels.
- Metabolism and the role of mitochondria in developmental biology is a growing area and lacks a specific home in the current study sections.
- Current study sections for the musculoskeletal system are well-subscribed and are generally functioning well however SBDD is too broad, and exercise physiology includes more than skeletal muscle (SMEP)
- Cardiac muscle requires a distinct home from skeletal muscle since these are very different tissues and to allow room for disease-related applications.

External Workgroup Outcomes

- Main topics were collected to create a set of eight study sections that included organ specific, basic development, and regeneration-based study sections.
- Two of the original panels remained unchanged:
 - Skeletal Muscle and Exercise Physiology
 - Musculoskeletal Tissue Engineering
- Six newly proposed study sections recommended that reflect substantial reorganization in the topic areas of developmental biology, regeneration and repair, or organs and organ systems.
 - Skeletal Development and Regeneration
 - Skeletal Structure Physiology and Disease
 - Nervous System Development and Repair
 - Cell Fate, Stem Cells and Regeneration
 - Tissue Morphogenesis and Organogenesis
 - Gametogenesis and Development of Reproductive Systems

Enquire Cluster 8 Proposed Study Sections

Musculoskeletal

Skeletal Development and Regeneration Study Section

Skeletal Structure Physiology and Disease Study Section

Skeletal Muscle and Exercise Physiology Study Section

Musculoskeletal Tissue Engineering Study Section

System Specific Developmental Bio

Nervous System Development and Repair Study Section

Gametogenesis and Development of Reproductive Systems Study Section

Basic Developmental Bio

Cell Fate, Stem Cells and Regeneration Study Section

Tissue Morphogenesis and Organogenesis Study Section

Musculoskeletal Group (1 of 2)

Skeletal Development and Regeneration (SDR) - NEW

The Skeletal Development and Regeneration [SDR] study section reviews grant applications dealing with foundational, translational, and clinical aspects of normal and abnormal skeletal development, regeneration, and repair. This includes applications focused on axial, appendicular, and craniofacial skeletal biology.

Skeletal Structure Physiology and Disease (SSPD) - NEW

The Skeletal Structure Physiology and Disease [SSPD] study section reviews applications involving the normal physiology and pathobiology of the musculoskeletal system. This includes the foundational, translational, and clinical aspects of the skeletal response to loading, injury, aging, and disease.

Musculoskeletal Group (2 of 2)

Skeletal Muscle and Exercise Physiology (SMEP) - Unchanged

The Skeletal Muscle Biology and Exercise Physiology [SMEP] study 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.

Musculoskeletal Tissue Engineering (MTE) - Unchanged

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

System Specific Developmental Biology Group

Nervous System Development and Repair (NSDR) - NEW

The Nervous System Development and Repair (NSDR) study section reviews applications concerned with the patterning, differentiation, and wiring of nervous systems that lead to the formation of neural circuits. This includes studies on the regulation of transcription and translation, neurogenesis, epigenetics in the context of nervous system development, as well as neurite outgrowth, axon guidance, connectivity, synapse formation, plasticity, aging, and regeneration of neuronal connectivity. The emphasis is on fundamental cellular and molecular mechanisms during normal development and repair in response to disease, injury, aging and extrinsic factors. Approaches include the use of invertebrate or vertebrate models, as well as slice cultures, dissociated primary cell cultures, and cell lines.

Gametogenesis and Development of Reproductive Systems(GDRS) - NEW

Gametogenesis and Development of Reproductive Systems Study Section reviews applications concerned with the molecular, cellular, genomic, (reproductive) endocrine, development and physiological aspects of reproductive biology in mammalian and model organism systems. Emphasis is on an integrative experimental approach to elucidate basic mechanisms controlling fertility.

Basic Developmental Biology Group

Cell Fate, Stem Cells and Regeneration (CFSR) - NEW

The Cell Fate, Stem Cells, and Regeneration (CFSR) study section reviews applications covering topics in developmental and regeneration biology using diverse animal and *ex vivo* models, to understand the regulation of cellular specification and differentiation in embryogenesis and adulthood. Studies of stem cells, induced pluripotent stem cells, and adult stem cells and their capacity for reprogramming, regeneration or repair. Cell biological, biochemical, genetic, imaging and molecular approaches to address problems at the level of tissues, organs and the whole organism.

Tissue Morphogenesis and Organogenesis (TMO) - NEW

The Tissue Formation and Organogenesis study section focuses on cellular, molecular, and morphogenetic mechanisms that contribute to tissue and organ formation in the developing embryo. Studies of the cellular and molecular basis underlying the formation of germ-layers, gastrulation, organization of cells into tissues, cell-cell communication, adhesion, migration, impact of cellular and subcellular processes on development, force generation, and the developmental basis for birth defects. A major emphasis is on the cardiovascular, digestive, endocrine, lymphatic, respiratory, integumentary, and urogenital systems. Studies utilize varied experimental systems including both vertebrate and invertebrate organisms and *ex vivo* models.

Internal Panel

- **Joe Gindhart** – National Institute of Child Health and Development
- **Lyn Jakeman** – National Institute of Neurological Disorders and Stroke
- **Gayle Lester** – National Institute of Arthritis and Musculoskeletal and Skin Diseases
- **Aruna Behera** – Center for Scientific Review
- **John Bowers** – Center for Scientific Review
- **Ray Jacobson** – Center for Scientific Review
- **Seo Young Hong (ex officio)** – Center for Scientific Review

Internal Panel Recommendations

- Supportive of external panel recommendations – both guiding principles and recommended study sections
- Comments
 - Emphasized the need for clear overlap statements
 - New muscle/bone study sections could be large
 - As much as possible, cluster areas of science with low numbers of applications

CSR Recommendations for approval

Proposed Study Sections

- **Cell Fate, Stem Cells and Regeneration**
- **Tissue Formation and Organogenesis**
- **Nervous System Development and Repair**
- **Gametogenesis and Development of Reproductive Systems**
- **Skeletal Development and Regeneration**
- **Skeletal Structure Physiology and Disease**
- **Skeletal Muscle and Exercise Physiology**
- **Musculoskeletal Tissue Engineering**

Next Steps

- Fine tune names, descriptions, overlap statements
- Mock Sort/feasibility
- Delay implementation by a council round to avoid overlap with SRF
 - April 2025, guidelines published
 - June 2025, first receipt date
 - October 2025, first meetings for January 2026 council.

Discussion