



ANNEX A: LIFE SCIENCES

Primary Area: Molecules of Life: Biological Mechanisms, Structures and Functions

Disciplines: Molecular biology, biochemistry, structural biology, molecular biophysics, synthetic and chemical biology, drug design, innovative methods and modelling

Sub-disciplines including but not limited to:

- Macromolecular complexes including interactions involving nucleic acids, proteins, lipids and carbohydrates
- Biochemistry
- DNA and RNA biology
- Protein biology
- Lipid biology
- Glycobiology
- Molecular biophysics, biomechanics, bioenergetics
- Structural biology
- Molecular mechanisms of signalling processes
- Synthetic biology
- Chemical biology
- Protein design
- Early translational research and drug design
- Innovative methods and modelling in molecular, structural, and synthetic biology

Primary Area: Integrative Biology: from Genes and Genomes to Systems

Disciplines: Genetics, epigenetics, genomics and other 'omics studies, bioinformatics, systems biology, genetic diseases, gene editing, innovative methods and modelling, 'omics for personalised medicine

Sub-disciplines including but not limited to:

- Genetics
- Gene editing
- Epigenetics
- Gene regulation
- Genomics
- Metagenomics
- Transcriptomics
- Proteomics
- Metabolomics
- Glycomics/Lipidomics
- Bioinformatics and computational biology
- Biostatistics
- Systems biology
- Genetic diseases
- Integrative biology for personalised medicine
- Innovative methods and modelling in integrative biology



Primary Area: Cellular, Developmental and Regenerative Biology

Disciplines: Structure and function of the cell, cell-cell communication, embryogenesis, tissue differentiation, organogenesis, growth, development, evolution of development, organoids, stem cells, regeneration, therapeutic approaches

Sub-disciplines including but not limited to:

- Cell cycle, cell division and growth
- Cell senescence, cell death, autophagy, cell ageing
- Cell behaviour, including control of cell shape, cell migration
- Cell junctions, cell adhesion, the extracellular matrix, cell communication
- Cell signalling and signal transduction, exosome biology
- Organelle biology and trafficking
- Mechanobiology of cells, tissues and organs
- Embryogenesis, pattern formation, morphogenesis
- Cell differentiation, formation of tissues and organs
- Developmental genetics
- Evolution of developmental strategies
- Organoids
- Stem cells
- Regeneration
- Development of cell-based therapeutic approaches for tissue regeneration
- Functional imaging of cells and tissues
- Theoretical modelling in cellular, developmental and regenerative biology

Primary Area: Physiology in Health, Disease and Ageing

Disciplines: Organ and tissue physiology, comparative physiology, physiology of ageing, pathophysiology, interorgan and tissue communication, endocrinology, nutrition, metabolism, interaction with the microbiome, non-communicable diseases including cancer (and except disorders of the nervous system and immunity-related diseases)

Sub-disciplines including but not limited to:

- Organ and tissue physiology and pathophysiology
- Comparative physiology
- Physiology of ageing
- Endocrinology
- Non-hormonal mechanisms of inter-organ and tissue communication
- Microbiome and host physiology
- Nutrition and exercise physiology
- Impact of stress (including environmental stress) on physiology
- Metabolism and metabolic disorders, including diabetes and obesity
- The cardiovascular system and cardiovascular diseases
- Haematopoiesis and blood diseases
- Cancer
- Other non-communicable diseases (except disorders of the nervous system and immunity-related diseases)



Primary Area: Neuroscience and Disorders of the Nervous System

Disciplines: Nervous system development, homeostasis and ageing, nervous system function and dysfunction, systems neuroscience and modelling, biological basis of cognitive processes and of behaviour, neurological and mental disorders

Sub-disciplines including but not limited to:

- Neuronal cells
- Glial cells and neuronal-glial communication
- Neural development and related disorders
- Neural stem cells
- Neural networks and plasticity
- Neurovascular biology and blood-brain barrier
- Sensory systems, sensation and perception, including pain
- Neural basis of behaviour
- Neural basis of cognition
- Ageing of the nervous system
- Neurological and neurodegenerative disorders
- Mental disorders
- Nervous system injuries and trauma, stroke
- Repair and regeneration of the nervous system
- Neuroimmunology, neuroinflammation
- Systems and computational neuroscience
- Imaging in neuroscience
- Innovative methods and tools for neuroscience

Primary Area: Immunity, Infection and Immunotherapy

Discipline: The immune system, related disorders and their mechanisms, biology of infectious agents and infection, biological basis of prevention and treatment of infectious diseases, innovative immunological tools and approaches, including therapies

Sub-disciplines including but not limited to:

- Innate immunity
- Adaptive immunity
- Regulation of the immune response
- Immune-related diseases
- Biology of pathogens (e.g. bacteria, viruses, parasites, fungi)
- Infectious diseases
- Mechanisms of infection
- Biological basis of prevention and treatment of infection
- Antimicrobials, antimicrobial resistance
- Vaccine development
- Innovative immunological tools and approaches, including therapies



Primary Area: Prevention, Diagnosis and Treatment of Human Diseases

Disciplines: Medical technologies and tools for prevention, diagnosis and treatment of human diseases, therapeutic approaches and interventions, pharmacology, preventative medicine, epidemiology and public health, digital medicine

Sub-disciplines including but not limited to:

- Medical imaging for prevention, diagnosis and monitoring of diseases
- Medical technologies and tools (including genetic tools and biomarkers) for prevention, diagnosis, monitoring and treatment of diseases
- Nanomedicine
- Regenerative medicine
- Applied gene, cell and immune therapies
- Other medical therapeutic interventions, including transplantation
- Pharmacology and toxicology
- Effectiveness of interventions, including resistance to therapies
- Public health and epidemiology
- Preventative and prognostic medicine
- Environmental health, occupational medicine
- Health care, including care for the ageing population
- Palliative medicine
- Digital medicine, e-medicine, medical applications of artificial intelligence
- Medical ethics

Primary Area: Environmental Biology, Ecology and Evolution

Disciplines: Ecology, biodiversity, environmental change, evolutionary biology, behavioural ecology, microbial ecology, marine biology, ecophysiology, theoretical developments and modelling

Sub-disciplines including but not limited to:

- Ecosystem and community ecology, macroecology
- Biodiversity
- Conservation biology
- Population biology, population dynamics, population genetics
- Biological aspects of environmental change, including climate change
- Evolutionary ecology
- Evolutionary genetics
- Phylogenetics, systematics, comparative biology
- Macroevolution and paleobiology
- Ecology and evolution of species interactions
- Behavioural ecology and evolution
- Microbial ecology and evolution
- Marine biology and ecology
- Ecophysiology, from organisms to ecosystems
- Theoretical developments and modelling in environmental biology, ecology, and evolution



Primary Area: Biotechnology and Biosystems Engineering

Disciplines: Biotechnology using all organisms, biotechnology for environment and food applications, applied plant and animal sciences, bioengineering and synthetic biology, biomass and biofuels, biohazards

Sub-disciplines including but not limited to:

- Bioengineering for synthetic and chemical biology
- Applied genetics, gene editing and transgenic organisms
- Bioengineering of cells, tissues, organs and organisms
- Microbial biotechnology and bioengineering
- Food biotechnology and bioengineering
- Marine biotechnology and bioengineering
- Environmental biotechnology and bioengineering
- Applied plant sciences, plant breeding, agroecology and soil biology
- Plant pathology and pest resistance
- Veterinary and applied animal sciences
- Biomass production and utilisation, biofuels
- Ecotoxicology, biohazards and biosafety