World Molecular Imaging Society
Discover. Visualize. Learn. Cure.
Seeing clearly into the future of Molecular Imaging.

Category and Sub-Category Descriptions

Please carefully consider the following Category and Sub-category descriptions to find which section an individual abstract will best fit into the program.

Neuroscience

This emphasis covers all research on basic neuroscience and neurological disorders. This includes pathologies of the central and peripheral nervous system, as well as traumatic, degenerative, inflammatory and neoplastic nervous pathologies. In addition, it addresses basic and mechanistic research on the development and function of the nervous system.

Probes & Targets
The design, chemical synthesis and characterization of imaging probes and theranostic agents as well as reporter genes used to study the central and peripheral nervous system will be addressed. All imaging modalities will be covered.

Preclinical Imaging
All applications in neuroscience where new imaging tools, probes and therapeutics are evaluated on cells or animals belong to this category. It also includes the preclinical testing of image-guided therapies, and the use of optogenetics to probe cellular function.

New Biology
In this category, neuroscience research will be presented that mainly addresses new biological mechanisms and where imaging is rather used as a tool to gain the mechanistic insights. New approaches in bioengineering, optogenetics and new disease models will be considered.

Translational and Human Studies
Neuroscience research on humans or (non-human) studies with demonstrated potential for clinical impact or immediate translation should be submitted to this category. It includes prospective and retrospective studies as well as studies on new pharmaceuticals at phase I-IV where imaging plays a significant role in the study. Studies on Omics and its combination with imaging are also welcome.

Oncology

Solid and non-solid tumors, tumor development, progression and therapy are addressed in this emphasis. Multiscale research from cells to humans is covered that focuses on the mechanistic investigation of cancer-related biological processes, probe development and novel diagnostic and therapeutic applications.

Probes & Targets
The design, chemical synthesis and characterization of imaging probes and theranostic agents as well as reporter genes used to study neoplastic diseases will be addressed. All imaging modalities will be covered.

Preclinical Imaging
All applications in oncology where new imaging tools, probes and therapeutics are evaluated on cells or animals belong to this category. It also includes the preclinical testing of image-guided therapies.

New Biology
In this category, oncologic research will be presented that mainly addresses new biological mechanisms and where imaging is rather used as a tool to gain the mechanistic insights. New approaches in bioengineering and new disease models will be considered.

Translational and Human Studies
Oncology research on humans or (non-human) studies with demonstrated potential for clinical impact or immediate translation should be submitted to this category. It includes prospective and retrospective studies as well as studies on new pharmaceuticals at phase I-IV where imaging plays a significant role in the study. Studies on Omics and its combination with imaging are also welcome.

Cardiovascular & Pulmonary

Emphasis and Category Descriptions

Research in this emphasis addresses pathomechanisms of cardiovascular diseases, including myocardial dysfunction and infarction, atherosclerosis, arteritis, thrombosis and embolism as well as kidney dysfunction. It also covers investigations on the development of the cardiovascular system and the evaluation of therapeutic concepts.

Probes & Targets
The design, chemical synthesis and characterization of imaging probes and theranostic agents as well as reporter genes used to study cardiovascular diseases including, myocardial pathologies, vascular diseases and diseases of the kidney will be addressed. All imaging modalities will be covered.

Preclinical Imaging
All applications in cardiovascular research where new imaging tools, probes and therapeutics are evaluated on cells or animals belong to this category. It also includes the preclinical testing of image-guided therapies.

New Biology
In this category, cardiovascular research will be presented that mainly addresses new biological mechanisms and where imaging is rather used as a tool to gain the mechanistic insights. New approaches in bioengineering and new disease models will be considered.

Translational and Human Studies
Cardiovascular research on humans or (non-human) studies with demonstrated potential for clinical impact or immediate translation should be submitted to this category. It includes prospective and retrospective studies as well as studies on new pharmaceuticals at phase I-IV where imaging plays a significant role in the study. Studies on Omics and its combination with imaging are also welcome.

Systemic Diseases (kidney, liver and pancreas)

Research related to the investigation of metabolic pathways and mechanisms as well as metabolic diseases such as diabetes and osteoporosis fit into this emphasis. The emphasis may also include investigations on the gut-liver axis, liver and pancreas function (including islet cells) as well as on metabolism in fat tissues and other pathologically altered tissues and tumors. Studies on therapeutic interventions (e.g. new drugs or cell transplantations) will also be considered.

Probes & Targets
The design, chemical synthesis and characterization of imaging probes and theranostic agents as well as reporter genes used to study metabolic pathways and diseases will be addressed. All imaging modalities will be covered.

Preclinical Imaging
Research on metabolic pathways and diseases that include new imaging tools, probes and therapeutics and its testing on cells or animals belong to this category. It also includes the preclinical testing of image-guided therapies.

New Biology
In this category, research on metabolism and metabolic diseases will be presented that mainly addresses new biological mechanisms and where imaging is rather used as a tool to gain the mechanistic insights. New approaches in bioengineering and new disease models will also be considered.

Translational and Human Studies
Research on metabolic diseases in humans or (non-human) studies with demonstrated potential for clinical impact or immediate translation should be submitted to this category. It includes prospective and retrospective studies as well as studies on new pharmaceuticals at phase I-IV. Studies on Omics and its combination with imaging are also welcome.

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Emphasis and Category Descriptions

Immunology: Inflammation & Infection

Contributions to this emphasis will present work related to research on tissue inflammation, infection and immunology. There is certain overlap with other emphases but here inflammatory mechanisms will be clearly the focus. Examples include autoimmune disorders, organ fibrosis, asthma and inflammatory lung diseases, graft versus host reactions, bacterial and viral infections but also immunotherapies will fit into this emphasis.

Probe & Targets

The design, chemical synthesis and characterization of imaging probes and theranostic agents as well as reporter genes used to label immune cells (in vitro and in vivo) and inflamed tissues will be addressed. All imaging modalities will be covered.

Preclinical Imaging

All applications where new imaging tools, probes and therapeutics are evaluated on bacteria, cells or animals belong to this category. It also includes the preclinical testing of image-guided therapies.

New Biology

In this category, research on inflammation and infectious diseases will be presented that mainly addresses new biological mechanisms and where imaging is rather a tool to gain the mechanistic insights. New approaches in bioengineering and new disease models will also be considered.

Translational and Human Studies

Research on inflammation and infectious diseases in humans or (non-human) studies with demonstrated potential for clinical impact or immediate translation should be submitted to this category. It includes prospective and retrospective studies as well as studies on new pharmaceuticals at phase I-IV where imaging plays a significant role in the study.

Instrumentation

This emphasis covers all hardware developments that are related to imaging devices and diagnostic or therapeutic assist systems. It also includes strategies for image reconstruction as it relates to specific instrumentation.

Innovation in Instrumentation

This category will cover all research on new instrumentation, including imaging hardware and related image protocols or reconstruction techniques, hybrid imaging systems and (therapy) assist systems.

Image Guidance

Presentations will be about new endoscopic devices and related optical, ultrasound and optoacoustic technologies as well as on image-guided surgery.

Microscopy

Here, technologies and applications to image at mesoscopic down to subcellular level will be presented covering intravital microscopy, confocal and two photon microscopy, high resolution microscopy (e.g. STED, PALM, STORM) as well as mass spectroscopy (e.g. MALDI).

New Chemistry, Materials and Probes

This emphasis covers research whose primary innovation concerns chemical methods, materials and/or approaches which may have applications in multiple areas of biology rather than one specific disease. This includes research on new organic, inorganic or biomolecular probes, nanomaterials or synthetic strategies. The probes may be “always on”, responsive (as in biosensors) or have a

Emphasis and Category Descriptions

therapeutic effect (e.g., theranostics). Novel approaches for biochemical analysis (e.g., metabolomics, in vitro diagnostics) with applications in multiple areas of biology/disease are also part of this category.

New Chemistry for Optical Imaging
This category covers novel chemistry approaches and probe designs for optical imaging modalities (e.g., fluorescence, luminescence, photoacoustics) with applications in multiple biology/disease areas.

New Chemistry for Magnetic Resonance Imaging and Magnetic Particle Imaging
This category covers novel chemistry approaches and probe designs for MRI and MPI with applications in multiple biology/disease areas.

New Chemistry for Nuclear Imaging
This category covers novel chemistry approaches and probe designs for nuclear imaging with applications in multiple biology/disease areas.

New Chemistry for Ultrasound Imaging
This category covers novel chemistry approaches and probe designs for ultrasound imaging with applications in multiple biology/disease areas.

New Chemistry for Multimodal Imaging
This category covers novel chemistry approaches and probe designs for imaging with more than one modality and applications in multiple biology/disease areas.

New Approaches to Biochemical Analysis
This category covers novel approaches for biochemical analysis (e.g., metabolomics, in vitro diagnostics) with applications in multiple areas of biology/disease.

Bioengineering, Synthetic Biology and Basic Biology

This emphasis covers research whose primary innovation concernsbioengineering approaches at the level of proteins, genetic circuits and cells, which may have applications in multiple areas of biology rather than a specific disease. This includes reporter genes, cell-based biosensors, and related techniques. It also includes fundamental advances in gene-based and cell-based therapy (including genome editing) that apply to multiple biological or disease areas. In addition, it includes research in basic biology that does not fit into any of the existing biological or disease categories (for example, organismal development, evolutionary biology). Furthermore, research on “-omics” and systems biology approaches applicable to multiple biology/disease areas can be submitted to this emphasis.

Reporter Genes and Protein Engineering
This category covers novel reporter genes and protein engineering approaches with applications in multiple biology/disease areas.

Cell-Based Reporters, Therapeutics and Cellular Engineering
This category covers novel cell-based reporters, therapeutics, regenerative medicine and cellular engineering approaches with applications in multiple biology/disease areas. Genetic engineering and genome editing approaches are also included.

Tissue Engineering and Regenerative Medicine
This category addresses research in the fields of tissue engineering, regenerative medicine, organoid models and organs on a chip.

Systems Biology

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Emphasis and Category Descriptions

Systems biology applications search for mathematical descriptions of physiological and pathophysiological processes at different scales. In this context, input data may derive from imaging and Omics.

Basic Biology
This category covers research in basic biology that does not fit into any of the other biological or disease categories (for example, organismal development, evolutionary biology).

Computational & Data Science

This emphasis covers computational and methodological approaches to molecular imaging data, including modeling, image analysis, image processing and quantification.

Machine Learning: Applications
Pre-clinical or clinical studies that apply machine learning methods to analyze molecular imaging data form the basis of this category. The focus is on the use or evaluation of machine learning algorithms for applications in molecular imaging studies and analysis, as well as the inclusion of big data in studies.

Machine Learning: Basic Developments
Basic developments include new algorithms or conceptual approaches for statistical analyses that are broadly applicable to imaging or other data. This includes methods to improve the efficiency of machine learning (transfer learning) and other investigations into the development of machine learning itself.

Modeling & Quantification
This category covers the use, evaluation and novel approaches for modeling, quantifying and analyzing imaging data. This includes kinetic modeling of PET or other dynamic datasets, biological or biochemical models and simulations. Any new analytical or numerical approaches to quantify imaging data is appropriate for this category.

Image Pre/Post-processing
Novel methods to process or analyze imaging data are considered in this category. This can include pre- or postprocessing methods that address motion, physiology or other noisy parameters. It also includes new approaches in image registration, especially for multi-modal imaging data, and methods involving image reconstruction. Any methods that improve image quality, sensitivity or accuracy fall into this category.