Category and Sub-Category Descriptions

Please carefully consider the following Emphasis and 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.
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Cardiology
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.

Metabolism
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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Inflammation, Immunology & 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, Biology & Bioengineering
In this emphasis new emerging methods and tools are presented that have broader impact on many disease fields and thus cannot easily be assigned to one of the other emphases. In particular, research covering new chemistry and bioengineering approaches are
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suitable for this category. Also, novel biological approaches will considered in this category. Furthermore, research on Omics, Radiomics and systems biology can be submitted to this emphasis.

New Chemistry and Probe Concepts
This category covers any novel chemistry approaches and probe design, especially if they have cross-disciplinary applications or are in early stage.

Probes and Targets
The design, chemical synthesis and characterization of novel imaging probes and novel targets will be addressed. All imaging modalities and (cross-disciplinary) application categories will be covered.

Systems / Engineered Biology
Systems biology applications search for mathematical and modeling solutions to describe physiological and pathophysiological processes at different scales. In this context, input data may derive from imaging and Omics. This category also covers research on genome editing with engineered nucleases, technologies like CRISPR and in vivo gene screens as well as optogenetics.

Stem Cells and Regenerative Medicine
This category addresses research in the fields of tissue engineering, stem cell biology, stem cell therapies as well as regenerative medicine.

Methodology: Machine Learning & Data Processing
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.