

## Emphasis and 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

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This emphasis covers all research on neurological disorders including pathologies of the central and peripheral nerves, 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.

#### Probe Chemistry

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.

#### First-in-Man & Clinical Studies

Neuroscience research on humans 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

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

#### Probe Chemistry

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.

## Emphasis and Category Descriptions

### First-in-Man & Clinical Studies

Oncology research on humans 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.

### **Cardiology**

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Research in this emphasis addresses pathomechanisms of cardiovascular diseases, including myocardial dysfunction and infarction, atherosclerosis, arteriitis, 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.

### Probe Chemistry

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.

### First-in-Man & Clinical Studies

Cardiovascular research on humans 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.

### **Inflammation & Infectious Disease**

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Contributions to this emphasis will present work related to research on tissue inflammation and infection. There is certain overlap to other emphases but here inflammatory mechanisms will be clearly in the focus. Thus, diseases like 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 Chemistry

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.

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### 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.

### First-in-Man & Clinical Studies

Research on inflammation and infectious diseases in humans 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.

## **Metabolic Disease**

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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.

### Probe Chemistry

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.

### First-in-Man & Clinical Studies

Research on metabolic diseases in humans 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.

## **Instrumentation, Computation & Omics**

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This emphasis covers all hardware developments that are related to imaging devices and diagnostic and therapeutic assist systems. It also includes strategies for image reconstruction, processing and analysis. Furthermore, research on Omics, Radiomics and systems biology can be submitted to this emphasis.

### Innovation in Instrumentation

This category will cover all research on imaging hardware, image protocols and (MR) sequences, hybrid imaging systems, (therapy) assist systems and image reconstruction.

### Endoscopy & Image Guided Surgery

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

## Emphasis and Category Descriptions

### 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).

### Optogenetics

Methods and applications on optogenetics will be presented.

### Computer Applications & Postprocessing

Work on image processing and computer assisted data analysis as well as on Omics, Radiomics and systems biology methods and approaches will be presented in this category.

## **Transdisciplinary Imaging**

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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.

### 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.

### Developmental Biology and Reproductive Health

Research in this category is related to organs' developmental biology and to the connection of developmental mechanisms with diseases. Research can be performed on various species such as drosophila, zebrafish, xenopus, rodents and humans.

### Systems 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.

### Genome Editing

This category covers research on genome editing with engineered nucleases. DNA is inserted, replaced, or removed from the genome using artificially engineered nucleases. It covers research using technologies like CRISPR and in vivo gene screens

### Synthetic Biology

Research in this category addresses the application of engineering principles to the fundamental components of biology, including new DNA sequences, new proteins, up to new organisms and chimeric animal models, including new animal models.