

Theme 10

Biomaterials, Cellular and Tissue Engineering, Artificial Organs



Theme Chairs:

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ABSTRACT:

Theme 10 focuses on cell and tissue engineering a rapidly expanding field which applies the principles and methods of biophysical sciences, life sciences and biomaterial engineering for understanding physiological as well as pathological systems for modifying and creating cells and tissues for therapeutical applications. Cellular and tissue engineering is a scientific theme used as tool to study virtually all of the physiological systems of the body as well as pathologies such as cancer, cardiovascular diseases, (neuro) degenerative diseases, genetic diseases, and infections. Moreover, some concepts of biomaterials, cellular and tissue engineering have resulted in both clinical and experimental therapies for tissue repair for skin, bone, cartilage, muscles, and blood vessels, for supporting and/or enhancing metabolic functions such as liver metabolism and detoxification, for improving and localizing drug delivery, and as a vehicle for cell-based gene therapy. Furthermore, tissue engineering utilizes a variety of approaches to regenerate tissues. These approaches can be characterized into three major groups. Biomaterials, without additional cells, are used to convey biological signals to surrounding tissues to recruit cells and promote inherent regeneration. Cells alone may be used, without scaffolds, to generate tissues. Finally, cells may be used with biomaterials as scaffolds acting as architectural frameworks for developing tissues. The technology focuses on the latter technique of developing and using biomaterial scaffolds for tissue engineering.

Theme 10 focuses on novel technologies in the field of nano-bioengineering that draws on synergies among engineers, physicians, and biomedical scientists to provide new interdisciplinary insights into medical and biological problems. The program offered in the tracks seek to emphasize the confluence of basic engineering with the physical and biological sciences, particularly in the areas of biomechanics, molecular cellular and tissue engineering, biomedical imaging and monitoring e.g. biophotonics and cytometry.

TRACKS:

Cytomics in High-Content Diagnosis

Track Chairs:

Attila Tamok,
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J. Paul Robinson,
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Active and Passive Biomechanics of Cells

Track Chairs:

Josef Alfons Käs,
University of
Leipzig, Germany

Jochen Guck,
University of Cambridge,
UK

Current Advances in Stem Cell Biology

Track Chairs:

Martin Zenke,
RWTH Aachen University,
Germany

Jan-Thorsten Schantz,
Technical University of
Munich, Germany
National University of
Singapore

Biomedical Imaging in TE/RM*

Track Chairs:

Georg N. Duda,
Charité,
Berlin, Germany

Robert E. Guldberg,
Georgia Institute of
Technology,
Atlanta, USA

TE/RM* from a Translational Research and Clinical Point of View

Track Chairs:

Michael Sittinger,
Charité,
Berlin, Germany

Jan-Thorsten Schantz,
Technical University of
Munich, Germany
National University of
Singapore

Nanotechnology in TE/RM*

Track Chairs:

Daniel Müller,
Biotechnology Center
Dresden, Germany

Kevin Shakesheff,
University of
Nottingham, UK

Biomaterials & Controlled Drug Release in TE/RM*

Track Chairs:

Oliver Pänke,
University of Leipzig,
Germany

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