

EUROMAT 2019 / Area F Materials for Healthcare

SYMPOSIUM: F6

Title: Additive manufacturing of biomaterials		
Organizer	Institution	Contact email
Jürgen Stampfl	TU Wien, Institute of Materials Science and Technology	juergen.stampfl@tuwien.ac.at
Hermann Seitz	University of Rostock, Fluid technology and microfluidics	hermann.seitz@uni-rostock.de
Anders Palmquist	Institute of Clinical Sciences, Sahlgrenska Academy, University of Gothenburg	anders.palmquist@biomaterials.gu.se
Abstract		
<p>Additive manufacturing (AM) offers significant advantages for tissue engineering and biomedical technology due to its ability to create very complex as well as patient-specific parts. Biomedical applications relying on AM can be found in a number of fields, including hearing aids, implants, parts for restorative dentistry and orthodontics. Many of those applications are key drivers for the recent growth of the worldwide AM market. Bioprinting of artificial organs, 3D-cell-culture and biofabrication (e.g. printing of osteochondral scaffolds) could be some of the future growth drivers of the field.</p> <p>One of the major bottlenecks that limits the widespread acceptance of additive manufacturing is the lack of diversity in biomaterials for AM processes. In addition, insufficient efforts in standardization and regulatory approval limit the use of existing AM-compatible biomaterials. Although a wide range of biomaterials, including metals, polymers, ceramics, hydrogels and composites have been developed, the processing of these materials into parts and devices with tunable structural (e.g. mechanical properties) or functional properties (degradation behavior, bioactivity, ...) is still challenging.</p> <p>This symposium will review recent developments in biomaterials for AM technologies that can be processed into implants, scaffolds, biosensors, drug delivery devices, and medical devices. Materials of interest include biocompatible and biodegradable polymers (e.g. biophotopolymers, hydrogels, thermoplasts, ...) as well as ceramics (e.g. tricalcium phosphates, alumina, zirconia, bioglasses, ...) and metals (titanium, magnesium). Composite materials and their processing are of high interest. Fabrication and characterization of digital materials (e.g. gradient materials, materials with spatial functionalization, ...) also fall into the scope of this symposium.</p>		

Since the resulting properties of the final material are strongly connected to the specifics of the utilized AM process, presentations related to process optimization and adaptation fall within the targeted range of the symposium, if they have a clear connection to biomaterials.