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Symposium F3

Title: Additive Manufacturing of Biomaterials		
Organizer	Institution	Contact email
Sonja Baumgartner	TU Wien	sonja.baumgartner@tuwien.ac.at
Hermann Seitz	Universität Rostock	hermann.seitz@uni-rostock.de
Ramón Escobar-Galindo	Universidad de Sevilla	rescobar1@us.es
Abstract		
<p>The possibility of generating complex structures, together with the concept of personalized medicine, has allowed the success of Additive manufacturing (AM) in the medical sector. Advances in radiological imaging techniques have enabled the use of medical imaging data to print 3D models and reconstruct anatomical parts of patients using computer aided design (CAD). Bioprinting of tissues and artificial organs, 3D-cell-culture and biofabrication (e.g. printing of osteochondral scaffolds), customized 3D tools (e.g. patient-specific surgical guide), 3D anatomical models and personalized implants (e.g. orthoses, hearing aids, restorative dentistry), could be some of the future growth drivers in the field of AM biomaterials.</p> <p>Major bottlenecks that limit the widespread acceptance of additive manufacturing are the lack of diversity in biomaterials for AM processes as well as insufficient standardization and regulatory. 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 personalized implants, scaffolds, biosensors, drug delivery devices, and medical devices. Materials of interest include biocompatible and biodegradable polymers (e.g. biophotopolymers, hydrogels, thermoplastics) as well as ceramics (e.g. tricalcium phosphates, alumina, zirconia, bioactive glasses, ...) and metals (e.g. titanium, magnesium). Fabrication, characterization and surface functionalization of composite and digital materials (e.g. gradient materials, materials with spatial functionalization ...) will also fall into the scope of this symposium, as well as specific AM process optimizations and adaptations for processing biomaterials (including design and simulation).</p> <p>The goal of this symposium is to bring together material researchers of diverse backgrounds (experimental, characterization, analysis, and computational) with medical experts to address together the multidisciplinary challenges of this emerging field. Graduate students, post-docs, and early-career researchers are encouraged to submit abstracts.</p>		