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Biomaterials

Advances in Biomaterials for 3D Printing

Biomaterials have been widely utilized in a variety of biomedical applications, such as tissue engineering, regenerative medicine, biosensors and medical implants, due to their inherent physical and chemical properties including biocompatibility, tunable mechanical properties and biodegradability, and hierarchical internal structures. Additive manufacturing, based on layer-by-layer fabrication mechanism, possesses critical advantages in fabrication of 3D structures of biomaterials for various biomedical applications, including complex geometries, heterogeneity, porosities, and incorporation of different growth factors.

Typical 3D printing techniques used for biomaterials include inkjet printing, microextrusion, laser-assisted printing, stereolithography, to name a few. The most common biomaterials used in 3D printing are ceramics, polymers, and composites. The post-printing properties and microstructures are of great importance to the biomaterial functionality, such as mechanical properties, physical properties including swelling and degradation properties, pore size and porosity.

The symposium shall focus on the recent advances in the biomaterials for 3D printing. Specific topics of interest include, but are not limited to:

- Fabrication of biomaterials-based scaffolds
- Characterization of post-printing biomaterials
- Modeling and simulation of biomaterial properties
- Fabrication of biomaterials-based heterogeneous structures
- Novel biomaterials for 3D printing
- Bioprinting of cellular structures
- Novel 3D printing techniques for biomaterials
- Cell-biomaterial interaction

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