— Call for Papers —

A Symposium on

Advances in 3D Bioprinting of Tissue Scaffolds and Organs

Sponsored by the ASME Manufacturing Engineering Division's
Biomanufacturing Technical Committee
2019 ASME International Manufacturing Science and Engineering Conference (MSEC)*
June 10-14, 2019
Erie, Pennsylvania
Hosted by Pennsylvania State University, The Behrend College

Technical Focus

Additive manufacturing is driving major innovations in tissue engineering and regenerative medicine. Recent advances have enabled 3D printing of extracellular matrix materials and cells into complex 3D functional living tissues and organs. Such fabricated tissues and organs are envisioned to be used for the replacement of damaged or injured human tissues and organs, providing a promising solution to the challenge of tissue and organ donor shortage. 3D bioprinting, precisely positioning various tissue spheroids on the substrate in a computer-aided pattern, has been widely utilized to fabricate the engineered tissues and organs based on a layer-by-layer manner. The common 3D bioprinting techniques include inkjet printing, microextrusion and laser-assisted printing. The typical bioprinting process of 3D tissues and organs are composed of three key steps:biofabrication of 3D cellular constructs, tissue fusion and tissue maturation. This highly interdisciplinary topic requires integration of engineering, materials science, cell biology and medicine. The associated challenges and complexities include material selection, cell and material interaction, manufacturing challenges related to the sensitivities of living cells, design and optimization of tissue and organ constructions. This symposium will focus on the state-of-the-art research advances in the area of biofabrication of tissue-engineered scaffolds and 3D tissue/organ constructs. The resulting understanding will bridge the manufacturing science and biomedical applications for more efficient and effective fabrication of 3D engineered tissues and organs. Specific topics of interest include, but are not limited to:

- Novel bioinks and biomaterials for bioprinting
- Bioink rheological properties and printability
- Modeling and analysis of biopolymer processing
- Cell printing and cell encapsulation
- Engineering 2D/3D cellular microenvironments
- Design, fabrication and characterization of 3D tissue-engineered scaffolds
- 3D bioprinting of complex tissues and organs
- Novel advanced manufacturing techniques for cell and biomaterial processing
- Organ-on-chips
- Microfluidic devices for biomedical applications
- Bioreactor systems for tissue engineering
- Cell-biomaterial interaction: cell migration, aggregation and distribution
- Tissue ingrowth and functionality

Paper Submission

Authors are encouraged to submit an abstract and full manuscript for review by **November 02, 2018** via the conference website. Final revised manuscripts must be submitted by **March 15, 2019**. The copyright transfer form must be filled out by March 8, 2018, and the presenting author must pre-register by **April 05, 2019;** or the paper will be withdrawn from the conference. Authors may also consult www.asme.org/divisions/med/call/ for updates. *No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at* www.asmeconferences.org/msec2019/.

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* The conference is collocated with NAMRI/SME's 47th North American Manufacturing Research Conference (NAMRC47), which will have a separate call-for-papers. Please note that submissions of the same paper to more than one conferences are not permitted.