— Call for Papers —

A Symposium on

Advances in 3D Bioprinting of Tissue-Engineered Scaffolds and Living Tissue Constructs

Sponsored by the ASME Manufacturing Engineering Division's

Biomanufacturing Technical Committee

2020 ASME International Manufacturing Science and Engineering Conference (MSEC)*

June 22 – 26, 2020

Cincinnati, Ohio

Hosted by the University of Cincinnati, College of Engineering and Applied Science

Technical Focus

Three-dimensional (3D) bioprinting is driving major innovations in tissue engineering and regenerative medicine, in which cell inks composed of extracellular matrix (ECM) materials and cells are printed into complex 3D functional living tissues and organs using various additive manufacturing approaches in a layer-by-layer manner. 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. 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: 3D bioprinting of cellular constructs, tissue fusion, and tissue maturation. This highly interdisciplinary topic requires integration of manufacturing, materials science, biology, and biomedical engineering. The associated challenges and complexities include biomaterial selection, interaction between cells and ECM materials, 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 3D bioprinting of tissue-engineered scaffolds and living tissue constructs. The resulting understanding will bridge the manufacturing and materials science and biomedical applications for more efficient and effective fabrication of 3D living tissues and organs. Specific topics of interest include, but are not limited to:

- Novel bioinks and biomaterials for 3D bioprinting
- Bioink rheological properties and printability
- Modeling and analysis of biomaterial processing
- 3D bioprinting of complex cellular tissues and organs, and cell printing/encapsulation
- 3D printing of responsive materials for biomedical applications
- Innovation of new 3D bioprinting approaches
- Design, fabrication and characterization of 3D tissue-engineered scaffolds
- 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 15, 2019** via the conference website. Final revised manuscripts must be submitted by **March 26, 2020**. The copyright transfer form must be filled out by March 19, 2020 and the presenting author must pre-register by **April 15, 2020** or the paper will be withdrawn from the conference. ***No papers are to be submitted to the organizers; submissions will only be accepted via the conference website at https://event.asme.org/MSEC/*** .

All papers accepted by MSEC2020 can be further submitted to any ASME journals, such as the highly prestigious Journal of Manufacturing Science and Engineering, for consideration of archival publication. In addition, high quality MSEC2020 papers will be automatically channeled to relevant ASME journals for fast-tracked publications.

Additional Symposium Activities

To highlight advancements in this technical area, symposium organizers will:

- Work to attract a high profile international keynote speaker
- Organize a special issue in an ASME Journal with a state-of-the-art paper that will be the lead article in the special issue

Organizers:

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* The conference is collocated with NAMRI/SME's 48th North American Manufacturing Research Conference (NAMRC48) and LEM&P (Leading Edge Manufacturing / Materials and Processing) by The Japan Society of Mechanical Engineers (JSME), which will have a separate call-for-papers. Please note that submissions of the same paper to more than one conferences are not permitted.