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"The abstract deadline for the @ISBioFab Twitter Poster Conference on June 5/6th has been extended to Friday May 24th. If you are an early career researcher in biofabrication, register now to participate and share your latest research. Awards included for best contributions!"

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Shab Hassa @shaha_ka · May 22

Extended to 24th May or 24th June? Please clarify.

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Title of your poster*

3D Printing of Magnetic Patterned Construct to Recapitulate Left Ventricular Myocardial Fiber Orientation

Authors*

Please include all authors and affiliations. Please indicate the presenting author by underlining their name.

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Abstract*

Describe the content that will be included in your poster with a brief introduction, methods, results, and conclusions. Do not include graphics/figures/images. Max 200 words.

The heart's ventricles exhibit a complex arrangement of myocardial fibers, each oriented differently for optimal contraction. However, efforts to create *in vitro* models that mirror this arrangement and its function have been unsuccessful or inconsistent. Our research aims to design automated engineering processes for single-layer microfabricated modules to achieve consistent and reliable outcomes in constructing multilayered Engineered Heart Tissues (EHTs). In this study, we propose a novel approach that uses magnetic anisotropy programming and four-dimensional (4D) printing technology to impart magnetic anisotropy to three-dimensional (3D) printed structures. Our study focused on three main objectives: optimizing the magnetic ink and patterning magnetic anisotropy, creating a uniaxially aligned magnetic EHT module, and assembling layers of tissue into a functional EHT layer. The magnetic frameworks were used to enclose the cardiac tissue and then transform it into a 3D chamber upon exposure to an external magnetic field. Our future research will aim to develop tissue constructs that arrange cardiomyocytes in various orientations and integrate them to function as a unified cardiac tissue. Our system has the potential to create intricate 3D microstructures with hierarchical arrangements, similar to those found in the lungs and liver, which could contribute to advanced biomedical applications.