

Instrumented and 3D printed human tissue models

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Multi-material 3D printing is opening fundamentally new opportunities within biomedicine, not least as basis for creating stem cell-derived human tissue and organ models for preclinical and toxicological research. The key to unlocking the full potential of this technology lies in the development of bio-functional print materials.

In this talk, I will present our ongoing research within the development of new bio-printing technologies and give examples of how printed bio-materials can instruct in vitro tissue formation in 2D and 3D. Moreover, I will give examples of how engineered human tissues may be merged with embedded soft sensors and actuators for real-time stimulation and recording of tissue performance. Focusing on cardiac muscle, I will show examples of how such instrumented tissue models can enable higher throughput drug-dose studies, long-term experiments, and disease models of ischemic-reperfusion heart injuries.