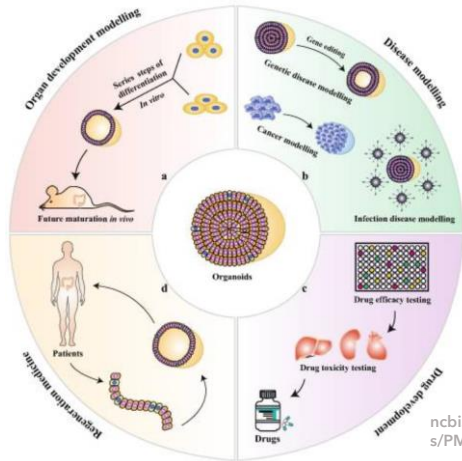
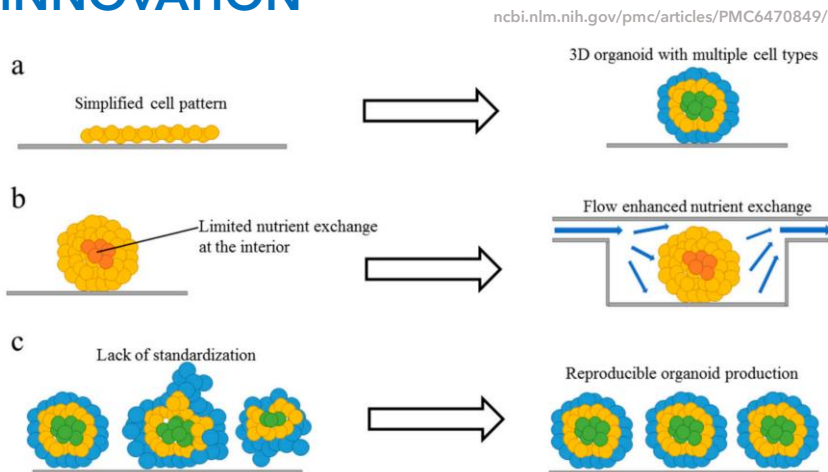


SIGNIFICANCE



Patient-derived organoids are three-dimensional tissue constructs that represent the multicellular structure and complexity of a patient's organ. They are particularly of interest for studies involved in personalized medicine, disease modeling, and drug development.

INNOVATION

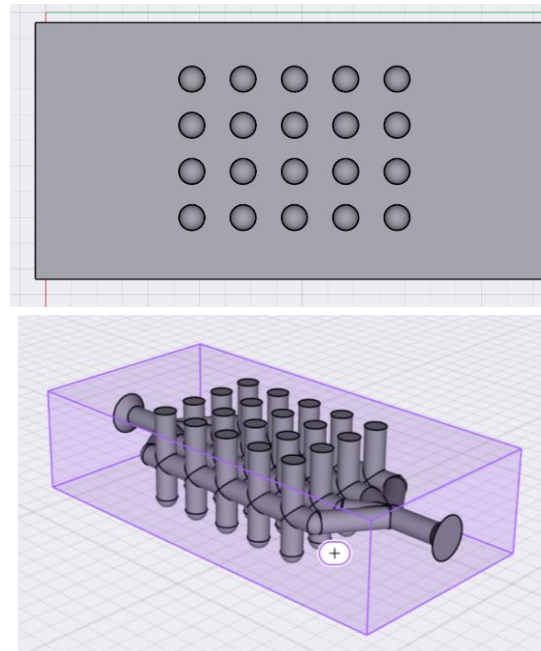
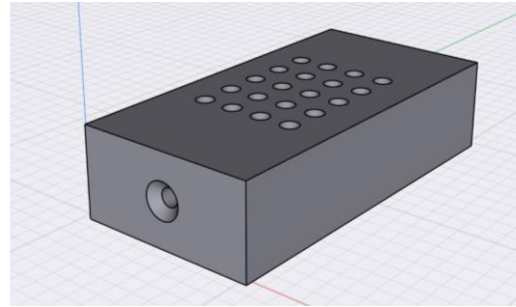


Current limitations in organoid culture include lack of standardization and reproducibility for high-throughput screening in drug discovery and personalized medicine.

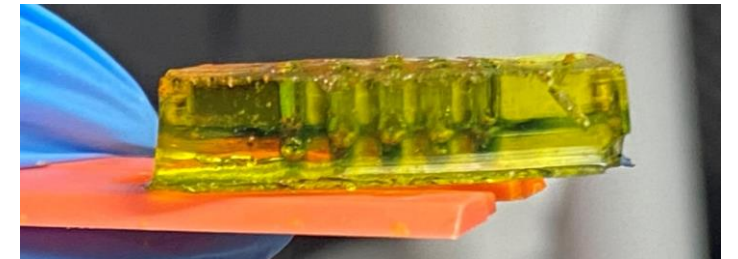
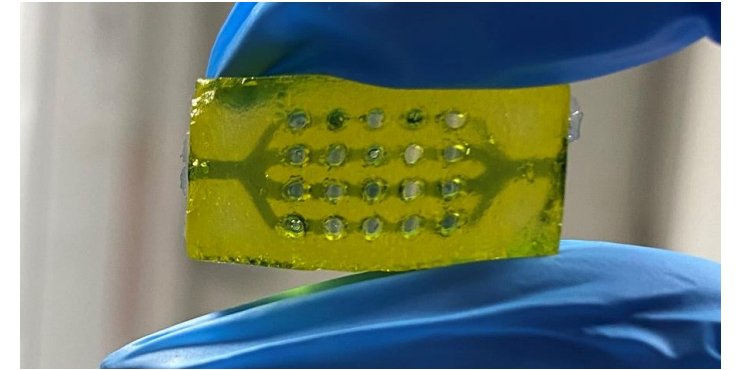
HYPOTHESIS & METHODOLOGY

If we can control organoid growth parameters within a device that promotes reproducibility and nutrient flow, then we can enhance and standardize organoid culture for high-throughput assays.

This device was achieved through computer-aided design and digital-light processing (DLP) bioprinting.



RESULTS



The latest prototype consists of a 4 x 5 array of chambers for high-throughput organoid growth, along with inlet/outlet for perfusion flow of nutrients to avoid necrosis. The device is 20 x 10 x 5 mm with both channels and chambers of 1.0 mm diameter.

CONCLUSIONS & FUTURE WORK

The prototype is currently being validated for spheroid culture of cancer cells prior to validation of organoid culture. Future work will consist of comparing organoid growth in the device versus traditional methods for drug screening in patients.

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