

# 3D Bioprinting via Dynamic Optical Projection and Applications Thereof

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## BACKGROUND

Complex 3D interfacial arrangements of cells are found in biosystems such as blood vasculature, renal glomeruli, and intestinal villi. Tissue engineering techniques have been used to fabricate 3D microenvironments that mimic such biosystems but most methods fail to reproduce the concurrent effects of complex topography and cell encapsulation. There is a need to develop new approaches that control cell density and distribution within complex 3D features, and for biological scaffolds that reflect the true native physiology.

## TECHNOLOGY DESCRIPTION

University researchers have developed a versatile biofabrication platform based on 3D printing via dynamic optical projection, and fabricated complex, 3D micro-featured structures with encapsulated cells using said bioprinting platform. The invention provides an improved ability to mimic native tissue environments by controlling the arrangement of cells within a patterned 3D hydrogel. It has the potential for broad impact in the fields of tissue engineering, drug discovery, and fundamental cell biology research.

## INTELLECTUAL PROPERTY INFO

This technology is available for sponsored research and/or licensing.

## RELATED MATERIALS

- [Digital microfabrication of user-defined 3D microstructures in cell-laden hydrogels. Biotechnology and Bioengineering Volume 110, Issue 11, pages 3038–3047, November 2013 - 11/01/2013](#)

## PATENT STATUS

Country	Type	Number	Dated	Case
United States Of America	Issued Patent	<a href="#">10,464,307</a>	11/05/2019	2013-291
United States Of America	Published Application	<a href="#">20160298087</a>	10/13/2016	2013-212

Additional Patent Pending

## CONTACT

University of California, San Diego  
Office of Innovation and Commercialization  
[innovation@ucsd.edu](mailto:innovation@ucsd.edu)  
tel: 858.534.5815.



## OTHER INFORMATION

### KEYWORDS

3D printing, biofabrication, hydrogels,  
tissue engineering, scaffolds

### CATEGORIZED AS

- **Materials & Chemicals**
  - Biological
- **Research Tools**
  - Screening Assays
- **Sensors & Instrumentation**
  - Other

### RELATED CASES

2013-291-0, 2014-140-0, 2013-212-0