

# Device and Method for Accelerating and Guiding Vascularization

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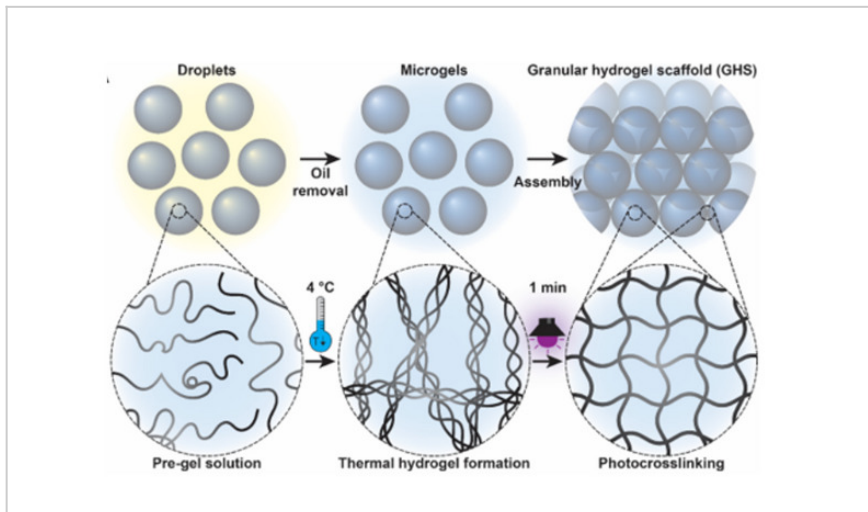


Figure 1. GelMA droplets to microgels, yielding hydrogel scaffolds.

## Technology Summary

Hydrogel scaffolds have some major limitations, including slow and random vascularization. A novel microsurgical approach termed micropuncture (MP) has recently been developed that significantly expedites scaffold vascularization, but it does not address the issue of random vascularization. Inducing rapid patterned vascularization within biomaterials has implications in clinical treatment paradigms and the scaleup of regenerative engineering platforms. To address this challenge, the MP approach can be combined with granular scaffold technology to hasten and pattern microvascular network formation

## Application & Market Utility

Hydrogel scaffolds provide a base for revascularization making it a vital technology for tissue reconstruction. Hydrogel technology has been used in response to various infections that have led to more severe injuries such as loss of limb or life. The proposed invention can induce rapidly patterned vascularization which is an unfulfilled area of need in hydrogel scaffolds. As of 2022, the market for scaffolds is estimated to be \$1.25 billion. There is projected growth in the scaffold market with expectations for the value to reach \$2.63 billion by 2030.

## Next Steps

Researchers have plans to initiate collaborative efforts with physician researchers, aiming to demonstrate their innovation within real-world medical contexts, along with seeking strategic licensing partners.

### TECHNOLOGY READINESS LEVEL

4

#### Seeking

Investment | Licensing | Research

#### Keywords

- Scaffold
- Hydrogel
- Micropuncture
- Granular

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