

Photoannealing of Microgels to Form Heterogeneous Constructs

Tech ID: 34697 / UC Case 2022-553-0

ABSTRACT

Researchers at the University of California, Davis have developed a method for creating annealed microgel scaffolds using polyethylene glycol-vinyl sulfone, offering improved efficiency and shelf life.

FULL DESCRIPTION

The technology is a novel method for creating annealed hydrogel constructs using 8-arm polyethylene glycol-vinyl sulfone (PEG-VS) microgels. The construct can be tailored to present different biochemical and biophysical properties. The PEG-VS microgels are initially synthesized with PEG-DT, leaving about 30% of the arms free for additional crosslinking at a later time to anneal the microgels. The microgels are then washed and exposed to UV light for annealing. The method is a significant improvement over existing methods, offering easier operation, less time consumption, and increased shelf life.

APPLICATIONS

- ▶ Biomedical engineering for tissue scaffolding.
- ▶ Drug delivery systems.
- ▶ Regenerative medicine and stem cell research.

FEATURES/BENEFITS

- ▶ Simplified method compared to using transglutaminase peptides.
- ▶ Reduced time requirement for the annealing process.
- ▶ Greater shelf life due to less susceptibility to oxidation.
- ▶ Capability to create varied biochemical and biophysical constructs.
- ▶ Addresses complexities and time consumption in annealing process of microgel scaffolds.
- ▶ Addresses oxidation and decreased activity over time with substances like transglutaminase peptides.

PATENT STATUS

Patent Pending

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OTHER INFORMATION

KEYWORDS

annealing, biomedical engineering, drug delivery, hydrogel, microgels, polyethylene glycol-vinyl sulfone, photoannealing, regenerative medicine, scaffolds, stem cell

CATEGORIZED AS

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