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## Facile One-Step Micropatterning Using Photodegradable Gelatin Hydrogels for Improved Cardiomyocyte Organization and Alignment

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### Abstract

Hydrogels are often employed as temporary platforms for cell proliferation and tissue organization in vitro. Researchers have incorporated photodegradable (PD) moieties into synthetic polymeric hydrogels as a means of achieving spatiotemporal control over material properties. In this study protein-based PD hydrogels composed of methacrylated gelatin and a crosslinker containing o-nitrobenzyl ester groups are developed. The hydrogels are able to degrade rapidly and specifically in response to UV light and can be photopatterned to a variety of shapes and dimensions in a one-step process. Micropatterned PD hydrogels are shown to improve cell distribution, alignment, and beating regularity of cultured neonatal rat cardiomyocytes. Overall this work introduces a new class of PD hydrogel based on natural and biofunctional polymers as cell culture substrates for improving cellular organization and function.

### Keywords

**KeyWords Plus:** CELL-CULTURE; METHACRYLATE HYDROGELS; CARDIAC TISSUES; FIBROBLASTS; TOPOGRAPHY; ELONGATION; PHENOTYPE; SCAFFOLDS; FATE; 3D

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