

Optical cell manipulation using biomaterial-based photodegradable hydrogels

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We have developed a photocleavable crosslinker for preparing photodegradable hydrogels by means of a one-step mixing reaction between the crosslinker and biocompatible polymers. We could control the chemical property of the photodegradable hydrogel by choosing the base polymer. We could prepare the biomaterial-based photodegradable hydrogels, on which cells adhered, and in which cells were encapsulated. So far, we have demonstrated cell separation from three-dimensional culture environment, cell micropatterning, and perfusion culture in the microfluidic devices. These studies will create new opportunities as novel the cell manipulation technologies in science and industry.