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Preparation of micropatterned PEG hydrogels by a UV irradiation process for biomedical applications

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Biocompatible polymers such as polylactic acid (PLA), poly (lactic-co-glycolic acid) (PLGA), and polyethylene glycol (PEG) are used for various biosensor applications. And PEG hydrogels can be applicable to microfluidic chips or biosensor devices as a sensing microstructured block in a microchamber of a biosensor chip. In this study, various microstructured PEG hydrogels in the range of 200-700 μm size were prepared by UV irradiation process with a micropatterned photomask. UV curable PEG hydrogels were used to prepared microstructured PEG hydrogels. PEG microstructures were obtained by UV irradiation for 7-20 seconds. Furthermore microporous PEG hydrogels were prepared by a UV irradiation process and a polymer removing process. The prepared microstructured PEG hydrogels and microporous PEG structures were characterized by a geometric investigation and an absorption test with PBS buffer solution and human serum. Then the prepared microstructured PEG and microporous PEG structures can be applicable to a biosensor or biomedical applications.

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