

Interpenetrating Polymer Network Structured Hybrid Hydrogel based on Mussel-Inspired copolymer

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Tough and adhesive hydrogels are the promising materials for various applications in the field of tissue engineering and biomedical. Interpenetrating Polymer Network(IPN) structured hydrogels have promising potential of simplicity of synthesis, strong mechanical properties and high transparency. Mussel-inspired copolymers are known to have significant adhesion and prominent mechanical properties. In this study, IPN structured hybrid hydrogels were fabricated with copolymers based on DOPA derivatives and Polyacrylamide(PAM) that can be efficiently and rapidly activate by initiator and cross-linker without the assistance of external stimuli. These copolymers based on DOPA derivatives with different kinds of acrylic monomers were used to improve the adhesion of hydrogels, which were prepared by free radical copolymerization. IPN structured hybrid hydrogels with copolymers based on mussel inspired DOPA derivatives-PAM exhibited superior elastic properties, toughness and adhesiveness.