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Synthesis and Characterization of Biodegradable Elastomeric Polyester Amide for Tissue Engineering Applications

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Abstract : Biodegradable poly(ester amide)s are promising polymers for biomedical applications such as drug delivery and tissue engineering because of their optimized chemical and physical properties. In this study, we developed a biodegradable polyester amide elastomer poly(serinol sebacate) (PSS) composed of crosslinked networks based on serinol and sebacic acid. The synthesized polymers were characterized to evaluate their chemical structures, mechanical properties, degradation behaviors and in vitro cytocompatibility. Analysis of proton nuclear magnetic resonance and Fourier transform infrared spectroscopy revealed the structure of the polymer. The PSS exhibit excellent solubility in a variety of solvents such as methanol, dimethyl sulfoxide and dimethylformamide. More importantly, the mechanical properties of PSS could be tuned by changing the curing conditions. In addition, the 3T3 fibroblast cells cultured on the PSS demonstrated good cell attachment and high viability.

Keywords : biodegradable, biomaterial, elastomer, mechanical properties, poly(serinol sebacate)
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