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Preparation and analysis of a sustained drug delivery system by PLGA–PEG–PLGA triblock copolymers

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Abstract Traditional drug delivery systems that are based on multiple dosing are usually accompanied by many shortcomings, including unwanted fluctuations in the plasma concentration of the drug and poor patient compliance. In this study, we aimed to synthesize a polymeric drug delivery system based on a triblock copolymer of PLGA–PEG1000–PLGA and investigate its application as a controlled drug delivery system. Naltrexone hydrochloride and vitamin B12 were used as model drugs here. The copolymer was successfully synthesized by the ring-opening method. A phase transition analysis indicated that the copolymer is in gel at body temperature. The release profiles from the formulations showed a higher initial release followed by a slower pattern for up to 4 weeks. More than 50 % of the vitamin B12 and 60 % of the naltrexone hydrochloride were released during this period.

Keywords PLGA–PEG–PLGA · Triblock copolymer · Naltrexone hydrochloride · Vitamin B12 · Controlled release · Hydrogel · In situ-forming system

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