The Preparation of PLGA Microspheres with Calcium Alginate Surface Modification

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The aim of this study is to fabricate an Alginate-modified PLGA (poly -lactic-co- glycolic acid) composite microspheres for drug delivery. Hydrophobic drugs loaded in PLGA microspheres and coated by Calcium Alginate are prepared through a emulsion solvent evaporation method of oil-in-water-in-oil (o/w/o). Subsequently, data is conducted on the effects of different concentrations of substance（PLGA, Span80, Sodium alginate, Calcium chloride）on microspheres' encapsulation efficiency. The formulations are then characterized in terms of morphology, mean diameter and encapsulation efficiency, and the drug release curve is evaluated both in vitro and in vivo. As a result, a high loading efficiency of more than 60%is observed when the size of microspheres is 33.36 μm. Both in vitro and in vivo experiment displayed a sustained release trait of hydrophobic drugs from composite microspheres with lower initial burst release than ordinary PLGA microspheres. Therefore, the obtained alginate-decorated PLGA microspheres with small size could be a promising device for controlled drug release.