Αγγλική Περίληψη

Over the past few years, a wide range of polymers have been applied in the fields of Nanomedicine as well as in the field of Pharmaceutical Industry. A number of biodegradable polymers are able to form nanoparticles that can be loaded with various drugs, and can be used as carriers for drug delivery. They gradually degrade inside the host organism releasing specific amount of drug in a controllable way. These drug eluting polymeric nanoparticles can be of use in cardiovascular applications, in order to inhibit thrombosis and to restore the natural tissue healing faster while at the same time minimizing possible harmful reactions, such as inflammation. In this study, we design and develop an experimental procedure to synthesize nanoparticles loaded with dipyridamole, via the nanopercipitation technique. More specifically, Poly (DL-lactide-co-glycolide) (PLGA) with different contents of lactide:glycolide which are coated with Polyethylene Glycol (PEG) and Albumin (BSA) are used to form nanoparticles. They are then separated from free drug by centrifugation. The z- potential values and the mean size of the nanoparticles are measured. The morphological and structural characteristics of the nanoparticles, are examined through Scanning Electron Microscopy (SEM) and Atomic Force Microscopy (AFM). The results reveal that the nanoparticle mean size and zeta potential values are related to the drug's existence. In addition, it was pointed that the choice of the polymer is not a major factor. Stability and Turbidity experiments showed that the nanoparticle dispersions are stable throught time, avoiding the formation of aggregates. The drug loading experiments showed a small percentage of initial dipyridamole uptake and the drug release experiments revealed a two phase kinetic model. The SEM as well as the AFM images verifies the results from the Zetasizer.