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Preparation of novel anti-breast cancer vaccine by nanoencapsulation technique from biopolymer (lactide-co-glycolic).

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Background and Aims: Optimal presentation of peptide vaccines is one of the major challenge in pharmaceuotical technology.encapsulation of peptide and protein in nanoparticles (NPs) causes to: prevent of antigen degradation by proteolytic enzymes, increase shelf life of antigens in circulation and decrease need for adjutants in immunological systems.PLGA is one of the best biodegradable polymer that use for preparation of nano capsule drugs. in this approach, we explore the NPs morphology, encapsulation efficiency
Methods: NPs were fabricated with double emulsion solvent evaporation method (water/oil/water) , PLGA copolymers (50 : 50%) , were dissolved in dichloromethane (DCM). Protein solution (tumor lysate) was added to this organic solvent, and followed by high-speed homogenization or sonication . this early emulsion was then added to polyvinil alcohol (5%) and sonicated . This second emulsion was poured into PVA (0.3%) And stirred. NPs were centrifuged and washed. In other methods PLGA were dissolved in aceton,acton/DCM for comparison solvent together. Measurement of nanoparticles can be carried out by scanning electron microscope (TESCSAN, 22,000×, 10KV).
Results: The surface and bulk morphology are important in determining the drug release kinetics of nanoparticles, base on SEM, mean size of nanoparticle was determine about 200-400 nm, but generality of them were 250nm.they have a regular spherical shape.
Conclusions: In comparison to larger particles, nanoparticles, for their greater surface to weight ratio and smaller size respectively have better uptake and facilitate release. sonication time, PVA concentration, ratio between aqueous and organic phases have a significant influence on size distribution of NPs. we found that higher concentration of PVA, decreasing the nanoparticle size and DCM as a organic solution in comparison with acetone ,co-mixture of acetone/DCM has a best solubility and less miscibility. emulsification process and stability of emulsion were the most important factors to control the particles size.

Keywords: Nanoparticles; Controlled release; PLGA; Tumor lysate proteins; Emulsification evaporation method