

عنوان مقاله:

Design and Synthesis of erythropoietin nanoparticle coated with Gemini cationic surfactant (as a carrier) for delivery of human Erythropoietin to brain

محل انتشار:

پانزدهمین همایش بیوشیمی فیزیک ایران (سال: 1397)

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خلاصه مقاله:

Erythropoietin (EPO) is a hematopoietic growth factor. Also EPO as a neuroprotective agent can prevent neuronal death in brain damage. But this protein has no ability to across the blood-brain barrier, Because of its large size. For this reason, high doses are used to treat brain damage, which leads to extensive side effects. Therefore, the use of this drug is limited. The purpose of this study was design of new Nano drug delivery system for increase the half-life of the drug and reduces the dose of the drug and delivering of EPO to the brain to skip the blood brain barrier. So, anew quaternary ammonium-based cationic Gemini surfactant has been used in this study for preparation of EPO-loaded Gemini micelles. In this study, we studied the physicochemical characteristics of Synthetic Nano drug whit using Dynamic light scattering (DLS) and ζ -potential measurement, Morphology studies and in vitro drug release. The result of this study showed that there are appropriate interactions between EPO and Gemini nanoparticles and EPO loaded in to the Gemini nanoparticles. DLS results and Morphology studies indicate that size of the Gemini-EPO Nano micelle is smaller than 150 nm and Nano micelles (EPO-loaded) having smooth regular surface. TEM micrograph results confirm DLS results sizes of Nano micelles whit were reported between 100-150 nm. On the other hands, in vitro drug release studies indicate that Nano micelles has been degraded and the drug released of Nano micelles into a simulated solution in simulated early-time periods. Also results display decreasing stability structure of Nano micelles (EPO-Gemini) against temperature. In conclusion, the obtained results proposed that Gemini nanoparticles can bind to EPO as a Nano carrier with smooth surface micelles and size of between 100-150 nm. So, Gemini (cationic surfactant can be considered as a candidate for drug delivery (EPO

کلمات کلیدی:

Erythropoietin, blood-brain barrier, Gemini, DLS, TEM, drug release

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