

عنوان مقاله:

Effect of mesoporous silica nanoparticles on the biological systems: interaction with hemoglobin, cytotoxicity assay and drug adsorption

محل انتشار:

پانزدهمین همایش بیوشیمی فیزیک ایران (سال: 1397)

تعداد صفحات اصل مقاله: 1

نویسندگان:

Samira Jafari - *Pharmaceutical Sciences Research Center, School of Pharmacy, Kermanshah University of medical Sciences, Kermanshah, Iran*

Hossein Derakhshankhah - *Pharmaceutical Sciences Research Center, School of Pharmacy, Kermanshah University of medical Sciences, Kermanshah, Iran*

Ali Akbar Saboury - *Institute of Biochemistry and Biophysics, University of Tehran, Tehran, Iran*

خلاصه مقاله:

During recent decades, mesoporous silica nanoparticles (MSNs) due to unique structural properties such as high surface area, large pore size, good biocompatibility and biodegradability, stable aqueous dispersion, have gained much attention for their biomedical applications, especially as an attractive platform in drug delivery. In this scenario, MSNs were fabricated and fluorouracil drug, as an anticancer drug, was subsequently incorporated into the MSNs using an impregnation method to improve therapeutic efficacy of drug. The physicochemical properties as well as cytotoxicity of the prepared nanoformulation were evaluated as well. Since induced side effects of MSNs on the biological system are not well-explored, we herein also evaluated interaction of mesoporous structures with human hemoglobin protein under physiological conditions by fluorescence spectroscopy and circular dichroism (CD) and MTT assay. The fluorescence results demonstrated that MSNs can quench the intrinsic intensity of hemoglobin via a static quenching approach. Furthermore, due to the sign of thermodynamic parameters, the binding affinity of MSNs toward hemoglobin was directly correlated with temperature, illustrating a key role of the hydrophobic forces in the interaction of MSNs with hemoglobin. Besides, the finding of CD analysis confirmed no alteration in the secondary structure of hemoglobin upon attachment to MSNs. The obtained data from MTT assay displayed that cell viability was reduced by the MSNs-induced apoptosis mechanism in a dose and time-dependent manner. According to the obtained results, it could be proposed that investigation of the interactions nanostructures and biological environments .can lead to design and development of efficient novel drug delivery systems

کلمات کلیدی:

Mesoporous silica nanoparticles, Hemoglobin, Drug delivery

لینک ثابت مقاله در پایگاه سیویلیکا:

<https://civilica.com/doc/875277>



