SYNTHESIS AND PURIFICATION OF ALBUMIN-BASED NANOPARTICLES CROSSLINKED BY RADIATION

Reference	Presenter	Authors (Institution)	Abstract
01-102	Fabiane Nunes Riello	Riello, F.N. (Instituto de pesquisas energéticas e nucleares); Varca, G.H. (Instituto de Pesquisas Energéticas e Nucleares); Lima, C.S. (Instituto de Pesquisas Energéticas e Nucleares - Universidade de São Paulo); Freitas, L.F. (Instituto de Pesquisas Energéticas e Nucleares); Ferreira, A.H. (Instituto de Pesquisas Energéticas e Nucleares); Lugao, A.B. (IPEN);	Protein-based nanoparticles have been proved a promissing alternative for the loading and delivery of chemotherapeutic agents, radiopharmaceutics and other drugs of interests, constituting a less toxic therapeutic option due to its biocompatibility and low or null side effects. The use of radiation to crosslink or form covalent bonds enables the controll of the crosslinking process, without the need for crosslinking agents, as well as provides sterilizations simultaneously, withouth generating toxic compounds or products. The present work targets the synthesis an purification of albumin-based nanocarrier crosslinked by gamma radiation for biomedical applications. For such purpose, albumin nanoparticles were synthesized using BSA at 20% ethanol (v/v) in 50 mM phosphate buffer on an ice bath prior to and after irradiation. Samples were exposed to gamma radiation at a minimun absrobed dose of 10 kGy at 5kGy.h-1 and purified using a SuperdexTM 200 Increase 10/300GL for isolating the crosslinked protein (high molecular weight) from the native BSA. After the purification, the fractions were characterized by electrophoresis, Uv, fluorescence and dynamic light scaterring. The nanoparticles were obtained in the range of 25-40 nm and purified into fractions of high molecular weight and the native ones. The high molecular weight fractions presented increased bityrosine levels if compared to the fraction corresponded to the native BSA. The yields of nanoparticle formation remains to be determined, but our results provided a clear evidence of the formation of radiation-crosslinked BSA nanoparticles and the role of bityrosine in the nanoparticle assembly.

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