O59. RADIATION CROSSLINKED ALBUMIN CAPPED GOLD NANOPARTICLES FOR THERANOSTICS

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Gold nanoparticles (AuNP) are being investigated for diagnostic and therapeutic nanomedicines considering their low toxicity and stability against oxidation, among other features. AuNP may be administered site-specifically or intravenously for diagnostic imaging by computed tomography or for therapy [1, 2]. Albumin functionalization of AuNP, whether linked by chemical or physical processes, may provide unique features to the system regarding biopharmaceutical aspects [3]. Recently albumin crosslinking has been studied by radiation induced methods [4, 5]. This work aimed the development of radiation crosslinked bovine serum albumin (BSA) capped AuNP for improved administration of the nanoparticles. For such purpose AuNP were synthesized using 2.5 mM sodium tetrachloroaurate (III) dehydrate and 1 mM resveratrol in water. The mixture was allowed to stand for 12 hours. AuNP capping was performed by BSA addition followed by slow addition of ice-cold ethanol to reach 5 mg mL^{-1} BSA in a 30% (v/v) ethanol solution. The mixture was allowed to rest overnight at ± 4 °C. BSA crosslinking onto AuNP was performed by gamma irradiation [4] at doses of 2.5, 5, 7.5, 10 and 15 kGy. AuNP were synthesized in the range of 60 nm, whereas BSA Capped AuNP presented size over 100 nm, as revealed by dynamic light scattering. AuNP and BSA capped AuNP morphology was evaluated by transmission electron microscopy using negative staining and revealed protein aggregation onto AuNPs and its surroundings. Irradiation led to no shifts in maximum absorbance for both nanoparticles. Protein crosslinking was confirmed by bityrosine and increased with dose. Future steps address biological evaluation of the BSA capped AuNP.

References

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