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SUCROSE ACETATE ISOBUTYRATE BASED NANOGELS AS LIQUID FIDUCIAL TISSUE MARKERS WITH POTENTIAL USE IN IMAGE GUIDED RADIOTHERAPY

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Image-guided radiotherapy (IGRT) is a tool used to enable delivery of high radiation doses to precisely defined targets. In order to fixate the position of tumors, Radiopaque fiducial markers (RFMs) are placed within or near tumors to enhance radiation accuracy. The poster presents the development of injectable RFMs based on coated gold nanoparticles (AuNPs) encapsulated within a secondary medium of sucrose acetate isobutyrate (SAIB), EtOH and polylactide (PLA). Upon injection, the composition forms a fiducial gel-like implant. Three different AuNP coatings were tested; PEG - and PNIPAM polymers and a dithiolane functionalized SAIB derivative. The dithiolane SAIB coating was discarded due to irreversible AuNP aggregation. The PEG-AuNP-SAIB-gel provided high CT contrast *in vivo*; however, AuNP migration was observed over time as well as substantial *in vitro* burst release. The PNIPAM-AuNP-SAIB-gel provided excellent contrast and high stability *in vivo*, and was therefore assessed to be a suitable marker for IGRT.