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Iodine I 124-cRGDY-PEG-C Dots

National Cancer Institute

Source

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An imaging agent composed of silica-based nanoparticles labeled with a near-infrared (NIR) fluorophore, Cyanine 5.5 (Cy5.5) and surrounded by polyethylene glycol (PEG) chains attached to cyclo-[Arg-Gly-Asp-Tyr] (cRGDY) peptides labeled with the positron-emitting radioisotope iodine I 124 via a tyrosine linker, with potential use in positron emission tomography (PET)/spiral computed tomography (CT) imaging. Upon intravenous administration of the radiolabeled iodine I 124-cRGDY-PEG-C dots, the cRGD moiety selectively binds to $\alpha V\beta 3$ integrin expressed on tumor cells. Upon PET/CT imaging, $\alpha V\beta 3$ integrin-expressing tumor cells can be visualized and the degree of both tumor metastasis and sentinel lymph node (SLN) trafficking can be assessed. Integrins are transmembrane glycoproteins upregulated on proliferating tumor vessel endothelial cells and various cancer cells; their overexpression has been associated with neovascularization, differentiation, proliferation of tumor cells, metastasis and an overall poor prognosis.