

U11 Functionalised Luminescent Gold Nanoclusters for Pancreatic Tumor Cells Labelling

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Abstract : Thanks to their ultra-small size, high electron density, and low toxicity, gold nanoclusters (Au NCs) have unique photoelectrochemical and luminescence properties that make them very interesting for diagnosis bio-imaging and theranostics. These applications require control of their delivery and interaction with cells; for this reason, the surface chemistry of Au NCs is essential to determine their interaction with the targeted biological objects. Here we demonstrate their ability as markers of pancreatic tumor cells. By functionalizing the surface of the NCs with a recognition peptide (U11), the nanostructures are able to preferentially bind to pancreatic cancer cells via a receptor (uPAR) overexpressed by these cells. Furthermore, the NCs can mark even the nucleus without the need of fixing the cells. These nanostructures can therefore be used as a non-toxic, multivalent luminescent platform, capable of selectively recognizing tumor cells for bioimaging, drug delivery, and radiosensitization.

Keywords : gold nanoclusters, luminescence, biomarkers, pancreatic cancer, biomedical applications, bioimaging, fluorescent probes, drug delivery

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