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Radiolabeling of substance P with 177Lu and in vivo evaluation of = tumor cell=20 uptake in nude mice: Preliminary = results

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Objectives: This study describes the production of a pure = and=20 stable substance P analog (SP) radiolabeled with Lutetium-177 = (177Lu) and its in vivo biodistribution in Nude mice bearing=20 pancreatic tumor (PT), to verify the viability of this tumor=20 model to predict the specificity of radiolabeled SP to = neurokinin=20 receptors (NKr), usually overexpressed in glial malignant = brain=20 tumors.

Methods: Different radiolabeling conditions were assayed = for=20 obtaining high radiochemical yield of labeled SP. ITLC and = HPLC=20 analysis were applied to determine free lutetium and the = stability=20 of the preparations was evaluated either after storing at = 4=B0C=20 or incubation in human plasma at 37=B0C for 1, 4 and 24 = hours.=20 Biodistribution studies were performed 1 hour post i.v. = injection=20 of radiolabeled SP in AR42J rat pancreatic tumor cell = xenografted=20 Nude mice.

Results: Substance P was successfully labeled with high = yield=20 (>99%) at optimized conditions and kept stable for more = than=20 72 hours at 4=B0C and 24 hours in human plasma. = Biodistribution=20 studies showed that SP excretion was mainly performed by = renal=20 pathway. In addition, 177Lu-DOTA-SP showed an important = uptake=20 by the tumor (~1.0% ID) when compared to normal pancreas = (~0.2%=20 ID), suggesting the presence of NK receptors in AR42J = pancreatic=20 tumor.

Conclusions: The developed model can be applied to = evaluate=20 specific SP uptake by tumor cells. Further investigations are = in development to predict the therapeutical potencial of this = radiopharmaceutical in different tumor models.

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