

**Poster Presentations - Physicians/Scientists/Pharmacists  
Radiopharmaceutical Chemistry Track**

**Evaluation of  $^{99m}\text{Tc}$ -HYNIC-RGD analog in mice bearing lung cancer cells**

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**Objectives:** RGD peptides are promising probes for targetting and binding to  $\alpha_v\beta_3$  integrin, a cell-surface receptor highly restricted in expression to angiogenic vasculature. Cyclization of RGD-containing peptides has been shown to increase both specificity and affinity for defined integrin subtypes. Cyclo[Arg-Gly-Asp-D-Tyr-(HYNIC)-Lys] (RGDdYK) was preliminarily synthesized and conjugated to HYNIC. The aim was to evaluate  $^{99m}\text{Tc}$ -HYNIC-RGD analog in nude mice bearing inoculated lung tumor cells A549.

**Methods:** HYNIC-RGD was labeled with  $^{99m}\text{Tc}$  using tricine/EDDA as coligands. Radiochemical analysis of  $^{99m}\text{Tc}$ -peptide was performed by thin-layer chromatography (TLC) with a two solvent system: Methyl ethyl ketone (MEK) and Acetonitrile 50%. HPLC and SepPak cartridge were also employed. Biodistribution studies were performed in Swiss mice at three times (2, 4 and 24 hours), and image acquisition was documented at 4 hours.

**Results:** Radiochemical purity was  $99.45 \pm 0.12$  %. ITLC findings were confirmed by HPLC with a retention time for the product of 12.86 minutes. Only traces ( $< 0.6$  %) of  $^{99m}\text{TcO}_4^-$  could be detected, with a retention time of 5.33 min. Biodistribution in normal Swiss mice showed very fast blood clearance, with prominent radioactivity in kidneys but with liver uptake as well, reflecting the two elimination routes of the tracer. Good tumor imaging was achieved after 4 hours, and ROI was 2.56%.

**Conclusions:**  $^{99m}\text{Tc}$ -HYNIC-RGD analog was obtained with very high yield, and the biodistribution pattern was confirmed in the animal model, including favorable tumor uptake. Further studies in tumors where integrins are overexpressed should be done, as the compound targets tumor-associated angiogenesis.

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