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Evaluation of Labelling Conditions, Quality Control, and Biodistribution Study of 99mTc- D-Aminolevulinic Acid (5-ALA)

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Abstract : Labeling of 5-Aminolevulinic acid (5-ALA) with 99 mTc was achieved by using tin chloride dihydrate (Sncl2.2H2O) as reducing agent. Radiochemical purity and labeling efficiency was determined by Whattman paper No.3 and instant thin layer chromatographic strips impregnated with silica gel (ITLC/SG). Labeling efficiency was dependent on many parameters such as amount of ligand, reducing agent, pH, and incubation time. Therefore, optimum conditions for maximum labeling were selected. Stability of 99 mTc- 5-ALA was also checked in fresh human serum. Tissue bio-distribution of 99 mTc-5-ALA was evaluated in Spargue Dawley rats. 5-ALA was 98% labeled with 99 mTc under optimum conditions, i.e. 100µg of 5-ALA, pH: 4, 10µg of Sncl2.2H2O and 30 minutes incubation at room temperature. 99 mTc labelled 5- ALA remained stable for 24 hours in human serum. Bio-distribution study (%ID/gm) in rats revealed that maximum accumulation of 99 mTc-5-ALA was in liver, spleen, stomach and intestine after half hour, 4 hours, and 24 hours. Significant activity in bladder and urine indicated urinary mode of excretion.

Keywords : 99mTc-ALA, aminolevulinic acid, quality control, radiopharmaceuticals
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