

# 99MTC LABELLED N-ACETYL NEURAMINIC ACID AS A NEW RADIOTRACER FOR RENAL IMAGING PREPARATION AND PRECLINICAL STUDY

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**M**any ligands such as diethylenetriaminepentaacetic acid (DTPA), glucoheptonate (GHA), a seven-carbon carboxylic acid sugar, glucuronic acid (GA), a six-carbon carboxylic acid sugar bind with reduced radioactive metal <sup>99m</sup>TcO<sub>4</sub><sup>-</sup> (Pertechnetate). These ligands are assessed as radiotracer for nuclear renal imaging to diagnose the various diseases. But this radiotracer takes prolonged time to accumulate in the kidney which results in waiting for long time for the patients' examination. Hence, development of a new renal radiotracer is urgently required to reduce the time for the examination. On the other hand, N-acetyl neuraminic acid (Neu5Ac) is a nine-carbon carboxylic acid monosaccharide (sialic acid) performs multiple functions in living cells. We developed <sup>99m</sup>Tc-radiolabeled Neu5Ac by direct labelling method using SnCl<sub>2</sub>.2H<sub>2</sub>O as a reducing agent. Factors such as amount of Neu5Ac, pH, amount of radioactivity, reaction time and various quantities of reducing agent have been systematically studied to optimize the radiochemical yield of complex. Further, we characterized the developed radio-complex by using various techniques that includes ITLC; paper electrophoresis, HPLC, plasma protein binding, lypophilicity and *in vitro* serum stability at physiological conditions. Investigation of coordinated technetium with Neu5Ac was done by cold rhenium using FTIR. Neu5Ac was successfully radiolabelled with <sup>99m</sup>Tc as evidenced by high labelling efficiency more than 90%, radiocomplex showed partial negative charge as it shifted toward anodic side. *In vitro* stability was 8 hrs in rat serum. Plasma protein binding is 43±3.4% compared to <sup>131</sup>I-OIH, which has protein binding of 44%. Higher accumulation (%ID/g) of radiotracer was observed in kidney, however liver and spleen appears first 15 min and rapidly cleared. Scintigraphic images also reflect the same pattern of radiotracer uptake as observed in bio-distribution studies in rat. Finally this radiocomplex could be converted as new radiopharmaceutical after rigorous quality control in diagnostic role for renal imaging in nuclear medicine field.

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