

# SYNTHESIS OF RHENIUM COMPLEXES AS MODELS FOR NEW SIGMA RECEPTOR IMAGING AGENTS

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## ABSTRACT

The sigma receptor has been biologically found to play roles in the central nervous system (CNS) disorders and cancer cell proliferation. With the identification of lead sigma receptor binding ligands by previous structure activity relationship (SAR) studies, new sigma Tc-99m sigma receptor imaging agents were designed.

Tc-99m imaging agents provide the advantages for routine clinical use due to its ideal nuclear properties ( $t_{1/2}=6$  hours and 140 keV gamma photon emission) and being readily available from a  $^{99}\text{Mo}/^{99\text{m}}\text{Tc}$  generator. The stability, structure, and biodistribution of rhenium complexes have been found similar to their Tc-99m counterparts. Non-radioactive rhenium surrogates serve as a useful precursor for the radioactive Tc-99m imaging agents.

The Re/Tc-99m are bound by the amide-amine-dithiol tetradentate (AADT) chelate and linked onto the sigma moieties following the bifunctional chelate approach. The current study, successfully synthesized the chelate, sigma moieties, and target rhenium surrogates toward the goal of developing new sigma receptor imaging agents.