

Carbohydrate-appended Metal Complexes as Potential Agents in Nuclear Medicine

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This work describes the synthesis and characterization of organometallic complexes of ^{99m}Tc, Re, ¹⁸⁶Re with a series of bidentate and tridentate carbohydrate-appended ligands as analogues of 2-deoxy-2-[¹⁸F]-fluoro-D-glucose (FDG), the most widely used carbohydrate-based diagnostic imaging agent.

FDG, imaged by positron emission tomography (PET), is useful for assessing tissue viability in cardiac patients, imaging brain function, and detecting tumors. The limited availability and significant expense of PET technology, combined with the relatively short half-lives of PET emitters such as ¹⁸F, have, however, stimulated a search for alternatives to FDG. The use of radionuclides (e.g. ^{99m}Tc) that decay by a process that can be imaged by single photon emission computed tomography (SPECT) is being investigated. SPECT is much more prevalent and allows for the use of a radionuclide such as ^{99m}Tc which has ideal nuclear properties, and is widely found and used in the health care industry. Interest in ¹⁸⁶Re analogues for therapeutic nuclear medicine is naturally concomitant.

The preparative chemistry as well as labeling studies, *in vitro* stability, and initial biological results will be presented.