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Title of presentation: Radioactive mercury, a tool for cancer imaging and treatment.

Abstract

Nuclear medicine is a growing area of study that exploits the chemical properties of radioactive species for the diagnosis and treatment of disease. A “theranostic” in nuclear medicine is based on using a chemically identical radiopharmaceutical for both imaging and therapy. Mercury-197m/g is a potential theranostic radiometal; it decays through gamma-ray (γ) emission that can be used for diagnosis, as well as Auger electron emission that can be used for therapy. For targeting to diseased tissues, it will be bound to a ligand (metal-bound molecule), which is attached to a biomolecule specific for diseased tissues. It is hypothesized that a previously reported ligand, used for mercury detection, could be ideal for binding radioactive mercury-197m/g. The ligand was synthesized using organic chemistry techniques and a complex of it, and non-radioactive mercury was successfully formed. Radiolabeling of the ligand to radioactive mercury-197m/g is in the process of being optimized.