Public Abstract
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Title:Synthesis and Evaluation of Rhodium(III)-105 Complexes Derived From Diaminodithioether (DADTE)Ligands

Therapeutic radiopharmaceuticals are drugs designed to destroy the cancer cell with ionizing radiation. Unlike conventional chemotherapy and radiation therapy, therapeutic radiopharmaceutical destroys the cancer cells selectively without damaging the normal tissue. These radiopharmaceuticals can be small organic/inorganic molecules or they could be antibodies, peptides or hormones that have a radioisotope attached to them. In this project a potential peptide based radiopharmaceutical was designed and synthesized. This radiopharmaceutical involved a specially designed peptide Bombesin(7-14) that can directly recognize various cancer cells (e.g., small lung, breast and prostate cancers). 105Rhodium (a radioactive isotope of the element rhodium) was used as a radiation source due to its ideal nuclear and chemical properties. To attach the Rhodium-105 to the peptide, a chemical compound (acyclic diaminodithioether) was used. In order to find the ideal ligand for Rhodium-105, several analogues of acyclic diaminodithioether ligands were synthesized and their Rh(III) complexes were prepared and analyzed. The coupling studies of the optimum acyclic diaminodithioether ligand to the Bombesin(7-14) was accomplished. Finally, the attachment of the Rhodium-105 was performed to obtain the potential peptide base radiopharmaceutical.