

Radioactive Metal Complexes as Agents for Positron Emission Tomography

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The field of positron emission tomography (PET) has expanded dramatically over the last decade. The number of centers carrying out clinical PET has increased well over 200 in the United States. Many new radiolabeled compounds are being investigated as imaging agents. These include agents labeled with the positron emitting radionuclides ^{45}Ti , ^{60}Cu , ^{61}Cu , ^{64}Cu , ^{66}Ga and ^{86}Y . These radionuclides have half-lives ranging from 20 min (^{60}Cu) to 16 h (^{86}Y). Several of these nuclides (^{64}Cu , ^{66}Ga and ^{86}Y) can be delivered to imaging centers from a central production facility. All of these radionuclides can be produced on small biomedical cyclotrons that are being installed in hospitals and distribution facilities largely to distribute the radionuclide ^{18}F . Techniques to the high yield production of all of the nuclides listed above have been developed.

Small molecules, peptides and antibodies have been labeled with the metal radionuclides. Agents to image tissue hypoxia, tissue receptor status, as well as tumor antigen levels, are being evaluated in animal models and in human populations.

Evaluation of new radiolabeled agents has been simplified by the development of high resolution small animal PET scanners that are now commercially available. The applications of these scanners in the evaluation of new radiopharmaceuticals will be discussed.

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