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To-99m(Sn)PYRIDOXYLIDENEPHENYLALANINE AND ITS LIPOPILIC DERIVATIVES; AN APPROACH TO STRUCTURE/BIO-DISTRIBUTION RELATIONSHIP OF TECHNETIUM COMPLEXES. M.Kato-Azuma and M. Hazue. Technical Dept. NIHON-MEDI-PHYSICS CO., LTD. Takarazuka, Hyogo.

The objective of our current research was to evaluate the structure/bio-distribution relationship of To-99m(Sn)pyridoxylidene-phenylalanine derivatives, and to find a hepatobiliary imaging agent with rapid blood clearance, quick hepatobiliary transport and low urinary excretion. Phenylalanine derivatives with hydrophobic substituents on their aromatic ring were used for the preparations; they were o-F, m-F, p-F, p-Cl, o-methyl, p-methyl, m,m'-dimethyl and p-isopropyl-phenylalanine (all in DL form). The lipophilicity of the To-complexes was evaluated with the measurement of their n-octanol/buffer partition coefficient, and their in vivo distribution was studied in rats and rabbits. The amount of urinary excretion correlated well with the lipophilicity of the complex; the increase in lipophilicity diminished urinary excretion. The rate of blood clearance and hepatobiliary transport, on the other hand, reflected the structure of the complexes; the ortho-substituents were quite effective in accelerating blood clearance and hepatobiliary transport, and the opposite results were observed with the para-substituents. These results could be understood with consideration of the structure of the complexes with special attention to lipophilicity and rigidity of the molecules.


Factors causing lung uptake of To-99m tin colloid are the patient's physiological condition, the techniques of labeling and the particle size of the tin colloid. The purpose of the present study is to investigate the effects of shaking and ionic concentration on the particle size of To-99m tin colloid.

Vials filled with To-99m tin colloid were shaken with a repeating stroke of 20 mm at a rate of 90 strokes/min. The To-99m tin colloid was injected into rats at specific time intervals after shaking to determine liver and lung uptake. With 3 hr of shaking we observed a significant decrease of liver uptake and an increase of lung uptake. Whereas, liver uptake showed no significant change up to 2 hr without shaking. The optimum saline concentration for stabilization of To-99m tin colloid under shaking condition was found to be 0.3%.

The volume of the dead space in the vial was found to be the most effective factor in controlling the stability of To-99m tin colloid. Based on this finding, we designed the sliding gasket vial to eliminate the dead space, therefore, preventing the aggregation of colloidal particles. This enabled us to maintain a liver uptake of over 90% after 17 hr after shaking.

QUALITY CONTROL OF RADIOPHARMACEUTICALS—EVALUATION OF RADIOACTIVE IMPURITIES IN RADIOPHARMACEUTICALS. H. Mori, K. Hisada, R. Amano and A. Ando. Department of Nuclear Medicine, School of Medicine and School of Paramedicine, Kanazawa University. Kanazawa.

Radioactive impurities in 11 radiopharmaceuticals have been studied using a pulse-height spectra with a Ge(Li) spectrometer. Some impurities have been found in the radiopharmaceuticals of I-123, T1-201, In-111 and Rb-81-Kr-81m generator. The whole-body absorbed radiation dose from these radioactive impurities was calculated by MIRD procedures. The results suggest that these impurities offer no problem, in terms of the radiation dose and clinical utility. However, because In-114m and Rb-83, namely, the impurities contained in In-111 and Rb-81, respectively, have a long half-life, it has to be paid attention to release of these radioactive waste.