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EVALUATION OF I-123 HIPDM AS A PANCREAS IMAGING AGENT. K. Yamamoto, Y. Kuge*, H. Saji, T. Shibata, N. Hayashi, E. Aoki, M. Senda, S. Nishizawa, Y. Yonekura, and K. Torizuka**. Kyoto University School of Medicine, Pharmaceutical Sciences*, kyoto and Fukui Medical College**, Fukui.

We have already reported the pancreas accumulation of radioiodinated HIPDM in mice and rats, which was originally developed as the brain perfusion imaging agent by Kung et al.. In this study, we have tried to evaluate the I-123 HIPDM as a human pancreas imaging agent.

About 3 mCi of I-123 HIPDM was given to the normal volunteers and patients with pancreatic diseases intravenously at the fasting state or after meal.

In the normal cases, pancreas was visible in the planar image from 3 hours and more clearly visualized at 20 hours after administration. Radioactivity in the intestinal tracts was higher in the case given at the fasting state than cases given after meal. SPECT could avoid overlapping the activity in the liver and spleen with that in the pancreas, and thus good images of pancreas could be obtained at 3 hours after injection. Pancreas cancer did not accumulate I-123 HIPDM and a case with chronic pancreatitis and pancreatolithiasis did not show the pancreatic uptake of I-123 activity in the SPECT image at 3 hours.

I-123 HIPDM was expected to have clinical potential as the pancreas imaging agent.

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Cu-62 LABELED AMINE COMPOUNDS USING BIFUNCTIONAL CHELATING AGENT FOR PANCREAS STUDY: BASIC STUDIES WITH Cu-64. H.Saji, Y.Kuge, T.Hosotani, Y.Arano, A.Saiga and A.Yokoyama. Fac. of Pharm. Sci. & Sch. of Med., Kyoto Uni., Kyoto.

The development of radiopharmaceuticals for pancreas study is most desirable. In our previous work, some amine compounds such as N-13-ammonia, I-123-HIPDM and its derivatives, have shown high pancreatic accumulation. In further research, since some amine derivatives based on the notion of bifunctional radiopharmaceutical have been developed, our interest was directed to the procurement of pancreas radiopharmaceuticals labeled with Cu-62, aware of the recent plausiblity of generator produced, Cu-62, a positron emitter. In the present work, a N,N-dimethylphenylethylamine analogue (p-DPA-DTS) containing a di(N-methylthiosemicarbazone) as the metal coordinating site was synthesized and radiolabeled by mixing Cu-64-copper acetate. In vivo biodistribution study in rats showed high Cu-64 radioactivity accumulation in pancreas and low uptake in liver shortly after i.v. injection. Therefore, proper target/non-target ratio of 2.6 at 2 min after injection, for the pancreas imaging was obtained. Thus, the biological functionality of the amine group was also well represented in the new Cu-62-p-DPA-DTS offering good bases for using bifunctional radiopharmaceutical in PET study of the pancreas.

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DISTRIBUTION OF La AND Tb IN SUBCELLULAR FRACTIONS OF RAT LIVER. S.Sanada, A.Ando and T.Hiraki. School of allied medical professions, Kanazawa University, Kanazawa.

We have examined the distribution of radioactive inorganic compounds (55 elements and 122 compounds) in rat. In lanthanoid,Yb and Tm were previously reported. The present study was performed to determine the retention values and subcellular distribution of La and Tb in rat liver by Instrumental neutron activation analysis.

Ten μg of La and Tb (0.08M sodium citrate solution, 25μg La,Tb/ml) were injected intravenously into the rats. These rats were killed at 3, 24 and 48hrs after the administration of them. These livers were excised and weighed portions of each were homogenized in cold 0.25M sucrose containing 0.01M Tris-HCl buffer, pH 7.6. Fractionation was carried out according to the modified method of Hogeboom and Schneider, and fractionated samples were lypophilized. Irradiation lasted 40 min in the JRR-4 (Toukai, Japan) with a flux of thermal neutrons of 8×10^{13} n/cm^2·sec. Lanthanum-140 and Tb-160 in the irradiated samples were counted by Ge(pure) detector after 2-7days of cooling.

It is shown that both La and Tb were transported from supernatant fraction to mitochondrial fraction. These results agree approximately with those of Yb and Tm. It is analogized from Yb and Tm that La and Tb were bound to acid mucopolysaccharides in liver and transported to lysosome contained in the mitochondrial fraction.

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Tc-99m LABELING OF DITHIOSEMICARBAZONE (DTS) LIGANDS BY LIGAND EXCHANGE. **Y.Arano, T.Yahata, S.Yabuki and A.Yokoyama. Faculty of Pharmaceutical Sciences, Kyoto University, Kyoto.**

We have reported the excellent properties of DTS as the Tc-99m chelating site for the bifunctional radiopharmaceuticals. However, Tc-99m labeling in aqueous medium have shown some hydrolyzed products, and labeling only in the reduced aqueous medium has offered high labeling efficiency. These results may be due to the rapid hydrolysis of Tc-99m in aqueous medium, and the presence of week ligands may help Tc-99m from hydrolysis and prefer Tc-99m to complexation with DTS. Thus, in the present studies, using kethoxal-bis(thiosemicarbazone) (KTS) as a model, Tc-99m labeling of KTS in aqueous medium was carried out by ligand exchange reaction.

Citrate, glucoheptonate or tartrate at varying concentration were labeled with Tc-99m, then mixed with the KTS solution at varying pH. The labeled products were analyzed by thin layer chromatography and mice biodistribution. Tc-99m labeling efficiency was affected by the reaction pH and type and concentration of ligands. Tc-99m labeling of KTS in the presence of citrate at near neutral pH offered the product of almost identical properties with those of Tc-99m-KTS labeled in ethanol.

These results indicated the potentiality for labeling DTS ligands in aqueous medium by the presence of week ligand. Further related studies are now in progress.