of time. One of two types was considerably less stable, especially that of DMA_2(70h : CoA_2 50/50 CoB_2 56/44 $CoDMA_2$ 91/9) was unstable.

^1H NMR spectrum of the Co-$BLMA_2$ (solvent : D_2O 60MHZ)was compared with that of $BLMA_2$.

Intracellular State of Tumor-Radionuclides: Determination of Intracellular Gallium with X-ray Microanalyzer (EDAX). First Report

Yumiko SASAKI, Hirotake ORII and Akira TANAKA
Department of Radiology and Nuclear Medicine, Tokyo Metropolitan Institute of Medical Science

Intracellular distribution of radionuclides with tumor affinity, sich as gallium, was detected, identified and semiquantitatively determined with energy-dispersive X-ray microanalyzer (EDAX). The first attempt was to obtain ultrathin samples containing gallium in native state, i.e., without any artificial changes which occures during fixation with liquid agents such as uranyl acetate or glutaraldehyde. To overcome these drawbacks, liver and tumor was dissected in frozen state under liquid nitrogen with LKB 8800 ultramicrotome. The thin sections obtained were vacuum-dried in cupper meshes before placing in scanning electron-microscope Hitachi S-500. In SEM, samples were scanned to obtain transmission images, and electron-microbeam was irradiated to the selected sites, to obtain characteristic X-ray spectrum with EDAX model 711. The spectrum was displayed on CRT, and underwent computer processing to EDAX program. The program includes smoothing, subtraction of special peaks of a certain element (interfering co-existing elements) and quantitative estimation of element in problem.

Our system revealed, however, its sensitivity inadequate to demonstrate elements injected at sublethal level and, experiments in such a condition inevitably lead to enrichment of elements to toxic levels. To overcome these drawbacks, an attemp to increase system sensitivity was carried out by putting silicon detector at shorter distance from sample. At present, estimation of sensitivity increment is in progress.

Experimental Studies on Mechanism of ^{201}Tl Uptake

Yasuhiko ITO, Akira MURANAKA, Tsuneo YOKOBAYASHI and Hideaki TERASHIMA
Division of Nuclear Medicine, Department of Radiology, Kawasaki Medical School

The tumor affinity of ^{201}Tl was studied with normal and VX-2 cancer-bearing rabbits. As a result it was found that ^{201}Tl-clearance from blood was quite rapid, showing a similar tendency as ^{42}K.

^{201}Tl distribution in normal rabbit tissues was greatest in the kidney and heart muscle followed by the thyroid gland, small intestine, spleen, lung, liver, bone marrow, bone, skeletal muscle, and blood in the order mentioned. The accumulation into the thyroid varied greatly according to individuals, generally the taller was the height of follicular cells, the greater was the affinity.

The accumulation of ^{201}Tl into the tumor transplanted into femoral muscle reached its maximum within one hour after its daministration, therer after it decreased gradually.

When the tumor affinity was compared with that of ^{67}Ga, the ratio of ^{67}Ga accumulation into tissues except blood was greater than that of ^{201}Tl.

The accumulation of ^{201}Tl was significantly correlated to that of ^{42}K, and the mechanism of ^{201}Tl-tumor affinity seemed to be triggered by the acceleration of potassium metabolism of tumor.

As the reasons why ^{201}Tl is an excellent agent in clinical diagnosis of thyroid cancer, a marked

Presented by Medical*Online

deposition of the label in the glandular and proliferative tissues, an increase in the contrast of tumor to thyroid ratio due to a wide variety of ^{201}Tl-uptake in the thyroid tissue, and the improvement of image due to a marked decrease of ^{201}Tl within cervical blood pool may be pointed out.

The accumulation into inflammatory focus was greater with ^{67}Ga in the ratio to muscle, while the ratio to blood was greater with ^{201}Tl.

Tumor Scintigraphy with Tl-201 Chloride

Seiichiro MORITA, Seiichiro IKEDA, Atsuyoshi KUDO, Yasuto FURUKAWA, Noriyoshi UMEZAKI, Kiyoshi YANO, Akira KONO and Hisashi OHTAKE
Department of Radiology, Kurume University, Scholo of Medicine

We studied tumor scintigraphy using various nuclides and reported on various occasion. We attended to Tl-201 chloride which developed for myocardial perfusion agent and tried to lablled it to Bleomycin. But the labelling arrived at unsatisfactory result. We noticed that Tl-201 chloride was tumor affinity agent and used in clinical study. We obtained satisfactory result in tumor scintigram with Tl-201 chloride.

Before clincial application, the uptake of Tl-201 chloride in rat Ehrlich's ascites carcinoma implants was investigated in a pilot study. The animals were injected with 10 μCi of Tl-201 chloride intravenously via a tail vein and sacrificed 10, 30, 60 min 4 hrs after injection. The Tl-201 chloride concentration in tumor, liver, myocardium, pancreas, spleen, kidney and blood was determined.

In clinically, we injected a 2 mCi dose of Tl-201 chlorides into cubital vein of the patients with malignant neoplasm such as lung cancer, malignant struma, brain tumor, gastric cancer, malignant lymphoma, and skin cancer. A total of 91 cases were performed scintigram immediately, 1, 2, 3, 4, 6 and 24 hrs after injection. In certain cases, we carried out scintigraphy with Ga-67 citrate and Hg-197 chloride for the comparison with Tl-201 chloride.

The following result are obtained.

1) The Tl-201 chloride concentration rate in tumor tissues was about 1% per total injected dose in experimental animals. This rate is not so different comparing with Ga-67 citrate and Hg-197 chloride.

2) The positive rate in scintigram is 74.2% in all cases with malignant neoplasm. Especially, the high average were obtained in malignant struma and lung cancer.

3) Tumor scintigraphy was able to practise immediately after injection.

4) Comparing with the image of Ga-67 citrate and Hg-197 chloride, we experienced some cases that the image of Tl-201 chloride was better than of Ga-67 citrate or Hg-197 chloride.

^{201}TlCl for Head and Neck Fumor Scanning

T. OGOSHI*, M. MAKINO*, Y. NAGOSHIO, N. USUI*, A. TAKASU**, U. MARUYAMA***, H. KUROSAWA*** and T. TOBARI***
**Department of Oforhinolaryngology, Toho University School of Medicine,*
***Department of Oforhinolavyngology Fujita Gakuen University*
****Department of Radiology Toho University School of Medicine*

Studies and development of radiopharmacenticals having affinity for malignant tumors are being carried on, but we have no satisfacotry drug at present. We used ^{201}Tl-Chloride for the purpose of treating 11 cases of cephalocervical tumors and made a scanning study. The results are presented here.

Each patient was intravenously given 2mCi

Presented by Medical*Online