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THE EFFECT OF THE ADMINISTRATION OF IRON ON Ga-67 UPTAKE IN TUMOR CELLS. H.Wakao and T.Higashi. Department of Radiology, Kanagawa Dental College. Yokosuka

In previous paper, we reported that the accumulation of Ga-67 into tumor cells may be less susceptible to exchange with iron loading.

The present investigation was, furthermore, undertaken in order to study the relationship between Ga-67 metabolism in tumor cell and iron loading.

At first, the Ehrlich tumor cell which accumulated Ga-67 was intraperitoneally injected in mice bearing Ehrlich ascites. Subsequently, the Ga-67 kinetics in these tumor cells by iron loading was studied. In addition to, the uptake of Fe-59 in these tumor cells was measured. The kinetics of Ga-67 in the tumor cells was less susceptible to exchange with iron loading or without iron loading. Furtheremore, the greater part of the eliminated Ga-67 was excreted from the ascites, in contrast, was very little from the tumor cells.

From these results, the authors postulate that the localization or binding substance of Ga-67 in tumor cells is different from that of iron.

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STUDIES ON GA-67 UPTAKE BY TUMOR CELLS USING MICROAUTORADIOGRAPHY. S.Nakano, Y.Hasegawa, S.Ishigami. The Center for Adult Diseases, Osaka.

During the studies on Ga-67 uptake by ascites tumor cells (AH 130) using microautoradiography, we found that grains had been detected without incubation with Ga-67. It is, therefore, difficult to discriminate the specific grains due to Ga-67 from the non-specific ones. The tumor cells were smeared, dried, and fixed with methanol. The specimens were dipped in the emulsion (NR-M2, Konishiroku Co.) for microautoradiography. After development and fixation they were stained with Giemsa. Black or brownish grains with various sizes are found in the cytoplasm of the cells but the size is uniform in each cells. They are not found in smeared cells from subcutaneous tumors, livers, spleens, or bone marrows. The facts that the non-specific grains do appear even by several hours after the dipping and the ferriferricyanide staining does show granules similar to the non-specific ones lead us to the assumption that the non-specific grains seem to be caused by some reducing substances. The coverage of the specimens with collodion film before dipping the specimens in the emulsion is found to prevent the appearance of the non-specific grains. In order to study Ga-67 uptake by AH 130 using microautoradiography it is found that the coverage of specimens with thin film is necessary to detect the specific grains.

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MORPHOLOGICAL STUDAY OF DISTRIBUTION OF GA-67 CITRATE IN 3'-METHYL-4-DIMETHYLAMINOAZOBENZEN-INDUCED HEPATOMA OF RATS. S.Kikuchi, S.Morita,R.Dannoura,T.Okinaga,N.Umezaki,K.Yano,H.Ohtake. Kurume University, School of Medicine, Kurume.

The distribution of Ga-67 citrate in hepatoma of rats induced by 3'-methyl-4-dimethylaminoazobenzen(3'-Me-DAB) was studied autoradiographycally and histologically. Ga-67 citrate(3.7 MBq/Kg) was administered in abdominal cavity of rats. After 48 hr, gallium scintigraphy was performed and the animals were killed. Ga-67 uptake ratio, resected specimen, autoradiography(Ga-67-citrate and H-3 thymidine) and histologically specimen(Hematoxylin Eosin stain,Azan stain and Alcian blue stain) were compared each other. Ga-67 uptake ratio of the tumor was increased 1.6 to 7.2(average 4.4) to control group. Regardless of the size of the tumor, the distribution of Ga-67 citrate macroautographycally in the hepatoma was higher in the peripheral zone than in the central zone. The distribution of H-3 thymidine was identical to that of Ga-67 citrate. Histologically the degeneration of tumor cell was low or absent in the peripheral zone of the tumor, whereas it was intence in the central zone. Ga-67 citrate was highly accumulated in the zone which the degeneration was low or absent.

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SUBCELLULAR DISTRIBUTION OF Ga-67 IN NORMAL ORGANS. I.Ando,A.Ando,T.Hiraki and K.Hisada . Kanazawa Unversity. Kanazawa

We already reported that large amounts of Ga-67 were accumulated in liver lysosome, but only a small amount of Ga-67 were accumulated in tumor lysosome. This study was undertaken subcellular distribution of Ga-67 in the organs described below.

Ga-67 citrate was injected to the normal rats. Ten min, 1, 3, 24 and 48 hrs after the administration of Ga-67, kidney, heart, lung, pancreas, spleen, stomach and muscle were excised. These organs were homogenized and subcellular fractionations were carried out according to the modified method of Hogeboom and Schneider. Fractions from the centrifugation were assayed for Ga-67.

In muscle and stomach, large amounts of Ga-67 were in supernatant, and Ga-67 in each fraction was not varied with time. In kidney and lung, Ga-67 in mitochondrial fraction (lysosome is contained in this fraction) increased obviously with time, but Ga-67 in supernatant decreased with time. And Ga-67 in nuclear fraction increased with time. In spleen, Ga-67 in mitochondrial fraction and nuclear fraction increased with time, but Ga-67 in microsomal fraction decreased. In heart, Ga-67 in mitochondrial fraction and microsomal fraction increased with time. In pancreas, Ga-67 in mitochondrial fraction increased with time. In heart and pancreas, Ga-67 in supernatant decreased with time. Subcellular distribution of Ga-67 demonstrated features of each organ, as is mentioned above.