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THE ROLE OF IRON ON THE ACCUMULATION OF GALLIUM. K.Nakamura & H.Orii. Tokyo Metropolitan Institute of Medical Science.

The role of iron on the accumulation of gallium in tumor cells has been discussed from three points of view. (1) Binding proteins of gallium are iron proteins, including trasnferrin, loctoferrin(?) and ferritin(?). (2) Characteric gallium scintigraphies are obtained in the case of anaemia or by treatment which causes the change of unsaturated iron-binding capacity (UIBC) in serum (e.g., whole body irradiation). (3) Ga-citrate polymer, which is said to be one of factors to affect the accumulation of gallium in the cell (refer to 94) is similar to Fe-polymer in the point of inorganic chemistry.

In order to investigate the correlation between gallium and iron, gallium citrate was injected to mice, and the distribution of iron in tissues was studied. The correlation between content of gallium and iron have been found in some tissues. It is also suggested that the distribution of iron in tissue is affected by the injection of gallium citrate. According to our experimental results and works of others reported so far, we will discuss the role of iron on the localization in vivo of gallium.

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DYNAMIC STUDY OF GA LOCALIZATION IN LIVER CELLS. K.Samezima, K.Komine & H.Orii. Tokyo Metropolitan Institute of Medical Science.

A time-course study of Ga-67 in vivo in rat liver cell, its terminal localization and carrier protein determination was performed using isopycnic rate-zonal ultracentrifugation method previously reported. The liver homogenate was fractionated by this method, and distribution of Ga in every fraction was measured at 30 min, 6 hrs ad 24 hrs post injection. At 30 min, Ga was localized in the supernatant, the peak at 5 s. at 6 hrs, Ga was moved to lysosomes, and no participation of endoplasmic reticulum was confirmed, as was studied by marker enzymes. A careful study revealed the presence of two different kind of lysosomes having a different density, a novel finding.

At 24 hrs Ga was concentrated in lysosomes. The distribution in two lysosomal compartment was equal. No incorporation in cell nuclei was found. Analysis of carrier protein revealed the presence of 100,000 mw protein in the supernatant which disappeared during 24 hrs. Destruction of lysosomes resulted in lease of free Ga and high molecular wt peak. These results indicate; 1. Ga-binding substance of 100,000 mw is present in the cell. 2. This is not ferritin, and we suggest that it is transferrin. 3. No protein bound Ga inlysosomes. We assume that Ga is bound to lysosomal membrane.

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Ga-67 ACCUMULATION AND Ga-67 BINDING SUBSTANCES IN LIVER. A. Ando, T. Hiraki, I. Ando and K. Hisada. Schools of Paramedicine and Medicine, Kanazawa University. Kanazawa.

It is known that Ga-67 is accumulated in lysosome in liver. In this experiment, Ga-67 citrate was injected to the mouse and liver was excised at 24 hours after injection. Subcellular fractionation of the liver was carried out according to the method of Hogeboom and Schneider. Mitochondrial fraction (lysosome was contained in this fraction) was incubated with pronase P in pH 8.0 solution at 37°C for 24 hours. After digestion, the reaction mixture was gelfiltered on sephadex G-50 and G-100. Eluate samples were collected in an automatic fraction collector and assayed for Ga-67, acidic mucopolysaccharide and protein. On the other hand, after digestion with pronase P, the reaction mixture was incubated with RNase and DNase. After that, the reaction mixture was gelfiltered on Sephadex G-50 and assayed for Ga-67, acidic mucopolysaccharide and protein. In these experiments, the most part of Ga-67 was eluted with acidic mucopolysaccharide. And it was cleared that Ga-67 was bound to acidic mycopolysaccharides. From the above-mentioned facts, it is presumed that Ga-67 is bound to the acidic mucopolysaccharides in the liver.

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In-111 ACCUMULATION AND In-111 BINDING SUBSTANCES IN LIVER. I. Ando, K. Hisada, A. Ando and T. Hiraki. Schools of Medicine and Paramedicine, Kanazawa University. Kanazawa.

It is known that In-111 is accumulated in lysosome in liver. In this experiment, In-111 citrate was injected to the rat and liver was excised at 24 hours after injection. Subcellular fractionation of the liver was carried out according to the method of Hogeboom and Schneider. Mitochondrial fraction (lysosome was contained in this fraction) was incubated with prosase P in pH 8.0 solution at 37°C for 24 hours. After digestion, the reaction mixture was gelfiltered on Sephadex G-50 and G-100. Eluate samples were collected in an automatic fraction collector and assayed for In-111, acidic mucopolysaccharide and protein. On the other hand, after digestion with pronase P, the reaction mixture was incubated with RNase and DNase. After that, the reaction mixture was gelfiltered on Sephadex G-50 and assayed for In-111, acidic mucopolysaccharide and protein. In these experiments, the most part of In-111 was eluted with acidic mucopolysaccharide. And it was cleared that In-111 was bound to acidic mucopolysaccharides. From the above-mentioned facts, it is presumed that In-111 is bound to the acidic mucopolysaccharides in the liver.