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DISTRIBUTION OF Ga-67 IN ABSCESS:OBSERVATION BY MACROAUTORADIOGRAPHY.
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The present study was undertaken to investigate relation between the distribution of Ga-67 in abscess and the time after subcutaneous injection of turpentine. At various times afterwards, ranging from 2 days to 10 days after subcutaneous injection of 0.2 ml turpentine to the rats, Ga-67 citrate was injected to the rats. Twenty-four hours after injection of Ga-67 citrate, abscess was excised and frozen immediately after excision in the cryostat (-20°C). After this, the frozen tissues were cut into serial thin sections(10 um) in the cryostat. One of these sections was then placed on X-ray film and this film was developed after exposure of several days, and second section was stained with hematoxylin-eosin.

From the obsevation of the autoradiograms and the stained sections, the following results were obtained. In the case of abscess excised at 2 days after injection of turpentine, concentration of Ga-67 was predominant in areas in which large amounts of neutraphils were seen. But, in abscess obtained at 5 days after injection of turpentine, concentration of Ga-67 was more dominant in areas in which infiltration of macrophages was seen, than in above area.

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GA-67 BINDING TO HEPARAN SULFATE PROTEOGLYCANS IN MICE LIVER.
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Our previous attempts to elucidate the mechanism in the variety of organic disease models, led us to considered that heparan sulfate (HS), a kind of glycosaminoglycans (AMPS), is related to Ga-67 accumulation in tumor tissue and inflammatory lesions. It is known that almost of the AMPS containing HS were present as protein-polysaccharide complex or proteoglycans in vivo. We investigated the binding of Ga-67 to sulfated proteoglycans with Sepharose CL-4B column-chromatography in guanidine hydrochloride.

Ga-67 were bounded to two types of sulfated proteoglycans (an average molecular weights; 1,800,000 or 35,000) in the normal liver. These sulfated proteoglycans fractions which involved Ga-67 activities were shifted to lower molecular weight fraction (about 10,000) by the papain treatment. Moreover, Ga-67 involved in this fraction was shifted to the free Ga-67 fraction by the treatment of nitrous acid. Ga-67 were also bounded to two types of sulfated proteoglycans in the damaged liver induced by CCl_4. However, these Ga-67 radioactivities in the large molecular weight fractions were higher than those in the normal liver. Fe-59 was not bounded to the sulfated proteoglycans and its gel filtration pattern was evidently differed from that of the Ga-67.

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EFFECTS OF CITRATE AND PH ON GA-67 BINDING TO LIVER AND TUMOR CELLS.
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Previously, we have been reported that the binding of Ga-67 to the normal liver cells was affected by various basal factors in the incubation medium in vitro. Namely, the Ga-67 binding to the normal liver cells was affected by the change of pH in the incubation medium. At low citrate concentration in the medium, the Ga-67 binding to the cells decreased as pH was increased. However, at high concentration of citrate in the medium, the Ga-67 binding to the cells was gradually elevated with increasing pH. In the present study, Ehrlich ascites tumor cells(ETC) were used as a different type of cells from normal liver cells, and the effects of citrate and pH on the Ga-67 binding to the ETC were examined. The ETC were harvested from the mice 10 days after i.p. injection of $1x10^7$ cells. The Ga-67 binding to the ETC was inhibited by citrate in a dose dependent manner. The effect of pH on the Ga-67 binding to the ETC was similar to the results that obtained from the liver cells. These results indicate that the changes of citrate concentration and pH in the incubation medium may affect to the chemical form of gallium in vitro.

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COMPARATIVE STUDIES ON KINETICS OF GA-67-CITRATE, FE-59-CITRATE AND I-125-TRANSFERRIN IN CULTURED CELLS.
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In the accumulation mechanisms of Ga-67-citrate (Ga) in tumors, the mediation of transferrin (Tf) is being emphasized. In present studies, the kinetics of Ga, Fe-59-citrate (Fe) and I-125-Tf (I-Tf) in cultured cells were compared. Ga uptake by HeLa S3 increased with time laps at 37°C, but not occurred at 4°C. Only a small amount of Ga was excreted from the cells. On the other hand, I-Tf was taken up similary at 37°C and 4°C, and excreted markedly from the cells at 37°C. However, the excretion of I-Tf taken up at 37°C decreased at 4°C. From these results, it is indicated that Ga is internalized into the cells in the form of a Tf-Ga complex through the receptor mediated endocytosis and Ga separated from the complex is retained in the cells and that Tf is released from the cells. I-Tf-Fe and I-Tf-Ga had a higher binding affinity to Tf receptor than I-apo Tf. However, Ga uptake by the cells differed from Fe and I-Tf uptake depending upon the various kinds of cultured cells. Therefore, the kinetics of Ga in the cells are affected by factors being different from those related to Fe uptake.