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THE EFFECT OF THE ADMINISTRATION OF IRON ON GA-67 UPTAKE IN EHRLICH ASCITES TUMOR.
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In our previous paper, we reported that iron loading post Ga-67 injection leads to Ga-67 excretion from the tumor and normal soft tissue. The aim this experimental work was to study, in vivo, the effects of ferric citrate on Ga-67 egress from Ehrlich ascites cell and ascites in tumor bearing mice. This study was undertaken in attempt to disceren the cause of whether Ga excretion is intracellular or extracellular.

16 hours after Ga-67 injection in mouse bearing Ehrlich ascites, ferric citrate(0.1 mgFe) was administered. The Ga-67 uptake of tumor cells and ascites 6 hours post iron loading was measured. The rate of Ga-67 egress is much faster from ascites than from Ehrlich cells. Furtheremore, the greater part of the eliminated Ga-67 was excreted from the ascites, in contrast, was very little from Ehlich tumor cells. From these results, the authors postulate that the Ga-67 that has already entered tumor cells may be less susceptible to exchange with iron loading.

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THE EFFECT OF THE ADMINISTRATION OF IRON ON GA-67 UPTAKE IN ANIMAL TUMOR.
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There are many papers concerning the change of Ga-67 accumulation in experimentaltumor by administration of iron before and after Ga-67 injection.

This study was undertaken in attempt to discern what change were produced in Ga-67 images of tumor-bearing rabbit(VX-2) when iron was administered after Ga-67 injection. 24 hours after Ga-67 injection, ferric-citrate(20mg) was administered in tumor-bearing rabbit(VX-2).

The Ga-67 activity in blood following injection of iron was measured, in addition , the change of whole-body image with scintillation camera was taken. This iron injection leads to an elevated excretion of Ga-67 and to an increase in the deposition of Ga-67 in bone. At the same time, the uptake of tumor and soft tissue decreased, however, Ga-67 excretion from tumor was slower than that from non-tumor tissues. It is possible that the Ga-67 that has already entered tumor cells and is bound by specific protein in tumor cell may be less susceptible to exchange with iron than that taken up by normal soft tissue. Iron loading after Ga-67 injection suggests that the relationship between the gallium and iron is very complicated.

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GA-67 UPTAKE IN TISSUE AND IRON METABOLISM -ELEVATED GA-67 UPTAKE IN THE RAT LIVER FED ON 0.75%Zn CONTAINING DIET-.
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In previous studies we showed that Ga-67 especially bound with heparan sulfate (HS) in vitro, and that elevated Ga-67 uptakes in the liver- and heart-damaged rats were both in good accord with increased HS contents.

It has reported that Ga-67 uptake in tissues is closely correlated with iron metabolism. In this study, we tried to explane the correlation between Ga-67 uptake and iron metabolism in connection with HS.

Affinities of various cations with HS were calculated by measuring Ca-45 release from Ca-45-HS complexes. As a result, more stronger affinity than that in Ga ion was found in Fe ion. Al, Yb, In, Eu, Er, Sm and Ru represented same affinity with HS as that of Ga. These cations all produced remarkable decrease of Ga-67 uptake, nearly in parallel with their Ca-45 exchangeability.

It has well known that zinc inhibits the absorption of iron from small intestinal wall and induce anemia. Therefore, we tried to investigate Ga-67 uptake in rat tissues decreased iron content by Zn administration . Ga-67 uptakes in liver and spleen were elevated by Zn administration. While, iron contents in liver and liver HS were both lowered by Zn.

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A NEW TUMOR DIAGNOSIS RADIOPHARMACEUTICAL Tc-99m-DMS(I); CHEMICAL CHARACTER AND BIOLOGICAL BEHAVIOR.
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Great potentiality of the rich and varied chemistry of technetium is begining to be realized. Among the various possible valent state of this metal, our attention was focused on the pentavalent technetium species, $Tc(V)O^{3+}$ present in equilibrium with $Tc(V)O_4^{3-}$ species. The former considered relevant to the formation of stable chelates and the latter structure showing similarity to phosphate anion, estimated as of biological importance.

Potentiality of this approach to design Tc-radiopharmaceutical for tumor detection was considered and dimercaptosuccinic acid (DMS) was selected as the most suitable ligand to hold the Tc(V). Various labeling conditions were surveyed and a Tc-DMS estimated as with Tc in pentavalent state was obtained at an optimal pH of 8 within a very narrow $SnCl_2$ concentration range. The data gathered in in-vitro and in-vivo experiments with mouse, rat, rabbit and human showed very high accumulation in tumor cells. Above all, these data strongly supported its resemblance to phosphate anion behavior. The remarkable characteristics of Tc(V)-DMS as a new tumor imaging agent is now being tested in clinical studies.