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MICRO AND ULTRAMICROAUTORADIOGRAPHY OF GALLIUM-67 CITRATE IN EXPERIMENTAL TUMORS. K.Soh, H.Ishikawa, K.Takami and H.Okuno. Department of Orthopedic Surgery, Nissei Hospital, Osaka.  
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Ga-scan was performed to tumor bearing rabbits. We used the tumor of VX<sub>2</sub> carcinoma transplanted into the muscle of the rabbit thigh. The animal tumor resected after Ga-scan. Tumor tissue fragments were collected from the resected tumor, and radioactivities of these fragments were measured by well type scintillation counter to compare the concentration rates on different areas of the tumors. Micro and ultramicroautoradiography was done on the animal tumor for investigation of concentration and distribution of gallium-67 citrate.

Silver grains were observed in the animal tumor cells, especially in the cytoplasm of the tumor cells.

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THE EFFECT OF OUABAIN ON Ga-67 UPTAKE IN CULTURED TUMOR CELLS. M.Kobayashi, M.Yamaguchi, H.Wakao, T.Higashi. Department of Radiology, Kanagawa Dental College, Yokosuka.

It has been reported that Ga-67 uptake in tumor is related to the rate of cellular proliferation. We now attempted to examine the relationship between ouabain (a specific inhibitor of the plasma membrane) and Ga-67 uptake into cultured mouse leukemia cell (L-5178Y). The accumulation pattern of Ga-67 into tumor cell showed a single incorporation peak at 20 hours after Ga-67 administration. However, the tumor uptake of Ga-67 and the rate of cellular proliferation following administration of ouabain (0.01 mM/ml) into cultured medium were obviously diminished. Furthermore, we attempted to discern what changes are produced in ATP quantity of tumor cell when ouabain was administered into cultured medium. The quantity of ATP was measured with luminometer. The quantity of ATP in tumor cell was obviously increased compared with control after ouabain administration. From these results, it may be concluded that there is correlation between Ga-67 uptake into tumor cell and ATP in tumor cell.

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THE INFLUENCE OF IRON ON Ga-67 METABOLISM IN TUMOR AND INFLAMMATORY LESION. H.Wakao, M.Kobayashi, H.Ohtsuka and T.Higashi. Kanagawa Dental College, Yokosuka.

It is said that the mechanism of Ga-67 uptake in tumor is different from that of inflammatory lesion. This study was undertaken in attempt to discern what change were produced in Ga-67 excretion from tumor and inflammatory lesion when iron was administered at 24 hours after Ga-67 injection. The change of Ga-67 images in tumor and inflammatory lesion of rabbit after ferric citrate administration was compared. Furthermore, the ROI of the tumor in right foot and inflammatory lesion in left foot of rabbit was taken by scinticamera image, the Ga-67 count of tumor and inflammatory lesion following iron administration was measured. The Ga-67 count of tumor was suddenly increased at 10 or 20 minutes after iron administration, afterwards, the Ga-67 count was gradually decreased from tumor. The Ga-67 count of inflammatory lesion, whereas, gradually increased at 30-60 minutes after iron loading, afterwards the Ga-67 count slightly decreased. From these results, it may be concluded that the influence of iron on Ga-67 metabolism in tumor is different from that of inflammatory lesion.

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CORRELATION BETWEEN SERUM UIBC AND TUMOR UPTAKE OF GA-67. S. Nakano, Y. Hasegawa, K. Ibuka, T. Hashizume, A. Noguchi, T. Okishio, and S. Ishigami. The Center for Adult Diseases, Osaka.

We studied the effect of serum unsaturated iron binding capacity (UIBC) on the tumor uptake of Ga-67 in hepatoma and malignant lymphoma. Quantitation of tumor uptake was carried out by the region of interest technique which was reported in the 22nd meeting of this society. We compared tumor uptake of Ga-67 between cases with increased UIBC above 250 mcg/dl and those with decreased UIBC below 100 mcg/dl, because a significant difference between two groups was found in the liver uptake of Ga-67 in the cases of chronic liver diseases. Out of 58 cases of Ga-67 positive hepatoma, 24 were verified histologically and others were diagnosed clinically. In 15 cases UIBC was increased and in 9 cases it was decreased. There was a significant difference between two groups in tumor uptake of Ga-67. Seventy-six cases of histologically verified malignant lymphoma were examined. Four cases with increased UIBC before therapy showed distinct tumor uptake of Ga-67. Fourteen cases with decreased UIBC were during therapy. Decrease of UIBC seems due to suppression of bone marrow by anticancer drugs. Out of them 2 cases showed prominent accumulation of Ga-67. The effect of UIBC on the tumor uptake of Ga-67 in hepatoma seems to be different from that in malignant lymphoma.