

in vitro cellular uptake of ^{67}Ga of AH 7974F was greater than that of AH 7974, indicating a membranous localization of the gallium, cold or radioactive, in the malignant cells.

Conclusions:

The gallium adsorption on the cell membrane,

an essential phenomenon, and subsequent blockade of the membrane function would lead to the phenotypic normalization of the cancer cells. This event appears to be the fundamental and discriminating mechanisms of tumor affinity of gallium.

Ga-67 Binding Patterns in Tumor and Rapidly Growing Tissues

H. ORII, Y. SASAKI & H. OYAMADA

National Cancer Center Research Institute, Tsukiji, Tokyo 104

In respect to the relationship between Ga-67 uptake and tumor growth, we studied the tumor bearing rat with 4 different kind of experimental tumors, Yoshida sarcoma, AH130, AH7974, and Sato's lung cancer, as well as normal and partially hepatectomized regenerating liver of rat. After I.V. injection liver and solid tumors were excised, homogenized and centrifuged at 105,000G for 60 min. Subcellular fractionation was carried out on aliquot. The result indicated that there were characteristic high uptake of Ga-67 radioactivity in lysosomal fraction. However, no higher uptake was found in tumor lysosomes than normal, as

reported by Hayes and others. The 105,000 G supernatant was fractionated through Sephadex-6B, and the protein and radioactivity eluate was counted. The result indicated that there was no correlation between tumor growth, cellular growth, and eluate patterns as was reported by Matsuzawa et al. These results supported our findings on unincreased Gallium uptake in regenerating liver, and undecreased uptake in tumors treated either with X-ray or with chemotherapy.^{(1) (2) (3)}

(1) Orie: *Strahlentherapie* **144**: 192 (1972)

(2) Hill & Wagner: *JNM* **15**: 818 (1974)

(3) Gams et al: *JNM* **16**: 231 (1975)

Red Cell ^{86}Rb Uptake in Benign and Malignant Breast Tumors

T. YAMANE

National Institute of Radiological Sciences

F. K. BAUER, N. TELFER, and Q. MERRILL

University of Southern California School of Medicine

The both of cation Rb and K are often very nearly interchangeable, ^{86}Rb , with its half-life of 18.7 days, is certainly a more convenient isotope

to use, than is ^{42}K , with its short half-life of 12.7 hours.

The present study compared the RBC ^{86}Rb

uptake in benign and malignant breast lesions and female control subjects used in vitro technique (Love and Scott).

Benign and malignant breast lesions and control subjects between 15 and 83 years of age were studied (benign 15–63, malignant 32–83, female control 22–51).

The active uptake (ouabain blocked) was not significantly different between the three groups, but the passive uptake was slightly reduced two patient groups than female controls. However, between benign and malignant groups were not significantly different.

Scintigraphy of Malignant Tumor in Head and Neck

M. KUMANO, I. NARABAYASCHI, H. NISHINURA, T. KATURA

Department of Radiology, Kobe University School of Medicine, Kobe

The purpose of this paper is to evaluate the usefulness of ^{67}Ga -citrate and $^{99\text{m}}\text{Tc}$ -EHDP scintigraphy in diagnosis of tumors in head and neck.

Out of 56 cases, 37 proven cases with various head and neck malignancies were reviewed. Scintigrams were taken 48 hours and 72 hours after intravenous injection of 2mCi of ^{67}Ga -citrate and 3 hours after intravenous injections of 10 mCi of $^{99\text{m}}\text{Tc}$ -EHDP.

Abnormal area of radiopharmaceutical concentration was seen in 64% of ^{67}Ga -citrate-scintigraphy, especially prominent in thyroid cancer (undifferentiated adenocarcinoma) (4/4), malignant lymphoma (13/17), maxillary carcinoma (3/6).

All the false negative cases in this group were postirradiated cases. Laryngeal and pharyngeal cancer were all negative either irradiated or not. All the cases of undifferentiated adenocarcinoma of thyroid gland showed abnormal ^{67}Ga -citrate accumulation in the area seen as diminished radio-

activity in ^{131}I -scintigraphy.

9 cases of $^{99\text{m}}\text{Tc}$ -scintigraphy performed on patients with bony destruction on X-ray films showed abnormal RI concentration.

The conclusions are as follows:

- 1: ^{67}Ga -citrate scintigraphy are of little or limited value in early diagnosis of malignancies in head and neck, however, useful in investigation of the extent of involvement in determination of the field of radiation therapy and in evaluation of the therapeutic effect, and also much useful in classifying the stages of malignant lymphomas.
- 2: Double tracer method using ^{67}Ga -citrate and ^{131}I appeared much useful.
- 3: Bone scintigraphy using $^{99\text{m}}\text{Tc}$ -EHDP is very useful in diagnosis of tumors in head and neck, because abnormal localized RI accumulation is frequently seen much earlier than appearance of abnormality on X-ray films.