

XI. Metabolic Tracer II

Comparative Studies on the Distribution of Na^{131}I , ^{131}I -HSA, ^{131}I -AA, and ^{131}I -MAA by the Freezing Wholebody Macroradioautography

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Microradioautographic studies in mice were carried out to clarify the effect of physico-chemical state, especially of particle size of ingested isotopes on their distribution.

Four isotopes, Na^{131}I , ^{131}I -HSA, ^{131}I -AA, ^{131}I -MAA, were chosen as test materials which represent ionic, molecular, colloidal and macro-particlar states respectively.

F_1 hybrid mice of CF#1 and RF strain (30-35 g of body weight) were employed in all experiment. Animals which were intravenously injected above isotopes under the condition of thyroid block by NaI solution or non-block were serialy sacrificed 10 min., 30 min., 1 hr., 3 hrs. and 24 hrs. after injection.

Freeze-dried whole-body tissue section (40 μ thick) were exposed to high speed industrial X-ray film.

Radioautogram showed that Na^{131}I was highly accumulated in thyroid, salivary gland, stomach, seminal vesicle, bladder and skin at 30 min. after injection.

It was demonstrated that ^{131}I -HSA showed a distribution pattern independent on time which seems to represent the normal blood distribution in whole body level. This distribution pattern is very useful to evaluate the contribution from the isotopes retained in the determination of incorporated isotopes by various organs.

^{131}I -AA was mainly accumulated in liver, and also at considerably high level in bone marrow of whole body and in spleen.

In ^{131}I -MAA, maximum deposition was observed initially in lung and slightly in liver and spleen, but at 24 hrs. after injection, it was demonstrated that initially deposited isotope in lung was gradually transferred to the liver or spleen and deposited therein.

In all animals in which thyroid was not blocked, high uptake of ^{131}I in thyroid were observed in all types isotopes.

Pre-treatment by thyroid blocking agent did not produce a reduction of salivary gland uptake.

A Study on the Capacity of Permeability and Absorption in the Pulmonary Cavities and Lesions

— with Special Reference to the Analysis of Blood Radioactivity Curves and Autoradiography —

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Examinations have been made on the permeability and absorptive capacity of various kinds of pulmonary cavities and lesions of experimental (172 rabbits in all) tuberculosis, suppuration, candidiasis, Brown-

Pearce cancer, edema of pleural origin, and normal lung tissues, by employing ^{32}P , from a special viewpoint of analyzing blood radioactivity curves, primarily, and autoradiography. The following are the results thus