jected organs such as the liver, spleen, kidney, bone marrow and blood were taken out, and the radioactive activation was measured on those organs by means of Well Type Scintillation Counter, while Absorption Ratio (AR) and Differential Absorption Ratio (DAR) were obtained by the method of T. Fields et al. The systemic Autoradiograms was made by causing the freezing death in time-course after intravenous injection of chondroitin iron sulfate, and by preparing the freezing systemic slice with its thickness of 50 μ, which was dried, and then, non-screen type-x-ray film was exposed for 6 days with Contact Method.

**Results:** AR of the reticuloendothelial system of Liver showed the lowest on lanolin-fed mice at 5 minutes after i.v. injection of chondroitin iron sulfate.

Namely, the rate was 20%, on the other hand, the rate was 68% in young mice, 60% in adult mice and 56% in senile mice.

Moreover, AR measured in time-course after 6 hours was similarly low on senile mice and lanolin-fed mice as with the rate after 5 minutes, and that the decreasing rate was slow.

AR of blood was highest in lanolin-fed mice after 5 minutes, namely 70%, and it was 42% even after 10 minutes, suggesting the high remaining amount of chondroitin iron sulfate in blood.

On the other hand, AR of the spleen was the highest namely 10.3% at 30 minutes after intravenous administration in lanolin-fed group, the rate was twice that of young and senile mice.

AR of the bone marrow was high in young mice and low in lanolin-fed mice and senile mice, also the peak was delayed, and AR was lowered.

The systemic Autoradiograms showed the disappearance of the radioactive activation from blood at 5 minutes after intravenous injection in young mice, and the similar disappearance was observed on adult mice after 10 minutes, while the activation remained at the heart and the inferior vena cava even after 10 minutes in senile and lanolin-fed mice.

From the above results, retinoendothelial functions is degraded with aging.

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**Quantitative Assessment of Active Marrow Distribution by Scintigraphy**

—Comparative studies using I-131 U.d.R. for the hematopoietic marrow and Tc-99m S colloids for the reticuloendothelial marrow labeling—

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I-131 iododeoxyuridine, IUDR, an DNA precursor, was applied to label the cell-dividing i.e., hematopoietic marrow and Tc-99m sulfur colloids was used to label the reticuloendothelial one and distribution pattern of both marrow elements was compared by scintiphotographic
visualization and also by radioactivity measurement. The patients received intravenous infusion of I-131 UdR (ca. 400mcCi, 0.07mcM) with 50 mg of 5FU, aiming to increase DNA incorporation of IUdR, 24 to 48 hours prior and 5 to 10 mCi of Tc-99m sulfur colloids one hour prior to scintigraphy.

Scintiphotography was carried out at appropriate preset count over the bone marrow of the sternum, the spine, the pelvis and the knee and with the latter nuclide also of the scalp, the humerus, the elbow, the hand, the femur and the foot as well as over the liver and the spleen. In addition to comparing distribution pattern visualized in two sets of scintigrams, marrow activity was quantitatively measured for two kinds of radionuclides.

Standard samples of 1/10 administered dose of I-131 and 1/50 dose of Tc-99m in the disc plate were used for marrow uptake ratio and also for density-counts standard curve by stepwisely increasing exposure. Nine to fifteen marrow portions were selected and identified in the scintiphotograms and density in those regions was measured and transferred to radioactivity in correspondence to density-counts standard curve. Each activity was expressed in relative to that of posterior pelvis for standardization of comparison. The correlation coefficient was then calculated of two nuclides in each portion and regression coefficient of I-131 on Tc-99m was adopted.

In one normal control, the correlation coefficient, r, was 0.872 and the regression coefficient, a-i, was 0.577. The r value was over 0.9 in 10, between 0.8 and 0.9 in 8 and below 0.8 in 5 out of 23 cases. The distribution pattern appeared sometimes dissimilar due to low uptake rate of either nuclide in the marrow.

These results indicate that discrepancy may exist in the mass as a whole of two marrow element but their proportional distribution is maintained fairly well. The discrepancy was supposed sometimes to be attributable to the difference in subtlety for these elements to reflect the course of diseases.

**Bone Marrow Scintigraphy using $^{111}$In Chloride**

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As a technique for evaluating the size and distribution of hematopoietic marrow, bone marrow scintigraphy using radioactive colloid is commonly performed. However, radioactive colloids are taken up to reticuloendothelial cells in stead of hematopoietic cells. These two cells are usually distributed parallel each other, in normal bone marrow, but they are partial on its proportion in some cases of hematological disorders.

Recently, $^{111}$In chloride become to be available for visualization of bone marrow, because $^{111}$In chloride is taken up partialy to bone marrow cells.

Bone marrow scintigraphy using $^{111}$In Cl$_3$ was undertaken in order to compare with distribution pattern of the reticuloendothelial marrow delineated by $^{99m}$Tc sulfur colloid.