blood cells was performed by neutron activation analysis. Approximately 10 ml of blood was withdrawn in a heparinized syringe. A sample of blood was separated by 0.1% methyl-cellulose sedimentation technique into erythrocyte- and leukocyte-rich suspension and these blood cells were centrifuged, washed and calculated, then dried for irradiation.

Blood cell samples and elemental standards were irradiated for 1 hour at a flux of 5×10^{12} neutron cm^{-2} sec^{-1} in the Kyoto University Reactor. Irradiated cells and elemental standards were wetashed with nitric acid and hydrochloric acid and the resultant solutions were evaporated into few millilitres, then dissolved in about 2 ml of 10 N hydrochloric acid and loaded on to columns of Dowex 1×8 100–200 mesh, previously washed with 10 N hydrochloric acid. Each element was eluted by various normal hydrochloric acid and preprecipitated. Contents were measured by comparing with standards on gamma ray spectra.

Result: (Contents are expressed as micrograms per 10^9 cells in this paper.)

ACUTE LEUKEMIA

Leukocyte: Leukocyte zinc values ranged between 0.36 and 4.13 with a mean of 1.73. This average was significantly decreased, compared with normal mean of 12.80. The lowest values were found in acute myelocytic leukemia.

Copper was slightly increased and manganese was within normal range.

Erythrocyte: Erythrocyte zinc values ranged between 1.20 and 2.82 with a mean of 2.26. This mean values was increased, compared to normal mean of 1.30.

Both copper and manganese were within normal range.

CHRONIC LEUKEMIA

Leukocyte: Leukocyte zinc values ranged between 0.93 and 4.36 with a mean of 1.68, which was also significantly decreased, compared to normal zinc content. Mean values of manganese and copper were slightly decreased.

Erythrocyte: Erythrocyte zinc values ranged between 0.17 and 1.86 with a mean of 1.34. This figure showed almost normal vlaue, but the highest values were observed in the period of blast crisis.

Both manganese and copper values were slightly decreased, but within normal range.

The most remarkable change in these trace elements was found in zinc value of leukemic leukocytes, and this fact was in accord with certain previous observations.

Manganese and copper did not show marked difference in this present study.

Detailed, further studies on trace elements may explain the malignity in leukemia.

Analysis of ^{131}I Labeled Compounds in Red Blood Cell and Blood Plasma after ^{131}I Administration

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^{131}I red cell-plasma ratio after ^{131}I administration has been employed previously as a thyroid function test, but there is no sufficient research into the analysis of ^{131}I labeled compounds in red blood cell and blood plasma after ^{131}I administration.

In the present paper, ^{131}I labeled compounds were analysed by dialysis method and Sephadex G-25 filtration.

Dialysis method

Red blood cell (0.5 cc) after 24 hours of ^{131}I administration was haemolysed with 4.5 cc of distilled water, and put into a dialysis bag. This bag was incubated with mild shaking in 5.0 cc of phosphate buffer (pH 7.4) at 37°C, for 24 hours.

After incubation, the radioactivity of dialysis bag and dialysate was counted by well-type scintillation counter.

As in vitro experiment for analysis of red blood cell, the following procedures were done.

After addition of ^{131}I (0.01 μCi) into 2.0 cc of normal blood, the separated red blood cell (0.5 cc) was dialysed by the same method.

Next, 3.0 cc of blood plasma after ^{131}I administration was put into dialysis bag and

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incubated in 3.0 cc of phosphate buffer. After incubation the radioactivity in the bag and dialysate were counted.

And then the blood plasma in dialysis bag was analysed by Sephadex G-25 filtration.

As in vitro experiment for analysis of blood plasma, 3.0 cc of normal blood plasma was incubated with 0.1 μCi of ^{131}I in 3.0 cc of phosphate buffer. After incubation, the radioactivity in blood plasma was analysed by the above mentioned method.

Sephadex G-25 filtration

After incubation, ^{131}I labeled compounds in the blood plasma in dialysis bag were analysed by Sephadex G-25 column (length 8 cm, diameter 0.6 cm.

Result:

As compared with in vitro experiment used ^{131}I only, it was found that ^{131}I labeled compounds in red blood cell after ^{131}I administration were only ^{131}I, on the other hand, ^{131}I labeled compounds in blood plasma were ^{131}I and hormonal ^{131}I.

It was proved that the proportion of ^{131}I in red blood cell and blood plasma is constant irrespective of the thyroid state and ^{131}I red cell-plasma ratio is dominated by the radioactivity of hormonal ^{131}I in blood plasma.

Studies on Bone Marrow Nucleated Cells in Various Blood Diseases

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We have studied on the metabolism of DNA and proliferation activities of bone marrow cells in various blood diseases (AML 5, Megaloblastic anemia 2, Iron deficiency anemia 5, Polycythemia vera 2, ITP1) by means of the microautoradiographic technique with ^{3}H-thymidine.

The results were summerized as follows:

1) Remarkably lower labeled % of ^{3}H-thymidine was observed in the acute myeloblastic leukemia in both myeloid and erythroid series. It was indicated that the proliferative activities of the acute leukemic cells were very weak, and it was suspected that the DNA synthetic time of these cells was more prolonged than the normal.

2) In the megaloblastic anemia labeled % of myeloid cells was similar to normal, but incorporation into metamyelocytes was moderately elevated. Remarkably higher labeled % was observed in basophilic erythroblasts, but it was low in polychromatic erythroblasts.

3) Remarkably higher labeled % of ^{3}H-thymidine was observed in the iron defficiency anemia both in myeloid and erythroid series, especially in the erythroblasts.

4) In the polycythemia vera incorperation into myeloid series was depressed slightly, but in the erythroid series the incorporation was more than normals.

5) In the ITP labeled % of ^{3}H-thymidine was similar to normal in both myeloid and erythroid series.

Inhibition of DNA Biosynthesis in Human Leukemic Leukocytes by Cytosine Arabinoside and Clinical Effects of the Agent

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Effects of cytosine arabioside (CA) on nucleic acid metabolism of human leukemia leukocytes were investigated with ^{14}C-labeled precursors of nucleic acid in leukocyte suspension prepared from peripheral blood of leukemia patients. Rate of inhibition of DNA-

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