

in papillary adenocarcinoma and 83.1% in anaplastic carcinoma. Namely, the ratio is observed to be decreased according to the grade of undifferentiation of the tumor.

2) Thyroglobulin/total soluble iodoprotein ratio was 78.3% on an average, ranging 72.3% to 92.5% in the normal thyroid tissue. On the other hand, the ratio was 66.0% on an average in colloid adenoma, 41.6% in tubular adenoma, 5.9% in trabecular adenoma, 8.6% in papillary adenocarcinoma and 0% in anaplastic carcinoma. Namely, thyroglobulin is observed to be decreased according to the grade of undifferentiation of the tumor.

3) The 27 S component was found in all

the normal thyroid tissues and in the 5 of 12 colloid adenomas. However, it was not found in tubular adenoma, trabecular adenoma, papillary adenocarcinoma and anaplastic carcinoma.

4) From the above-mentioned results, it is concluded that thyroglobulin has a tendency to decrease in the tissue of thyroid nodules, especially remarkable in that of thyroid carcinoma, but there is no special component of iodoprotein in thyroid nodules. The differences in composition of iodoprotein in thyroid nodules appear to be closely related with a defects of thyroid hormone synthesis.

## On the Determination of Free Thyroid Hormone in Serum by Activation Analysis

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We have studied on determination of free thyroid hormone (thyroxine + triiodothyronine) in the serum (Tf) by activation analysis.

In our previous experience, Tf value was more than that of equilibrium dialysis method.

Now, we examined on some points of analytical procedure and Tf value was determined by new method. Previously we separated Tf from serum by equilibrium dialysis and Sephadex G25 gel filtration, but 0.25% iodide was involved in Tf measured by those procedures. So, when we add column chromatography method of cation exchange resin to this system, the recovery of Tf is 51.1% and the contamination of iodide is 0.0025%. Tf in solution form is irradiated with thermal neutron flux because of our results that in the recovery of extraction of Tf from the irradiation tube solution form (97.3%) is bet-

ter than dryness form (44.5%).

After irradiation of Tf and extraction from the tube, iodinated compounds in the sample are made to iodide by oxidation and reduction on the basis of alternation of thyroxine to  $I^-$ ,  $IO_2^-$ ,  $IO_3^-$  and many other organic iodinated compounds. Then Ag and serum are added to the sample, which is washed twice by 5% TCA in 1N  $NaNO_3$ . Recovery rate by above procedures is 42.8% (serum only: 7.8%, Ag and serum: 23.4%).

We activated Tf extracted from euthyroid serum 50 ml and hyperthyroid serum 40 ml.  $^{128}I$  from Tf was analysed with the decay curve counted by GM counter and well type scintillation counter, because of low value of  $^{128}I$  measured by pulse height analysis. In this experience, Tf value is  $1.2 \times 10^{-10}$  g/ml,  $2.0 \times 10^{-10}$  g/ml in euthyroid and  $3.1 \times 10^{-10}$  g/ml,  $3.4 \times 10^{-10}$  g/ml in hyperthyroid.