D. Measurement III
In Vivo Radioimmunoassay

Usefulness of Polyethylene Glycol in T3 Radioimmunoassay
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Routine laboratory test should better be simple and easy. This paper describes usefulness of polyethylene glycol (PEG) for the separation of bound and free in triiodothyronine radioimmunoassay. As to the incubation time, shorter duration of 2 hr at various temperatures was tested, and 2 hr at 25°C incubation was found to give almost similar binding as indicated 24 hr at 4°C. After addition of 1 ml 25% PEG centrifugation was performed at 0, 15, 30, and 60 min. The results did not differ significantly. Centrifuge at 2 to 4°C resulted in rather poor stability and room temperature centrifugation was found favorable. When added amounts of PEG were reduced to a half or increased to twice of indication, obtained standard curves did not show significant differences. All above results supported the simplicity and easiness of PEG method.

Furthermore, comparing to widely used dextran coated charcoal (D.C.C.) method, PEG showed lower experimental back ground and almost equal maximal binding, giving wider count range by the added standard T3. Clinically 48 determinations were performed by both methods, an excellent correlation (r=0.94 Y=1.08X+0.07) was obtained.

Clinical results by PEG methods in 52 cases with various thyroid disorders gave similar results as reported by other method, and 25 normal subjects ranged from 1.05 to 1.90 ng/ml average 1.48±0.25 (s.d)

In conclusion, PEG method in T3 radioimmunoassay was found quite suitable and application in commercial Kit was thought quite favorable.

Studies on Measurement of Plasma Renin Substrate Concentration and Plasma Renin Concentration by Angiotensin I RIA
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1) Measurement of plasma renin substrate concentration
One ml of crude renin extracted from human kidney by Haas' method had biological potency equal to 0.2 mg of Angiotensin II. To 50 µl of normal plasma, 25 µl of the crude renin extract and 500 µl of enzyme inhibitor (Sorin Co. kit) were added and incubated at 37°C. Angiotensin I generation was increased with incubation hours and reached to the maximum at 12 hours. After 12 hours incubation, 0.1 ml of the mixture was diluted with 9.9 ml of tris acetate buffer (0.1 M, pH 7.4), and 0.1 ml of the diluted solution was used for Angiotensin I RIA. The better parallelism of a dilution curve of Angiotensin I between 100 to 800 pg to the standard curve was observed when Sorin kit (Midoriju Co.) was used than Dainabot kit. The plasma renin substrate concentrations measured by this method ranged between 600 and 1100 ng/ml in patients with essential hypertension and there was no difference in low, normal and high renin groups. In four patients with Cushing syndrome, a high value (1530 ng/ml) was observed in only one pregnant