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## Interstitial Gland Tissue of Mammalian Ovary

By

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EXPERIMENTAL THYROTOXICOSIS: EFFECTS OF GRADED  
DOSES OF T<sub>4</sub> PLUS T<sub>3</sub>\*

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Earlier studies have shown marked species specific differences of the effects of thyroid hormones on the basal metabolic rate (BMR) and on the induction of enzyme biosynthesis (1, 2). In order to produce experimental thyrotoxicosis closely resembling the pathophysiological conditions of human thyrotoxicosis, T<sub>4</sub> plus T<sub>3</sub> were applied in a ratio of 3:1 (w/w), given for a period as long as 30 days and finally used in dosages ranging from very low to high.

Groups of rats (160 g) received nightly a limited amount of food containing the desired T<sub>4</sub>/T<sub>3</sub> addition with unrestricted normal diet during the days. The rats were thus taking A : 3.0, B : 17, C : 85, D : 0 μg of a T<sub>4</sub>/T<sub>3</sub> mixture (3 : 1) per 24 hrs. After 30 days the following parameters were estimated: BMR, body weight, heart weight, serum T<sub>4</sub> and T<sub>3</sub> uptake test (3), and induction of liver enzyme activities: glycogen metabolism, glucose oxidation, glycolysis, gluconeogenesis, glycerol-1 P-cycle, citrate cycle with side paths and β-oxidation of fatty acids.

As expected, the medium (B) and the high (C) T<sub>4</sub>/T<sub>3</sub> dosage resulted in an elevated BMR and a definite increase of the heart weight, which is a sensitive parameter of adaptation to hypercirculation. Likewise, the activities of enzymes were raised, which are particularly involved in the elevation of the BMR: mitochondrial glycerol-1 P DH, malic enzyme, PEP carboxykinase, NADP: isocitrate DH and glucose-6P DH. Increases of T<sub>4</sub>-I and of T<sub>3</sub>-uptake were found in groups B (3.5 μg<sup>0</sup>/32<sup>0</sup>/0) and C (5.2/41) as compared to controls (D : 2.7/30). The lower T<sub>4</sub> found in group A (1.4 μg<sup>0</sup>/0) may represent suppression of thyroxine secretion due to exogenous T<sub>3</sub>. The data on BMR, body weight and liver enzyme activities are consistent with the assumption that the rats of group A were still euthyroid. The daily dose of thyroid hormones, which induces a well controlled experimental thyrotoxicosis, may be somewhat less than the amount used for group B.

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