

## 7 Summary

### **Quantification of thyroid hormones in homogenates and subcellular fractions in regions of the rat brain: effects of hypothyroidism, hyperthyroidism and different stressors**

In this study concentrations of thyroid hormones in homogenates and subcellular fractions of several rat brain regions were quantified after different treatments.

First a hypothyroidism was induced as well as a hyperthyroidism with T<sub>3</sub> respectively T<sub>4</sub> in two different concentrations. Second the thyroid hormone concentrations were measured in several areas of rat brain after the treatment with different forms of stress: subchronic stress by intraperitoneal injections with physiological saline solution during a period of 14 days, acute stress in form of intraperitoneal injections with physiological saline solution three times in an interval of 30 minutes and sleep deprivation during eight hours.

The tissue homogenates were fractionised into five different subfractions: nuclei, mitochondria, microsomes, synaptosomes and myelin.

The different forms of treatment showed the following effects: hyperthyroidism with T<sub>3</sub> respectively T<sub>4</sub> in different concentrations led to no increase of the T<sub>3</sub> concentrations in the areas researched because of anti-regulation-mechanisms. Only one of four brain areas (Midbrain) showed a significant increase of T<sub>3</sub> tissue concentration in the homogenate and all subfractions.

Different forms of stress led to specific effects on the T<sub>3</sub> concentrations in different subfractions of distinct areas, but not in the serum. The effects of different forms of treatment on thyroid hormone concentrations showed that the quantification of these hormones in subcellular fractions seems to be enabled to detect changes in hormone concentrations that were not evident from measurement in the homogenate.