

liver, the pancreas, the duodenum and the colon. The fractionation studies of these brain extracts on Sephadex G-50 column indicated that approximately half of  $\beta$ -endorphin activity detected were attributable to specific  $\beta$ -endorphin. We also observed a concomitant production of  $\beta$ -endorphin in 6 ectopic ACTH-LPH producing tumors and confirmed the presence of  $\beta$ -endorphin immunoreactivity in plasma from Addison's disease and Nelson's syndrome after gel filtration on Sephadex G-50. Very small amount of  $\beta$ -endorphin in plasma was also detected in a normal subject.

Anyway, the roles of neuropeptides including  $\beta$ -endorphin in the central nervous system, the peripheral tissues as well as the blood have to be elucidated further using the specific and sensitive radioimmunoassays of these neuropeptides.

## ENDORPHINS AND ITS RECEPTOR

Norio Ogawa

Third Department of Internal Medicine, Okayama University Medical School, Okayama.

Peptides with opiate-like properties (endorphins) have been isolated from brain and pituitary, but the physiological significance of these peptides remain to be defined. Three sensitive and specific assay systems, opioid radioreceptor assay (RRA), Met<sup>5</sup>-enkephalin radioimmunoassay (RIA) and  $\beta$ -endorphin RIA, have been developed. Using these three assay systems, regional distribution of opioid receptors and concentrations of endorphins in rat brain has been determined. Total enkephalins activity by RRA and immunoreactive Met<sup>5</sup>-enkephalin found in rat brain have the regional distribution correlating with that of opioid receptors, with highest levels in corpus striatum and negligible amounts in the cerebellum. On the other hand,  $\beta$ -endorphin-like immunoreactivity has a different regional distribution from that of opioid receptors and that of enkephalins, with highest levels in hypothalamus and negligible amounts in corpus striatum. These observations suggest that  $\beta$ -endorphin might have no relationship to brain enkephalins, and that it seems to require several assay systems for studying physiological significance of enkephalins and endorphins.