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### Endocrinology

# EN 22

EFFECTS OF ORAL HYPERTONIC SALINE ON GENE EXPRESSION OF NEUROHYPOPHYSIAL HORMONES IN THE RAT HYPOTHALAMUS M. Fujiwara, S. Hyodo, M. Sato and A. Urano. Dept. of regulat. Biol., Fac. of Sci., Univ. of Saitama, Urawa, Tokyo Res. Lab., Kyowa Hakko Kogyo Co., Machida.

Effects of oral 2% hypertonic saline on gene expression of vasopressin (AVP) and oxytocin (OXT) neurons were determined by in situ hybridization (ISH), immunohistochemistry (IHC) and cytometry after 0, 2, 4 and 7 days of treatments. The ISH method used in this study can discriminate AVP mRNA from OXT mRNA. AVP mRNA levels in the supraoptic nucleus (SON) were increased chronically 2 days after the start of the treatment, but not in the paraventricular nucleus (PVN). OXT mRNA levels in both the SON and the PVN were raised phasically with the peak at the 2nd day of the treatment. AVP and OXT neurons in both nuclei showed significant hypertrophy also 2 days after the start of the treatment. Immunoreactivity of AVP in both nuclei was decreased by 7-day treatment, while that of OXT was little affected. These results suggest that the AVP neurons in the SON, in which synthesis and secretion of AVP seems to be chronically activated by oral hypertonic saline, are principally responsible for osmotic regulation, and that OXT neurons may have some roles in regulation of blood osmolarity.

## EN 23

NEUROSECRETION AND SPERMATOGENESIS IN THE LEECH, <u>ERPOBDELLA LINEATA.</u> ( II ) K.OKA' and N. TAKEDA<sup>3</sup>. 'Biol. Lab., Toho univ. Sch. of Med., Tokyo and <sup>2</sup>Dept. of Biol., Fac. of Sci., Toho univ., Funabashi.

The central nervous system in the leech, Erpobdella lineata, consists of 21 pairs of cell compartments. Among them, only 4-cell in cell compartment 11 showed seasonal changes. In winter, the cytoplasm of d-cell stained markedly with aldehyde fuchsin ( AF ) and AF-positive materials were observed not only in the cytoplasm but also in the axon. However, from spring to early autumn, their stainability reduced. In this season, on the other hand, germ cells in testes developed actively but they scarcely advanced in winter. To know scarcely advanced in winter. To know the action of the neurohormone, decapitation experiments were carried out. As a result, the decapitation acceleration induced the of spermatogenesis. From these results, during winter and act on the testes as a inhibiting hormone.

#### EN 24

RESPONSES OF FMRF AMIDE IMMUNOREACTIVE CELLS TO PHYSIOLOGICALLY ACTIVE SUBSTANCES.

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FMRF amide immunoreactive cells in the central nervous system of Achatina fulica have been detected by the PAP method. Effects of physiologically active substances, such as dopamine (DA), serotonin (5-HT), met-enkephalin (MEN), oxytocin (OXT) and arg-vasopressin (AVP) on FMRF amide cells were examined in vitro. The ganglia were cultured respectively with physiological saline containing these active substances at a concentration of 10  $^{-5}$  M for 4 hr at 23  $^{\circ}\mathrm{C}$  in the CO<sub>2</sub> incubator. When the cerebral ganglia were cultured in the media containing these active substances, FMRF amide cells were newly appeared in the middle part. By treating with the media containing 5-HT and DA, the number of FMRF amide cells increased in the medial part of the cerebral ganglion. On the contrary, by the same treatments, the number of FMRF amide cells decreased in the by subesophageal ganglion. However, treating with AVP, the number of FMRF amide cells increased in the medial, middle and lateral parts of the pedal ganglion. These results suggest that the production of FMRF amide is concerned with these physiologically active substances, in particular with DA and AVP.

### EN 25

PHYLOGENETIC DETECTION OF OXYTOCIN- AND VASOPRESSIN-IMMUNOREACTIVE CELLS IN INVERTEBRATES.

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Detection of oxytocin (OXT)- and Argvasopressin (AVP)-immunoreactive cells was performed phylogenetically by the PAP method in the central nervous system of invertebrates. Both OXT- and AVP-cells were detected in the nerve cells including neurosecretory cells of <u>Hydra</u> magnipapillata of Coelenterata, <u>Neanthes</u> japonica and <u>Pheretima</u> communissima of Annelida, <u>Oncidium verrucosum</u> and <u>Limax</u> marginatus of Mollusca, and <u>Baratha</u> brassicae of Arthropoda. The nerve cells including neurosecretory cells were reacted only with AVP antiserum in <u>Ampullarius</u> insularus, <u>Aplysia</u> <u>kurodai</u>, <u>Bradybaena</u> <u>similaris</u> and <u>Achatina</u> <u>fulica</u> of Mollusca, Ligia exotica, Hemigrapsus sanguineus and Gryllus bimaculatus of Arthropoda, <u>Asterina</u> pectinifera of Echinodermata, and <u>Halocynthia roretzi</u> of Protochordata. On the contrary, neither OXT- nor AVP-immuno-reactivities were found in the central nervous system of Bipalium sp. of Platy-Helice tridens of Arthropoda. From these results, OXT- and AVP-immunoreactive substances were shown to be present not only in vertebrates but also in invertebrates. These peptides seem to be introduced to these invertebrates at an early stage of phylogenetic history.