

and the cytoplasm contained variable amounts of small RER cisternae along with active Golgi regions and variable numbers of secretory granules (5- and 50- μ g groups). Control GtH cells were consistently inactive. The *in vitro* incubation of pituitaries from sexually active females for 15 and 30 min (5 and 50 μ g LH-RH) resulted in increased granular exocytosis and evidence of fusion of some RER cisternae to the cell membrane. After 1 and 3 hr GtH cells were variable but often contained fewer secretory granules than controls and their RER sometimes contained granules. *In vitro*, LH-RH appeared primarily to increase the synthetic activity (increased RER) of GtH cells from regressed fish and increased the secretory activity (degranulation) of cells from sexually active animals. A similar, though less marked, effect occurred *in vivo*. These results suggest that an LH-RH-like peptide may be involved in the control of the GtH cells of *P. latipinna*. Furthermore, they also indicated that secretory material may be released directly from the RER without the involvement of the Golgi apparatus.

80. *The Role of Environmental Calcium in the Control of Prolactin Secretion in the Teleost Sarotherodon mossambicus (Tilapia mossambica)*. S. E. WENDELAAR BONGA, AND J. C. A. VAN DER MEIJ, Department of Zoology, University of Nijmegen, Nijmegen, The Netherlands.

In the cichlid *S. mossambicus*, as in other euryhaline teleost fish, prolactin secretion is reduced following transfer from fresh water to seawater. The reduction has been ascribed to the high osmolarity or the high Na^+ content of seawater. In sticklebacks we found evidence that the high Ca^{2+} concentration in seawater is the main factor responsible (Wendelaar Bonga, 1978, *In "Comparative Endocrinology"* (Gaillard and Boer, eds.), pp. 259–262, Elsevier, Amsterdam). Prolactin cell activity is inversely related to the external Ca^{2+} level in fresh water as well as in seawater. Prolactin proved to be hypercalcemic in sticklebacks. To establish whether these results are of wider significance the relationship between Ca^{2+} and prolactin was investigated in *S. mossambicus*. In this fish prolactin is known to enhance plasma Na^+ and osmolarity (Clark, 1973, *Gen. Comp. Endocrinol.* 21, 498–513). Pituitary cells *in vitro* respond by increased secretion to a reduction of the osmolarity of the culture medium (Nagahama *et al.*, 1975, *Gen. Comp. Endocrinol.* 25, 166–188). A negative feedback relation between prolactin secretion and plasma osmolarity has been suggested. We did not find such a relationship *in vivo*. A few injections of ovine prolactin increased plasma Na^+ , K^+ , Ca^{2+} , and osmolarity. However, prolonged administration of *Sarotherodon* prolactin, accomplished by implantation of the hypophyseal prolactin lobes in intact fish, led to a persistent increase of plasma Ca^{2+} only. Exposure of fish to solutions with varying Na^+ or Ca^{2+} levels or varying osmolarity revealed that prolactin cell secretion is inversely related to external Ca^{2+} , not to Na^+ or osmolarity. Implantation of pituitary prolactin lobes in freshwater fish decreased the osmotic water influx through the gills. An increase in ambient Ca^{2+} ion concentration had a similar effect. We suggested that prolactin facilitates survival in a low-calcium environment like freshwater by compensating for the effects of low Ca^{2+} levels on water and ion permeability of the integument.

81. *A Study on the Heterogeneity of the Pituitary Gonadotropin from Sturgeon (Acipenser stellatus Pall.)*. B. F. GONCHAROV, E. BURZAWA-GERARD,* AND A. A. KUZNETSOV, Institute of Developmental Biology, Academy of Sciences, Moscow, USSR, et *Lab. de Physiologie générale et comparée, Muséum national d'Histoire naturelle, Paris, France.

Analysis of biochemical characteristics of the gonadotropin purified from pituitaries of a chondrosteian fish, *Acipenser stellatus* (aci-GTH) (Burzawa-Gerard *et al.*, 1975) has revealed the homogeneity of the preparation by the criterion of molecular weight (ultracentrifugation and SDS–electrophoresis on polyacrylamide gel) and by N-terminal amino acid analysis. On the contrary, using electrophoresis and isoelectrofocusing the preparation was shown to be markedly heterogenous. The determination of gonadotropic activity (amphibian oocyte maturation test) in the eluates of gel showed the activity of the aci-GTH molecules with different charge. To investigate further the nature and the role of the heterogeneity of aci-GTH, four preparations were obtained by ion exchange chromatography on DEAE-cellulose. Two of them, as shown by electrophoresis and isoelectrofocusing were practically free of contamination by each other. A comparative study of these preparations using oocyte maturation and spermiation tests revealed that their specific activity ratios were different. Experiments are in progress to choose between the following possible explanation of this phenomenon: (1) existence of sex-specific gonadotropins; (2) presence in one of these preparations of molecules active only in one of the test systems used.

82. *Presence of a Gonadotrophin in the Rachendachhypophyse of the Pituitary Gland of the Rabbit Fish Hydrolagus colliei (Chondrichthyes:Holocephali)*. J. M. DODD, M. H. I. DODD, AND N. JENKINS, Department of Zoology, University College of North Wales, Bangor, Gwynedd, United Kingdom.

Elasmobranch and holocephalan fishes have pituitary glands that are strikingly subdivided into regions and both have a lobe that is segregated from the others and which in the former is called ventral lobe (VL) and in the latter, the pharyngeal hypophysis or rachendachhypophyse (RH). In both groups this isolated lobe is vas-