

Novel Mechanisms of the Regulation of Reproduction by Novel Brain Hormones

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【Outline of survey】

Probing undiscovered neurohormones that play important roles in the regulation of reproduction is essential for the progress of reproductive biology. In the classical concept, neurohormonal control of gonadotropin secretion at the level of the anterior pituitary gland is primarily through the stimulatory action of the hypothalamic decapeptide, gonadotropin-releasing hormone (GnRH). Until recently, an inhibitory hypothalamic neuropeptide for gonadotropin secretion had not been identified in vertebrates. In 2000, we discovered a novel hypothalamic neuropeptide inhibiting gonadotropin release in quail and termed it gonadotropin-inhibitory hormone (GnIH). A gonadotropin inhibitory system is an intriguing concept and provides us with an unprecedented opportunity to study the regulation of reproduction from an entirely novel standpoint. In this project, we will identify novel neuropeptides closely related to GnIH (GnIH homologues) in the brains of a variety of vertebrates including human and invertebrates as well. We will also demonstrate novel mechanisms of the regulation of reproduction by the action of GnIH and GnIH homologues. In this project, we will further analyze the mode of action and functional significance of GnIH and GnIH homologues underlying the regulation of reproduction.

【Expected results】

This project will demonstrate novel mechanisms of the regulation of reproduction by GnIH and GnIH homologues. The generality of these novel mechanisms across various vertebrates including human and invertebrates will be obtained. This project will also demonstrate the evolutionary origin of GnIH and GnIH homologues and their unity and divergence based on their structural analyses. This project will be beneficial for the development of new therapeutic drugs against reproductive disorders in human.

【References by the principal researcher】

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- **K Tsutsui**, T Ubuka and GE Bentley (2006) Melatonin action on neuropeptide induction through receptor-mediated mechanisms in the brain. **In: MELATONIN: from Molecules to Therapy**, SR Pandi-Perumal and DP Cardinali (eds) Nova Science Publishers, New York, in press

【Term of project】 FY2006 - 2010

【Budget allocation】 22,500,000 yen

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