Comparative Neuroendocrine Mechanisms in the Control of Reproduction

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Since fish are the most numerous and phylogenetically diverse species of vertebrates, they can teach us important principles about fundamental processes in vertebrate evolution, development and disease processes. Recently, fish models have extended their application to a wide variety of experimental studies relevant to human disease. Using fish as a model, we have been studying mechanism of neuroendocrine control of reproduction. We have identified multiple GnRH systems and for the first time identified a non-mammalian vertebrate receptor for Kisspeptin (GPR54=Kiss-R), and shown its role in reproduction and the onset of puberty as in other vertebrates. Further, we have recently cloned a novel kisspeptin gene (*kiss2*) in the zebrafish and medaka, which encodes a precursor protein containing a core sequence slightly different from that of Kiss1. In addition to two kisspeptin types, two kisspeptin receptor types (Kiss-R1 and Kiss-R2) have been identified in various non-mammalian vertebrates, which suggest multiple kisspeptin/Kiss-R systems in non-mammals. The existence of Kisspeptin-GnRH system in non-mammalian vertebrates suggests its importance in the reproductive process as a core mechanism in vertebrates. This talk will review the use of fish models in biomedical research, in particular in the area of reproductive neuroendocrinology.