Regulation of the mouse GnRH receptor gene: insights from different model systems

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Regulation of gonadotropin-releasing hormone (GnRH) receptor levels in the gonadotropes of the anterior pituitary constitutes a crucial control point in reproduction. The levels of functional, expressed receptor determine the ability of a cell to respond to the GnRH hormone, and thus to regulate all aspects of reproductive function in vertebrates. This presentation will give an overview of the results generated by this group on the transcriptional regulation of the GnRH receptor in two gonadotrope cell lines. In particular, it will focus on the regulation of receptor levels by its homologous hormone GnRH, as well as another hypothalamic peptide factor PACAP. Our efforts have also focused on elucidating the mechanisms whereby these hormones exert their influence on receptor levels, by investigating the intracellular signalling pathways and transcription factors involved in mediating the down-stream effects of these hormones. A model will be presented which outlines our current ideas about the role of various kinase pathways, such as Protein Kinase A, nuclear receptors and other transcription factors such as CREB, and their cognate promoter binding sites, on transcriptional regulation of this key gene.