

NEUROENDOCRINOLOGY OF PROLACTIN REGULATION IN BIRDS

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Prolactin (PRL) has long been associated with avian reproduction. PRL secretion, which is under tonic control in avian species, is stimulated by vasoactive intestinal peptide (VIP), which meets the classical criteria required for releasing factors. VIP mediates PRL gene expression via a 35-bp VIP response element located between position -70 and -40 on the turkey PRL promoter gene. The group of VIP neurons regulating PRL secretion is located in the infundibular nuclear complex (INF) of the caudal hypothalamus. While neurotransmitters regulating the VIP/PRL system remain uncertain, groups of dopamine (DA) cells are prominent in the avian hypothalamus. Both D₁ and D₂ DA receptors display abundant mRNA in the hypothalamus and pituitary, and have been shown to mediate, respectively, the stimulatory and inhibitory influences on PRL release and gene expression. The stimulatory effect is mediated via preoptic area (POA) dopaminergic stimulation of hypothalamic VIP release and gene expression. The inhibitory effect occurs at the pituitary level where DA from the dorsolateral INF DA neurons overrides the stimulating effect of VIP on PRL secretion. It has been demonstrated that the changes in the expression of VIP receptors at the pituitary level were in part, regulated the variations in prolactin secretion as well. The interaction between VIP and DA at the pituitary level is mediated by intracellular Ca²⁺, with VIP increasing intracellular Ca²⁺, and DA closing Ca²⁺ channels.

Key words: *Birds, Dopamine, Prolactin, Vasoactive intestinal peptide*