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The relative importance of vasoactive intestinal peptide and peptide histidine isoleucine as physiological regulators of prolactin in the domestic turkey ☆

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Abstract

In mammals, prolactin (PRL) secretion is regulated by vasoactive intestinal peptide (VIP) and peptide histidine isoleucine (PHI). In birds, however, VIP is considered a PRL-releasing factor (PRF), while the role of PHI is unknown. The purpose of this study was to compare the effects of turkey PHI (tPHI) and turkey VIP (tVIP) on PRL secretion *in vitro*, and to study their physiological significance *in vivo* through active immunization against tPHI and tVIP. *In vitro* studies were conducted using pituitary cell cultures from female turkeys. In the *in vivo* study, female turkeys were immunized with keyhole limpet hemocyanin (KLH; control), synthetic tPHI conjugate (KLH–tPHI), or synthetic tVIP conjugate (KLH–tVIP). Both tVIP and tPHI stimulated PRL secretion from anterior pituitary cells in a dose response manner. However, tPHI was 100-fold less potent than tVIP in stimulating maximum PRL secretion *in vitro*. In addition, the highest dose (10^{-4} M) of tPHI inhibited its own PRL-releasing activity as well as that of VIP-stimulated PRL release. Whereas, circulating PRL levels and nesting activity remained low and unchanged during the photo-induced reproductive cycle (i.e., experimental period) in tVIP-immunized birds, control and tPHI-immunized turkeys showed a significant increase in plasma PRL levels and in the incidence of incubation behavior over time following photostimulation. These findings, taken together with earlier results, indicate that VIP is the sole physiological PRF in the turkey (avian species).

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