NOTICE OF PUBLICATION

AQUACULTURE & FISHERIES INNOVATION LAB

RESEARCH REPORTS

Sustainable Aquaculture for a Secure Future

Title: **Prolactin is a major inhibitor of hepatic Leptin A synthesis and secretion: Studies utilizing a homologous Leptin A ELISA in the tilapia**

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Abstract: The present study identifies regulatory interactions between leptin A (LepA) and the pituitary hormone prolactin (PRL). In order to measure tilapia (*Oreochromis mossambicus*) LepA, an enzyme-linked immunosorbent assay (ELISA) utilizing a rabbit polyclonal antibody specific to tilapia LepA was first developed. The antibody shows strong cross reactivity to recombinant tilapia LepA (rtLepA), and a corresponding 16 kDa protein in both tilapia and striped bass plasma, but not to recombinant human leptin (rhLep). The assay has a linear detection range of 0.25–1000 nM, with intra- and interassay variability of 9% and 16%, respectively. Plasma LepA levels measured in tilapia ranged from 0.8 to 3.9 nM, similar to that found for other vertebrates. Hypophysectomy (Hx) increased circulating LepA and lepa mRNA levels in the liver, the dominant source of hormone production. Adminstration of ovine PRL (oPRL, 5 lg/g BW) to Hx fish restored circulating LepA and hepatic lepa mRNA levels to those of control fish. Additionally, oPRL reduced lepa mRNA levels in a dose-dependent fashion in cultured hepatocytes following an 18 h incubation. Previous work in our lab indicates that rhLep stimulates PRL release in vitro from tilapia pituitaries. Here, both rtLepA and rhLep (0.5 lg/g BW) increased mRNA expression of tilapia prolactin mRNAs (prl1, prl2) in the pituitary in vivo. These results demonstrate that LepA enhances pituitary

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prolactin synthesis and release, while PRL in turn inhibits hepatic leptin secretion and synthesis in teleosts. We postulate this regulatory interaction may be necessary for mobilizing energy reserves during acute hyperosmotic adaptation.

This abstract was excerpted from the original paper, which was published in General and Comparative Endocrinology (2014). 207: 86-93.

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