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**Major Professor:** Dr. Ian Bird

**Degree Objective:** Ph.D. Endocrinology and Reproductive Physiology

**Background:** BS Biology, Winona State University; MS Biology, Loyola University Chicago

**Current Research Project:**

Pheromones are chemical signals released into the environment that can elicit a behavioral and/or physiological response in another member of the same species. In fish, an “alarm chemical” from a skin wound is released during predation that alerts conspecifics of a potential threat. The chemical mixture released from the wound contains water-soluble molecules with the potential to activate olfactory receptors in other fish. These odour-activated receptors can signal endocrine responses to enhance survival. Alarm chemicals have been shown to induce changes in fish body conformation, but, to our knowledge, there are no reports that predation can alter the growth rate of any fish species. The goals of this project are to (1) determine the source and chemical nature of the growth-promoting signal, (2) elucidate the mechanisms of action, and (3) develop a practical strategy to use pheromones to increase production of fish for aquaculture.

I hypothesize that the pheromone is associated with the glycosaminoglycan (GAG) chondroitin-sulfate, of a particular chain-length and sulfation pattern. This compound, along with skin-extract, has been used in a behavior assay we have developed to rapidly screen alarm chemical response in yellow perch (*Perca flavescens*). I will use HPLC/MS to determine the chemical nature of the alarm substance, focusing on those size of fractions that elicit a behavioral response. I also hypothesize that the odour acts by stimulating the production and release of insulin-like growth factor (IGF), or downregulates somatostatin, key hormonal regulators of growth in fish.

**Honors:**

**Grants Received:**

**Publications:**

Hoppe, P. D., E. J. Rosi-Marshall, H. Bechtold. 2012. The antihistamine cimetidine alters invertebrate growth and population dynamics in artificial streams. *Freshwater Science*, 31(2).

Barry, T.B., G.K. Dehnert, P.D. Hoppe and P.W. Sorenson. 2017. Chemicals released by predation increase growth rate of yellow perch. *In review*. *Journal of Fish Biology*.



**National Presentations:**

**Other Presentations:**

**Teaching and Mentorship:**

**ERP Service:**