



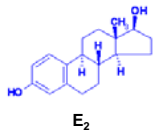
Endocrine Disruptors and Growth in the Tilapia, a Euryhaline Fish

Background

- Endocrine disruptors (ED) are compounds that affect animal reproduction, development, and behavior, but little is known about their effects on growth.
- Vertebrate growth is regulated by the growth hormone (GH)-insulin-like growth factor (IGF-I) axis.



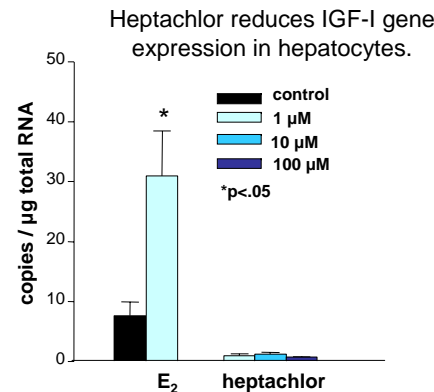
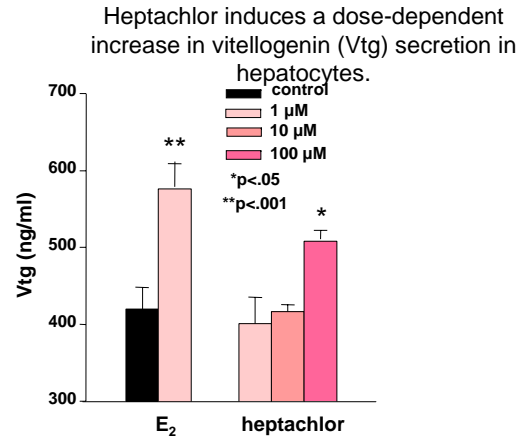
- Primary objective of my study is to examine *in vitro* effects of heptachlor, an estrogenic pesticide, on the GH-IGF-I axis, using estradiol-17 β (E₂) as a positive control.



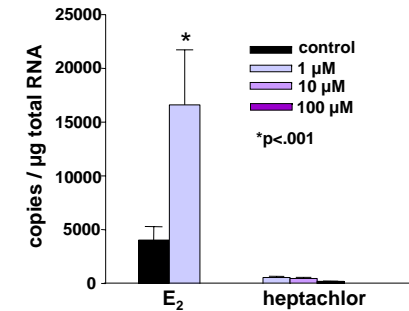
Methods

- Hepatocytes of the male tilapia (*Oreochromis mossambicus*) were isolated by collagenase digestion.
- Hepatocytes were dispersed, plated, and treated with 1 μ M E₂ or 1-100 μ M heptachlor for 48 h.
- Culture media was analyzed for secretion of the yolk precursor protein, vitellogenin, using ELISA.
- Total RNA was isolated for analyses of gene expression of IGF-I and GH-receptor (GH-R) via real-time PCR.

Results



Heptachlor reduces GH-R gene expression in hepatocytes



Conclusions & Future Plans

- Heptachlor stimulated Vtg secretion dose dependently in tilapia hepatocytes.
- E₂ stimulated both IGF-I and GH-R mRNA expression at 1 μ M.
- Unexpectedly, however, heptachlor suppressed expression of IGF-I and GH-R genes at all concentrations tested, suggesting that E₂ and heptachlor use different mechanisms in interacting with the GH-IGF-I axis.
- Further studies will be done to clarify these differences, in part by using other EDs such as DDE and PCB #138 and analyzing expression of the three different forms of Vtg.
- In vitro* culture of pituitary glands with EDs will also be done to see how EDs alter normal pituitary activity and responsiveness. In addition, long-term *in vivo* studies will be carried out to examine how EDs affect growth regulation at whole animal level.

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