

Poster #7

Acetochlor Alters Thyroid Hormone Receptor Gene Expression in Amphibian Tadpole Tails Without Modulating the Thyroid Axis

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There is mounting evidence that environmental contaminants can disrupt thyroid hormone (TH) action. In amphibians, this could have a profound effect on the ability of the tadpole to successfully complete metamorphosis into a frog. We have investigated the effects of the preemergent herbicide, acetochlor, on amphibian morphology and thyroid hormone-dependent gene expression during metamorphosis. Premetamorphic *Xenopus laevis* and *Rana catesbeiana* tadpoles were exposed to TH and acetochlor alone or in combination. Total RNA was isolated from the tail at various timepoints and expression of the TH receptor genes, TR α and TR β , was determined using reverse transcriptase-polymerase chain reaction analyses. Treatment *in vivo* or in organ culture with acetochlor results in a modest increase in TR α and a substantial increase in TR β expression by 24 hours. Acetochlor in combination with 10⁻⁷ M TH markedly enhances TR β expression compared to TH alone. These results correlate with observed morphological changes in culture. Interestingly, 10⁻⁸ M acetochlor increases the rate of TH-induced tail resorption whereas 10⁻⁶ M acetochlor delays this process. Since the levels of TH used in these experiments are equivalent to those found in metamorphosing tadpoles, these data imply that acetochlor could have adverse effects on spontaneous metamorphosis. Furthermore, these results indicate that acetochlor alters TH-mediated gene expression directly within target tissues without the need for modulation of the thyroid axis.