

Poster #18

Biotransformation and Disposition of Testosterone in the American Mud Snail, *Ilyanassa obsoleta*.

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Elevated testosterone levels have been reported to be associated with imposex, the superimposition of male characteristics such as a penis and vas deferens on female gonochoristic snails. Tributyltin (TBT), a marine biocide in anti-fouling paints, is a known causal agent of imposex. Evidence suggests that imposex is elicited by TBT-mediated changes in the biotransformation and disposition of testosterone. To identify potential targets of TBT in gastropod species susceptible to imposex, biotransformation and disposition of testosterone in normal individuals must first be characterized. Non-imposex mud snail, *Ilyanassa obsoleta* readily extracted [¹⁴C]testosterone, added to aqueous media, and converted the testosterone to at least five apolar conjugates designated AP1 through AP5. All were retained by the organisms. No significant amount of [¹⁴C]testosterone was retained or eliminated as polar metabolites. Following enzymatic hydrolysis of the most abundant metabolite (AP1) free fatty acids and [¹⁴C]testosterone were liberated. Furthermore, AP1 was produced when homogenized snail tissue was incubated with [¹⁴C]testosterone and oleoyl coenzyme A or palmitoyl coenzyme A. These results indicate that AP1, which represents over 70% of the testosterone biotransformation products is a fatty acid ester of testosterone. Apolar metabolites AP2-AP5 might represent testosterone derivatives that are multiply conjugated to fatty acid molecules. Fatty acid conjugates of testosterone have not been previously described in the gastropods. The esterification of testosterone to fatty acids might be a mechanism by which steroid titers are regulated and might represent a target of TBT toxicity.