Title: An interlaboratory study measuring sex steroids with RIAs and/or ELISAs: are we comparing apples to oranges?

Track: Aquatic toxicology and ecology

Session: Aquatic toxicology and ecology general

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Abstract:

Endocrine-disrupting chemicals (EDCs) are exogenous substances released into the environment that can lead to adverse reproductive effects in fish by a number of mechanisms including altering circulating levels of estradiol (E2), testosterone (T) and 11-ketotestosterone (11KT). Common methods to measure steroids in plasma samples include radioimmunoassays (RIAs) and enzyme-linked immunosorbent assays (ELISAs). This study had four primary objectives: (1) to compare precision and accuracy of RIA with ELISA, (2) to determine whether or not our ability to quantify plasma hormone concentrations has improved in over the past decade, (3) to determine the effect of using a standardized extraction on measurement variability and (4) to examine if the accuracy and variability of low and high hormone levels is constant across all concentrations (i.e. at either end of a standard curve). Wild white sucker (*Catostomus commersoni*) were collected from northern Lake Superior, near Terrace Bay, Ontario (48°50'N, 86°58'W), at either Little Gravel River (reference site) or Sawmill Creek (exposed site). At Sawmill Creek, white suckers are exposed to bleached kraft mill effluent. Preliminary results suggest that steroid values differ between RIA and ELISA methods, and caution should be used when comparing data from studies using differing methods. However, our ability to distinguish populations of fish that are exposed to EDCs such as pulp mill effluent is likely unaffected. Based on the results of this inter-laboratory study, we will provide recommendations to improve accuracy and precision of steroid measurements in fish ecotoxicology studies.