Schwindt, Adam R; Feist, Grant W; Schreck Carl B. 2006. Stress does not inhibit induced vitellogenesis in juvenile rainbow trout. Environ Biol. Fish. In press and online at: DOI 10.1007/s10641-006-9144-y

Abstract
Vitellogenin (Vtg) is a widely used biomarker for xenoestrogen exposure in male fishes. In female fishes Vtg can be negatively affected by stress independent of declines in estrogen. However, few data are available on the effect of stress in male fish abnormally producing Vtg, such as when exposed to xenoestrogens. The objective for these studies was to determine the effects of stress on fish forced to produce Vtg. Three weeks prior to the experiment immature juvenile rainbow trout, Oncorhynchus mykiss, were acclimated to the experimental tanks and fed a maintenance ration. We induced Vtg synthesis by injecting 17b-estradiol (E2) 7 days prior to experimentation. Treatments in duplicate tanks were: (1) no stressor; (2) stressor; (3) E2; (4) E2 and stressor. Plasma was collected at time = 0 for baseline measurements from eight fish per tank and Vtg was significantly elevated in treated fish compared to uninjected controls. Water was drained from the stressor tanks then refilled to a level that just covered the backs of the fish. Eight fish were sampled again at 4 and 9 h, and 1, 7, and 14 days of continuous stress. Stressor tanks were refilled with water to pre-stress levels and the fish were sampled after another 2 weeks. Cortisol was significantly elevated from the unstressed fish at 4 h; however, plasma Vtg in the E2-stimulated fish was not affected by the stressor at any timepoint. These results indicate that fish capture procedures employed in the field or caging experiments likely do not lead to false negative results when plasma Vtg is used as a biomarker for xenoestrogen exposure. It also suggests that the energetic load induced by stress is insufficient to cause a reduction in Vtg, during a continuous E2 administration, at least within the timepoints examined in this study.