Evaluation of whether gemfibrozil is a peroxisome proliferator in fish

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Gemfibrozil is a pharmaceutical that indirectly modulates cholesterol biosynthesis through effects on peroxisome proliferator-activated receptors (PPAR), which are transcriptional cofactors that regulate expression of genes related to lipid metabolism. An enzyme found in the peroxisome known to have its activity regulated by PPAR activation is fatty acyl-coenzyme-A oxidase (FAO). Although, gemfibrozil is a known mammalian hepatic peroxisome proliferator, it may not operate via this mechanism in non-target species such as fish. Because gemfibrozil is commonly detected in surface water, it is important to investigate the effects of the drug on non-target species. The purpose of this study was to determine if gemfibrozil elicits the same pharmacological mechanism in fish as it does humans, by measuring *in vitro* effects of gemfibrozil on FAO activity in fish. *In vitro* experiments with tissue (e.g. liver) explants from several fish species (fathead minnow, zebrafish, rainbow trout) were incubated with various concentrations of gemfibrozil and FAO activity was measured. Initial results suggest that gemfibrozil is a less potent peroxisome proliferator than in mammals, and may not operate via the same pharmacological mechanism in fish as in humans. This study adds to our knowledge of possible effects of a common aquatic pharmaceutical pollutant on fish PPAR actions.