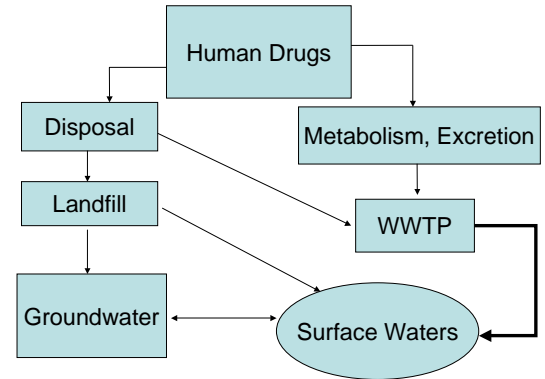


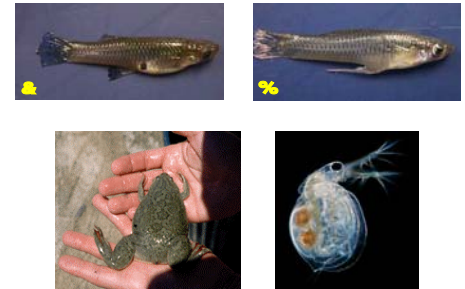
The Environmental Issue

- Heavy use of human prescription and over the counter drugs
- SSRI antidepressants are widely prescribed
 - Prozac®, Zoloft®, Paxil®, Celexa®, Luvox®
 - Among the 200 most prescribed drugs
 - www.Rxlist.com
- Drugs and metabolites are excreted by humans
 - Enter sewers or septic tanks for treatment
 - Wastewater treatment may not degrade
 - May be released to aquatic environment
- Could SSRIs cause adverse effects in the aquatic environment?



The Proposed Research

- Characterize degradation, fate of these drugs in the aquatic environment
- Measure acute and chronic impacts on aquatic organisms
 - Invertebrates (water flea), mosquito fish, frogs



Toxicity Results

- Prozac has toxic effects in long-term exposures
 - Delayed development in fish
 - Altered behavior in fish and frogs
 - Delayed metamorphosis in frogs
 - Limb malformations in frogs
- Effects were measured at 0.6-100X the concentrations measured in streams



Impact of EPA-Sponsored Research

- SSRIs have potential to impact aquatic organisms
- Need for effective removal of SSRIs and other drugs by wastewater treatment plants (WWTP)
- Future regulatory action may be warranted



Cooperating Scientists
 University of Georgia: Ted Henry, Emily Rogers, Ben Hale
 Mississippi State Chemical Lab: Kevin Armbrust, Jeong Wook-Kwon



Control

Prozac