

## Research Round Up

**Title of the project:** Impact of industrially based endocrine disrupting chemicals on aquatic biota

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**Funding Body:** ARC Linkage grant

**Collaborating organisations:** Sydney Olympic Park Authority, Landcare Research, NZ, CSIRO Land and Water, Adelaide

**Key issue/s addressed:**

To examine linkages between industrially generated endocrine disrupting compounds (EDCs) and aquatic biota, and providing insights and a mechanistic understanding about the influence of EDC contaminated waters on environmental health.

**Objectives:**

1. Examine the effects of EDCs, e.g. persistent organic pollutants (POPs) in water bodies of Sydney Olympic Park (SOP), using different levels or biological organisation (i.e. *in vitro* and *in vivo* bioassays, populations and communities) to assess risk.
2. Determine the dynamics and bioavailability of POPs in the sediment and pore water in water bodies of SOP to provide risk assessment.

**Planned Outputs/Outcome (by when):**

- Presentation of papers at SETAC North America (November 2007) – To be presented by Chris Rawson
- Publication of papers in peer reviewed journals (various dates)
- Submission of PhD thesis (January 2008) – Christopher Rawson

**Methodological approach:**

- Screen of waters and sediments of SOP for estrogen receptor ligands using the ERBA;
- Analysis of the distribution of aryl-hydrocarbon receptor ligands (dioxins, PAHs etc) in sediments and surface waters using the H4iiE bioassay;
- Analysis of the hepatic CYP1A activity in the mosquitofish inhabiting waters using the EROD assay;
- Population dynamics of the mosquitofish inhabiting waters of Sydney Olympic Park to examine any effects of increased levels of POPs and/ or hepatic CYP1A activity
- Macroinvertebrate community analysis of sediments and riparian zone of the water bodies of SOP;
- Chemical analysis of the sediments and pore water of the water bodies of SOP.

**Key findings so far:**

- There is no evidence of estrogen receptor ligands in the waters of SOP. The sediments of certain water bodies had measurable concentrations of ligands but insufficient to result in morphological effects on secondary sexual characteristics of the male mosquitofish;
- There were measurable concentrations of ligands for the aryl-hydrocarbon receptor in both the waters (generally very low) and the sediments (low to very high) which were comparable to other urban impacted sites in the Sydney region;
- Hepatic CYP1A activity in the mosquitofish varied across the different study sites and was dependent on the season of capture. These were within the range found within reference sites across Sydney
- Sediments showed moderately high levels of PAHs and PCBs in the fresh water bodies of SOP and very high levels in the adjacent Homebush Bay.
- High spatial variability in the population dynamics of mosquitofish within SOP, suggest problems with the use of this species without knowledge of the reproductive stages of individual sites.

**Please tick the relevant theme below:**

Monitoring/ Analysis  Exposure assessment  Environmental Fate  Effects

Treatment Technology  Risk Assessment  Other