



How to use the EcoToxChip?

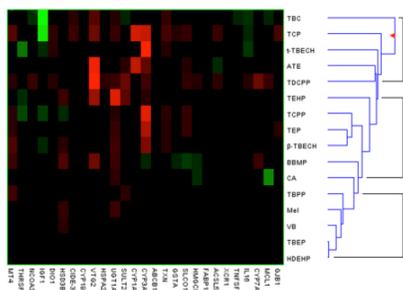
BACKGROUND INFORMATION

Our project aims to develop, test, validate, and commercialize quantitative PCR arrays (EcoToxChips) and a data evaluation tool (EcoToxXplorer.ca) for the characterization, prioritization, and management of environmental chemicals and complex mixtures of regulatory concern. This builds on our recent successes in developing and prototyping an Avian ToxChip to prioritize chemicals and assess contaminated sites. This approach was immediately embraced by Canadian regulators and other end-users, thus providing a template and mandate to scale-up activities here. To date, we have shown that our Deliverables address the needs of diverse end-users.

EXAMPLES OF USE

#1 – Screen and Prioritize

- Avian ToxChip compared transcriptomic signatures of >25 priority flame retardants to assist in chemical prioritization for follow-up in *in vivo* studies
- Resulting transcriptomic data incorporated into screening assessment reports



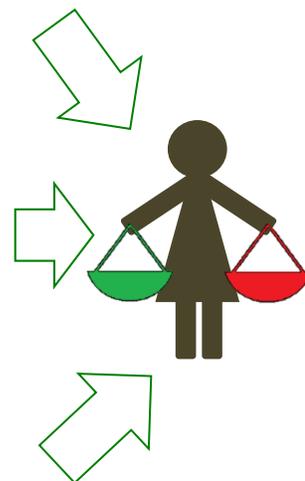
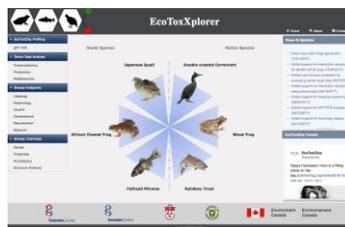
#2 – Characterize Complex Mixtures

- Avian ToxChip differentiated transcriptomic profiles of complex extracts derived from variably contaminated sites across the Great Lakes region
- Cost-effective tool for assessing complex mixtures and efficacy of remediation activities
- 2nd runner-up prize as best paper in ES&T 2015



#3 – EcoToxXplorer for Analyses & Visualization

- Bioinformatics remains a barrier to most; intuitively designed EcoToxXplorer.ca to help overcome this barrier
- Based on our successful www.metaboanalyst.ca, which is a user-friendly, comprehensive, high-performance web-based tool for analysis, visualization, and prediction (>85K hits/month)



TAKE AWAY

The deliverables from our proposed project provide a solution to pressing practical problems in the field of ecological and chemical risk assessment. They meet the needs of our diverse collaborators and end-users for tools that are in an accessible format while also being affordable, consistent, reliable, and capable of informing regulatory decision-making in a timely and ethical manner for effective chemicals management.

References

- Porter et al. 2014. Use of an avian hepatocyte assay and the avian toxchip polymerase chain reaction array for testing prioritization of 16 organic flame retardants. *ET&C* 33 (3): 573-582.
- Crump et al. 2015. Biochemical and Transcriptomic Effects of Herring Gull Egg Extracts from Variably Contaminated Colonies of the Laurentian Great Lakes in Chicken Hepatocytes. *ES&T* 49 (16): 10190-10198.

Notes

Briefing note 3.1 was developed for the Genome Canada-funded project "EcoToxChip: A Toxicogenomics Tool for Chemical Prioritization and Environmental Management" www.ecotoxchip.ca / @ecotoxchip
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