

***Effects of Persistent Organic Pollutants on
mRNA Expression in Avian Neuronal and
Hepatic Cells Using FRAP-PCR and SAGE***

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This Presentation

1. Overview of our research on the effects of Persistent Organic Pollutants (POPs) on birds
2. Two Current Studies:
 - Effects of a polybrominated diphenyl ether (PBDE) mixture on mRNA expression in cultured herring gull neuronal cells (**FRAP-PCR** and **Q-PCR**)
 - Effects of Dioxin (TCDD) on mRNA expression in cultured chicken liver cells (**SAGE**)
3. Future Directions

General Research Goals

- To understand the biochemical and molecular biological mechanisms which explain *how* and *why* avian species, differ in **sensitivity and response** to persistent organic pollutants (POPs)
- **WHY?** – There is a need for better methods for conducting ecological risk and hazard assessments on the effects of POPs on birds (and other taxa)

Persistent Chemicals - Persistent Problems?

- Dioxins
- Furans
- PCBs
- OC Pesticides
- Brominated Flame Retardants (e.g., PBDEs)
- Perfluorinated Organics (PFOS & PFOA)





Why herring gulls?



The importance of an indicator species

- Great Lakes herring gull monitoring program (est. 1974)
- Extensive experience with handling and collecting samples
- Year-round resident in the Great Lakes and a top-level predator

Our Traditional Approaches for Determining the Sensitivity of Wild Birds to Environmental Contaminants

- *Hypothesis-Driven – look for specific biochemical and physiological effects*
 - In the field (various biomarkers)
 - In the laboratory (egg injections and primary cell cultures)