Develop a Systems Approach to Characterizing and Predicting Thyroid Toxicity Using an Amphibian Model

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This research makes use of *in vitro* and *in vivo* approaches to understand and discriminate the compensatory and toxicological responses of the highly regulated HPT system. Development of an initial systems model will be based on the current understanding of the HPT axis and the compensatory processes involved in thyroid hormone homeostasis. Experiments have been conducted to better understand the relationships of the critical sub-components of the system. Particular emphasis has been placed on understanding the relative importance of gene expression in the pituitary, thyroid, and peripheral tissues under normal conditions and following exposure to chemicals known to interfere with thyroid hormone (TH) synthesis. These molecular changes are being linked to functional measurements of key hormones and enzymes that are part of the HPT pathway, all of which are being interpreted in the context of organismal-level effects.

The primary goal of this work is to develop a sufficient understanding of the HPT so that predictive models can be developed, testing protocols can be abbreviated, and efforts in inter-species extrapolation can be improved. One of the most likely uses for a HPT systems model is to aid in the understanding and discrimination of different modes of action. As such, this work further enables the development of quantitative structure activity relationships (QSARs) by providing a basis for sorting chemicals by mode of action, a necessary step prior to quantifying features of chemical structure associated with a particular type of toxicity. If these relationships can ultimately be established, then predictive models can be developed to rank chemicals for future *in vivo* testing.

	Poster	Title	Presenters Bio
Session I			
	1	ACToR: Aggregated Computational Toxicology Resource	R Judson
	2	DSSTox and Chemical Information Technologies in Support of Predictive Toxicology	A Richard
	3	Characteristics and Applications of the ToxRefDB In Vivo Datasets from Chronic, Reproductive and Developmental Assays	M Martin
	4	Literature Mining and Knowledge Discovery Tools for Virtual Tissues	A Singh
	5	ExpoCast: Exposure Science for Prioritization and Toxicity Testing	E Cohen Hubal
	6	Computational Approaches and Tools for Exposure Prioritization and Biomonitoring Data Interpretation	C. Tan
	7	Advanced Exposure Mertics for Chemical Risk Aanalysis	T. Collette
	8	The U.S. "Tox21 Community" and the Future of Toxicology	R Tice (NTP/NIEHS)
	9	Supported STAR Research Centers Advance the Field of Computational Toxicology	D Segal (NCER)
	10	UNC The Carolina Environmental Bioinformatics Center	F Wright (UNC)
	11	UMDNJ Environmental Bioinformatics & Computational Toxicology Center (ebCTC): Research Collaborations in Multi-Scale Modeling of Environmental Toxicants	B Welsh (UMDNJ)
	12	UNC Systms Biology - Carolina Center for Computational Toxicology	I Rusyn (UNC)
	13	UTH - The Texas-Indiana Virtual STAR Center; Data-Generating in vitro and in silico Models of Developmental Toxicity in Embryonic Stem Cells and Zebrafish	Eva M. Bondesson (UTH)
	14	Mechanistic Indicators of Childhood Asthma (MICA): A Systems Biology Approach for the Integration of Multifactorial Environmental Health Data	J Gallagher (NHEERL)
	15	Linkage of Exposure and Effects Using Genomics, Proteomics, and Metabolomics in Small Fish Models	T Collette for G. Ankley (NERL)
	16	Development of a Searchable Metabolite Database and Simulator of Xenobiotic Metabolism	J Jones (Athens)
	17	Risk Assessment of the Inflammogenic and Mutagenic Effects of Diesel Exhaust Particulates: A Systems Biology Approach	J Samet (NHEERL)
	18	Development of Microbial Metagenomic Markers for Environmental Monitoring	Jorge W. Santo Domingo (NERL)
	19	Develop a Systems Approach to Characterizing and Predicting Thyroid Toxicity Using an Amphibian Model	S Degitz (NHEERL)

<from meeting booklet>