Seminar Mission Statement

The study of environmental endocrine disruptors requires the integration of multiple disciplines including: physiology, toxicology, epidemiology, endocrinology, molecular/cellular biology, and reproductive biology. Because of the diversity of environmental contaminants, the multiplicity of their effects on physiology, and the complexity of species/environment interactions the cohesiveness and furthering of the field depends upon the development of a unifying conceptual umbrella. This will be an overarching focus of the seminar - integrating the observed impacts of endocrine disrupting contaminant exposures on the development of phenotypes while taking into consideration the context of the evolution.

Evolutionary developmental biology, or “evo-devo”, addresses the mechanisms by which changes in gene regulation cause changes in anatomy and function, and compares these mechanisms within an evolutionary framework. This framework contextualizes concepts such as developmental plasticity, discordance between genotype and phenotype via epigenetic mechanisms, intra- and interspecies variability in contaminant sensitivity, and environment-driven impacts on embryonic development. While the clear focus of the seminar will be environmental endocrine disruptors, presenters will be challenged to present their research results in a broader “evo-devo” perspective.

The goals of this seminar are:

- Provide a primer venue for trainees to present their research to their peers
- Receive supportive, constructive feedback from the distinguished faculty mentors
- Create linkages between diverse environmental endocrine disruption researchers
- Promote an integrated, holistic approach to the field through the introduction of evo-devo concepts, facilitating the application of these comparative tenets towards future research

Saturday Afternoon Keynote Lecture

Dr. Scott F. Gilbert, Swarthmore College

Dr. Gilbert will discuss how evolutionary-developmental biology and the concept of developmental plasticity contextualize, inform, and expand on environmental endocrine disruption studies. After will be a group discussion on the integration of evo-devo concepts into the environmental endocrine disruption field.
**Saturday Evening Science Session Topic**

Environmental endocrine disruption studies through evolutionary and developmental biology lenses

*Faculty Mentor: Dr. Frederick vomSaal, University of Missouri-Columbia*

This integrative session will first have a developmental focus on concepts such as: developmental programming, alternative phenotype trajectories, and transgenerational developmental effects via epigenetics. Second, the session will take an evolutionary focus on concepts such as: the effects of receptor-ligand co-evolution on signaling promiscuity, evolutionary-driven species-specific vulnerability to anthropogenic synthetic contaminants, and understanding non-anthropogenic, cross-species antagonistic signaling interactions.

**Sunday Morning Science Session Topic**

Biological Variance: Diverse study systems in context

*Faculty Mentor: Dr. David Crews, University of Texas at Austin*

The session will focus on individual variability of study subjects and the impacts of variability within a population on the results of endocrine-disrupting exposure studies. This session will address concepts such as alternative phenotypes, responders/non-responders within a population, and highly relevant environmental confounder: temperature, photoperiod, and intra-species interactions.

**Sunday Afternoon Science Session Topic**

Capitalizing on Complexity

*Faculty Mentor: Dr. Shanna Swann, University of Rochester*

We will address experimental and multivariate statistical approaches to better manage experimental designs and cope with intricate outcomes by incorporating concepts of natural and experimentally-induced variance into environmental endocrine disruption research.