**The evolution of sociality: Differences in molecular pathways between social and non-social cichlids**

**Constance O’Connor** (McMaster), **Susan Marsh-Rollo** (McMaster), **Sergio Cortez Ghio** (Universite Laval), **Kristina Hick** (McMaster, now University of Windsor), **Joanne Tan** (McMaster), **Marian Wong** (McMaster, now University of Wollongong), **Adam Reddon** (McMaster, now McGill University), **Sigal Balshine** (McMaster), **Nadia Aubin-Horth** (Universite Laval)

Uncovering the behavioural and mechanistic basis of sociality is crucial to understanding its evolution, but it is necessary to consider both the ecological and social context. Here, take advantage of the rapid and repeated radiation of African cichlid fishes to examine variation in molecular pathways that are proposed to underlie differences in social behavior. We compare molecular pathways among four species of social cichlids and four species of non-social cichlids. These fishes are all closely related, with similar mating behavior and ecological niches. Further, we compare specific social behaviors between one social and non-social species pair. Looking at expression of genes involved in the isotocin and vasotocin pathways (teleost homologues of oxytocin and vasopressin, respectively), we found that social species have higher brain gene expression of isotocin receptor 1, and lower expression of isotocin receptor 2. Social species also have higher brain gene expression of arginine vasotocin. At the behavioural level, we found individuals of a group-living species displayed higher social investment, higher social approach, and more frequent use of conflict resolution strategies than individuals of a non-grouping species. These results suggest that simple behaviors related to social motivation and conflict resolution are an important component of an overall group-living social system. Furthermore, we provide support for the notion that isotocin and vasotocin play a role in modulating social behavior in cichlid fishes. Together, the combination results contribute to our understanding of how social systems evolve at the level of both simple behaviors and the underlying molecular mechanisms.