

OR306*Genetic regulation of behavior in the clonal raider ant***Peter Oxley**, Daniel Kronauer

Mary Jane West-Eberhard's 'Ovarian Ground Plan Hypothesis' states that during the transition from subsocial to eusocial, the physiology and behavior expressed during the reproductive phase of the subsocial lifecycle became robustly expressed in the queen caste, while the physiology and behavior expressed during the brood care phase became expressed in the worker caste. Colonies of the clonal raider ant (*Cerpachys biroi*) consistently cycle between reproductive and brood care phases, which are synchronised to the development of the brood. Larvae hatch at the end of the reproductive phase and trigger the transition to brood care by inducing foraging behavior and suppressing ovarian activity in the adults. The reproductive phase, during which workers lay eggs and no foraging occurs, begins when the cohort of larvae pupates. The colony cycle of *C. biroi* thereby recapitulates the phasic lifecycle of the ancient subsocial ancestor, providing a unique opportunity to study the molecular regulation of reproductive physiology and worker behaviour. Using the newly sequenced genome of *C. biroi*, we performed qPCR of candidate genes previously shown to influence division of labour in social insects and found them to be dynamically regulated during the colony cycle of *C. biroi*. Using brood manipulation, it is possible to precisely regulate the transition between reproductive and brood care phases in discrete age cohorts of clonally related *C. biroi* workers. By collecting and RNA-sequencing individuals at specific intervals during this transition, we are creating transcriptional profiles of *C. biroi* brains associated with their phenotypic response to a well-defined social cue. So far, we have identified 100 genes that are differentially expressed between individuals in the reproductive vs. brood care phase. These transcriptional profiles will allow us to identify the molecular pathways that modulate behaviours that are fundamental to the division of labour in eusocial insects.