

Cologne Evolution Colloquium

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Molecular Basis of
Evolutionary Innovations

SFB 680

Maternal regulation of early embryogenesis in Speckled Wood butterflies (*Pararge aegeria*)

Using the Speckled Wood butterfly *Pararge aegeria* as the model species, we conducted the first comprehensive investigation of all the genes essential for butterfly oogenesis and in particular those used as maternal effect genes regulating embryonic development and extra-embryonic tissue formation. High throughput RNA sequencing of the ovaries and freshly laid eggs was used to identify all of these genes, and a combination of techniques (e.g. RT-PCR and in-situ hybridisation) was used to characterise the spatio-temporal expression patterns of a number of key genes involved in regulating 1) offspring body axis specification, 2) establishment of the next germ cell line, and 3) extraembryonic tissue specification. Although *P. aegeria* expresses a large number of genes orthologous to those expressed by other insects during oogenesis, the results clearly show that butterflies are highly divergent for these three developmental processes as well as in oocyte production and overall egg provisioning. Furthermore, *P. aegeria*, and butterflies in general, possess duplications of a number of developmental genes such as *nanos* and *zen* (the so-called Shx genes) with possible subfunctionalisation. Putative functions of these genes will be discussed. Possible reasons for the divergent nature of butterfly oogenesis and early embryogenesis will be discussed within an evolutionary ecological context.

Wednesday, January 27, 2016, 18:00
University of Cologne, Institute for Genetics
Seminar Room 0.46

Hosted by Maarten Hilbrant and Kristen Panfilio