



Speaker invited by: Manfred Gahr

Thursday, April 02, 2015, 13h, House 4, Lecture Room

Scope and Dimensions of Hormonal Maternal Effects

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Maternal effects are ubiquitous generators of diverse phenotypic variation. Many maternal effects are based on hormonal signalling from mother to offspring and among other hormones steroids are critical signals. Since steroids play key roles in vertebrate reproduction and developmental differentiation their transmission from mother to embryo links generations, suggesting co-evolution of actions in mother and offspring. Birds have played a major role in generating knowledge about hormone-mediated maternal effects at the level of their functions and to a lesser extent their mechanisms. One of the classes of steroids that are transmitted from the ovary into the avian egg during yolk formation are androgens. The doses of androgens in eggs vary at multiple levels - within the eggs of a clutch, among clutches, among populations, and among species. Variation at these different levels has been addressed in relation to adaptive functions, such as parental favouritism, differential allocation, local adaptation, and life history strategies. However, only once we understand the integration of different maternal effect pathways and the mechanisms operating in mother and offspring will we fully understand the scope and limitations of maternal effects in evolutionary processes. I will review work on maternal effects conducted in my lab and in collaboration with others, refer to critical studies from other labs, and discuss basic developmental mechanisms of pleiotropic actions by which maternal steroids might influence offspring phenotype during the earliest embryo stages

Who is Hubert Schwabl?

- 1981 PhD Ludwig-Maximilian University, Munich, Germany
- 1981 Alexander von Humboldt Postdoctoral Fellow, University of Washington, Seattle, USA
- 1985 Postdoctoral Research Associate, MPI Behavioural Physiology, Erling, Germany
- 1990 Assistant Professor, Rockefeller University, Millbrook, USA
- 1997 Associate Professor, Biological Sciences, Washington State University, Pullman, USA
- 2001 Professor, Biology, Biological Sciences, Washington State University, Pullman, USA

Selected publications:

- Schwabl, H. 1993. Yolk is a source of maternal testosterone for developing birds. PNAS USA 90: 11439-11441.
- Schwabl, H., D. Mock, and J. Gieg. 1997. A hormonal mechanism of parental favouritism. Nature 386: 231.
- Schwabl, H., M. G. Palacios, and T. E. Martin. 2007. Selection for rapid embryo development leads to higher embryo exposure to maternal androgens among passerine birds. Am. Nat. 170:196-206.
- Partecke, J. & Schwabl H. 2008. Organizational effects of maternal testosterone on reproductive behavior of adult house sparrows. Developmental Neurobiology. Published Online: DOI: 10.1002/dneu.20676.
- Groothuis, T.G. G. & H. Schwabl. 2008. Review: Hormone-mediated maternal effects in birds: mechanisms matter but what do we know of them? Philosophical Transactions of the Royal Society of London - Series B: Biological Sciences. 363(1497):1647-1661.
- Schwabl, H. & Groothuis, T.G.G. 2010. Maternal effects on behavior. Encyclopedia of Animal Behavior, Eds: M. D. Breed & J. Moore, ISBN: 978-0-08- 045337-8, p. 399-411.
- Egbert, J.R., M. F. Jackson, B. D. Rodgers, H. Schwabl. 2013. Between-female variation in house sparrow yolk testosterone concentration is negatively associated with CYP19A1 (aromatase) mRNA expression in ovarian follicles. Gen. Comp. Endocrinol. 183: 53-62.