

A PhD position is available to work on an international project involving laboratories at the University of Toronto and at the Institute of Functional Genomics in Lyon, France (see project description below). The successful candidate will be enrolled into the University of Toronto's PhD program, and will jointly work in the labs of Locke Rowe, Ashley Bruce, and Abderrahman Khila. Priority will be given to applications from Canadian Citizens. However, applications from international candidates are welcome.

<http://rowe.eeb.utoronto.ca/> <http://labs.csb.utoronto.ca/bruce/>
<http://igfl.ens-lyon.fr/equipes/a.-khila-developmental-genomics-and-evolution>

To apply: Send a CV, a cover letter describing skill relevant to this project, and names and contacts of three referees to:

locke.rowe@utoronto.ca

The role of ancient developmental genes in trait diversification. Males of the genus *Rheumatobates*

are known to have highly modified appendages that aid in the grasping of resistant females. The transition from the ancestral to the derived states occurs multiple times and in different ways, leading to a diversity of morphological outcomes (presence and location of antagonistic hooks and spines etc). The remarkable diversity in these antagonistic traits may be driven by two processes: a direct response to differences in female resistance to mating, and/or spatio-temporal variation in the expression of developmental genes, where a variety of outcomes are similarly effective. We have recently uncovered the role of an ancient developmental gene, *dll*, in controlling the sexually antagonistic modification of male grasping antennae in

Rheumatobates

rileyi. To determine the relative importance of these two alternative processes in generating sexual diversity, we are combining behavioural studies of antennal function with studies examining the role of *dll* in the diversification of these structures, in *Rhematobates spp.*

that span the range of modified antennae. For more details see references below.

References: Khila, A., Abouheif, E., and L. Rowe. 2014. Comparative functional analyses of Ultrabithorax reveal multiple steps and paths to diversification of legs in the adaptive radiation of semi-aquatic insects. Evolution. doi: 10.1111/evo.12444. <

<http://onlinelibrary.wiley.com/doi/10.1111/evo.12444/abstract>

> Khila, A., E. Abouheif and L. Rowe. 2012. Function, developmental genetics, and fitness consequences of a sexually antagonistic trait. Science 336: 585-589. Rowe, L., Westlake, K. & D.C. Currie. 2006. The functional significance of elaborate secondary sexual traits and their evolution in the water strider *Rheumatobates rileyi*. Canadian Entomologist 138:568-577. <

<http://rowe.eeb.utoronto.ca/files/2012/10/Rowe-et-al-2006-CanEnt.pdf>

> Arnqvist, G., and L. Rowe. 2002. Antagonistic coevolution between the sexes in a group of insects. Nature 415: 787-789. Westlake, K.P., Rowe, L. and Currie, D.C. 2000. Phylogeny of the water strider genus *Rheumatobates* (Heteroptera: Gerridae). Systematic Entomology 25:125-144. -- Institute of Functional Genomics Ecole Normale Supérieure de Lyon Université Claude Bernard, Lyon 46 Allée d'Italie 69007 Lyon, France office:

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