The lecture

Abstract

How do novel complex traits originate at the developmental level? And how do these traits become sensitive to the environment to evolve adaptive plasticity? I will report recent work that suggests that novel traits may originate via the recruitment of pre-existing gene regulatory networks. The work focuses on the origin and evolution of butterfly eyespots. Eyespots on nymphalid butterflies appear to have evolved from simple colored spots concurrently with the recruitment of several genes to the eyespot centers. In addition, eyespots originated as individuated units on the ventral hindwing, which later colonized additional wings and wing surfaces. We are currently trying to identify the primitive gene network that was recruited to make eyespots using transgenetic tools. The eyespot gene network in some lineages, such as Bicyclus anynana, evolved sensitivity to rearing temperature in an adaptive way. Temperature alters the size and brightness of specific eyespots. This plasticity evolved via modifications to the eyespot gene network and potentially to other networks involved in hormone synthesis and regulation. We are currently investigating how each of the components necessary for the origin of plasticity evolved and came together in a large tree of nymphalids.

Curriculum Vitae

1997: Ph.D. from Edinburgh University

2013-present: Associate Professor, National University of Singapore and Yale-NUS College

More at: http://www.lepdata.org/monteiro/

Related publications

Monteiro, A., and Podlaha, O. 2009
Wings, horns, and butterfly eyespots: How do complex traits evolve? Plos Biology 7: 209-216

Monteiro, A. 2012
Gene regulatory networks reused to build novel traits. Bioessays 34: 181-186

Oliver J. et al. 2012
A single origin for Nymphalid butterfly eyespots followed by widespread loss of associated gene expression. Plos Genetics 8: 1-7

Oliver J. et al. 2012
Nymphalid eyespot serial homologues originate as a few individualized modules. Proc. R. Soc. B 281: 1-8
Registration details

Register by sending an email to:

Brigitte Ferauge  
brigitte.ferauge@uclouvain.be
with your name and institution

For PhD-students:

We are seeking for highly motivated PhD-students to prepare the discussions. If you are interested, please send an email to camille.turlure@uclouvain.be

Lecture preparation: 1 credit  
Participation to the lecture: 1 credit

Deadline for registration:

23th of February 2015

Participation fee:

FREE

Number of participants is not limited. Registration is mandatory.

Hope to see you there!  
The organisers  
Camille Turlure and Caroline Nieberding

How to get to the lecture

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Louvain-la-Neuve

Place Croix du Sud

Carnoy Building

Room B059