



Newsletter August 2013

Welcome to the 1st edition of the PopGen ALUMNI newsletter! We will inform our growing alumni community 4 times per year about recent events and upcoming activities and will feature a short report of one of our former PopGen members in each edition. We hope to be able to organise a re-union meeting in 2014.

Recent events

In May, six **SAB members** (Brian Charlesworth, Laurent Excoffier, Simon Tavaré, John Parsch, Andy Clark and Jean-Michel Gibert) visited our students and faculty for two full days of presentations, discussions and socialising.

Our most recent visitor was **Mads Fristrup Schou**, PhD student of the Loeschcke group at the section of Integrative Ecology and Evolution at Aarhus University, Denmark. He uses experimental evolution to assess the evolutionary potential of *Drosophila melanogaster* as a response to increasing temperatures. In collaboration with PhD students, postdocs and faculty of the Vienna Graduate School of Population Genetics he analysed genomic data obtained from the experimental evolution project.

Our next guest (August) will be **Chris Willett** who spent his sabbatical with us for half a year in 2012. Chris is an associate professor and investigates the nature of genetic variation that underlies speciation and adaptation at the **University of North Carolina at Chapel Hill**. In collaboration with members of the Vienna Graduate School of Population Genetics, he will continue to study the genes that interact deleteriously to generate postzygotic reproductive isolation in a copepod system. He also looks at thermal tolerance and its potential interactions with reproductive isolation.

New associated faculty

Two new faculty members were associated recently. We welcome **Alex Kalinka** (Max Planck Institute of Molecular Cell Biology and Genetics, Dresden) and **Angela Hancock** (Mathematics and BioSciences Group at the University of Vienna).

Alex will join us in January 2014. His research focuses on understanding how ecological circumstances drive the evolution of development in strains and species of *Drosophila*, and ultimately how these micro-evolutionary changes might culminate in macro-evolutionary changes at the morphological level.

Angela is interested in quantitative trait evolution. In particular, her research focuses on examining the genetic basis of adaptation to the environment. Ongoing projects aim to clarify the role of rare variants in adaptation, to examine how adaptation occurs in systems of interacting genes, and to better understand specific cases of adaptation using modeling and experimental approaches.

Alumni careers

We're happy that our graduates as well as our former faculty landed great positions at excellent institutions!

Former faculty:

Alistair McGregor moved to **Oxford Brookes University** in April 2011 and established his group around the Evolution of Animal Development and Morphology at the Department of Biological and Medical Sciences. PhD student **Saad Arif** moved along and will soon finish his PhD.

Web: http://mcgregor-evo-devo-lab.net/McGregor_lab/home.html

Thomas Flatt left Vienna in November 2012 to accept a position as SNSF Professor at the Department of Ecology and Evolution (**University of Lausanne**).

Web: http://www.unil.ch/dee/page94630_en.html

Ines Hellmann moved to Munich in May 2013 where she works with Prof. Wolfgang Enard at the Anthropology and Human Genetics Section of **LMU's** Bio Center at Martinsried.

Web: <http://humangenetik.bio.lmu.de/index.html>

Former associated faculty member **Kristan Schneider** accepted a professorship at the University of Applied Sciences in Mittweida (Germany).

Web: <https://www.mni.hs-mittweida.de/professoren/mathematik/prof-schneider.html>

Former students:

Corinna Hopfen (Advisors Alistair McGregor/Christian Schlötterer) defended her thesis "Analysing the genetic basis of morphological variation in *Drosophila*" in May 2012. She now works as postdoc with Linda Partridge at the **MPI for Biology of Ageing** in Cologne.

Web: <http://www.age.mpg.de/the-science/research-labs/partridge/?type=1>

Claudia Bank (Advisors Joachim Hermisson/Christian Schlötterer) defended in July 2012 (Thesis title: "The limits to parapatric speciation"). Claudia moved to

Lausanne to work as postdoc with Jeff Jensen at **EPFL** and will spend a research fellowship at the Simons Institute for the Theory of Computing at UC Berkeley in spring 2014.

Web: <http://jensenlab.epfl.ch/page-91723-en.html>

Florian Clemente (Advisors Claus Vogl/Christian Schlötterer) defended his thesis “A study of the evolutionary forces acting on putatively neutrally evolving DNA sequences in *Drosophila*” in December 2012. He recently joined the group of Toomas Kivisild at the **University of Cambridge** as postdoc.

Web: <http://www.bioanth.cam.ac.uk/tkivisild.html>

Martin Kapun (Advisors Christian Schlötterer/Thomas Flatt) had his defense in June 2013 (Thesis title “The genetic basis of adaptive evolution in *Drosophila melanogaster*”). Martin is a Postdoc with Thomas Flatt at the **University of Lausanne**.

Web: http://www.unil.ch/dee/page94630_en.html#1

Alumni lab portraits

In the upcoming issues of ALUMNI News we will feature brief reports about PopGen’s graduate and faculty alumni.

Former faculty **Alistair McGregor** opens the series:

“Since moving from Vienna to Oxford, we have continued to focus on combining Evolution and Development and Population Genetics to investigate the genetic basis of morphological differences within and between *Drosophila* species. We have also expanded our research on spiders and are building genomic resources to study the development of these animals further. We really benefitted from the stimulating interdisciplinary environment at the Vienna Graduate School of Population Genetics, including great discussions during flymeeting and the world class seminar series.”



Alistair's lab: Evolution of Animal Development and Morphology
 Department of Biological and Medical Sciences
 Oxford Brookes University
http://mcgregor-evo-devo-lab.net/McGregor_lab/home.html

Out of sight, out of mind? Experiences of our students abroad

Many of our students choose to spend 3 month in foreign labs during their study time. In each of the Newsletters one of them tells us about their experiences.

Nicola De Maio (advisors Carolin Kosiol and Christian Schlötterer) was hosted as guest student at the **University of California Berkeley** from August to November 2011:

"I was abroad for 3 months and 10 days in Berkeley, California, USA, within the group of Ian Holmes. I worked on empirical codon Hidden Markov Models (ecHMM) for variation in selection and mutation rates. I also worked on phylogenetic/population genetic models.

During my time at UC Berkeley I learnt a lot of programming tricks, in particular from students of the group, such as Oscar Westesson. It was also very impressive to witness the high level of the weekly meetings, and to receive comments from Rasmus Nielsen who's also based in Berkely."

When asked about fun things that he remembers, Nicola mentioned that he found it amusing to watch deers munching on plants just outside his office building. Does Nicola have any pictures for the ALUMNI News? **"None, I did not bring a camera, sorry ☺"**

Upcoming events

The 2013 **introductory course** will be held in September while the advanced units will be taught in October. This year, local participants will be joined by 13 early-stage researchers (ESRs) of the INTERCROSSING Marie Curie Training Network. We also receive more and more inquiries from international students and postdocs who request participation.

The **welcome event** for new PopGen students will be organised in September. Six new students will join us this year!

This year's **retreat** will be held at a new location after several memorable years at Feuerkogel (Upper Austria). We'll be spending the weekend of September 27-29 a bit more towards the South, at a hut village in Altaussee (Styria) with the beautiful lake close by and the Loser Mountain right beside.

Upcoming seminars

The seminar series for the upcoming winter term is in preparation. We already have confirmations from **Laura Rose, Mohammad Noor, Darren Obbard** and **Ville Mustonen**. As a teaser: **Hopi Hoekstra** signalled interest to come for a seminar talk as well.

Publications of our students

It's time to sum up our student's publications since DK kick-off in July 2010:

Peter M. Klepsatel, Martina Gáliková, Nicola De Maio, S. Ricci, C. Schlötterer, and T. Flatt (2013) Reproductive and post-reproductive life history of wild-caught *Drosophila melanogaster* under laboratory conditions. *J. Evol. Biol.* (in press)

Q. Long, F.A. Rabanal, D. Meng, Christian D. Huber, A. Farlow, A. Platzer, Q. Zhang, B.J. Vilhjalmsen, A. Korte, V. Nizhynska, V. Voronin, P. Korte, L. Sedman, T. Mandakova, M.A. Lysak, U. Seren, I. Hellmann, M. Nordborg (2013) Massive genomic variation and strong selection in *Arabidopsis thaliana* lines from Sweden. *Nature Genetics* (accepted)

Nicola De Maio, I. Holmes, C. Schlötterer and C. Kosiol (2013) Estimating Empirical Codon Hidden Markov Models. *Mol Biol Evol* 30 (3): 725-736

Florian Clemente and C. Vogl (2012) Evidence for complex selection on fourfold degenerate sites in *D. melanogaster*. *J Evol Biol.* 25 (12): 2582-95.

Daniel K. Fabian, Martin Kapun, V. Nolte, R. Kofler, P.S. Schmidt, C. Schlötterer and T. Flatt (2012) Genome-wide patterns of latitudinal differentiation among populations of *Drosophila melanogaster* from North America. *Molecular Ecology* 21(19):4748-69.

Florian Clemente and C. Vogl (2012) Unconstrained evolution in short introns? — An analysis of genome-wide polymorphism and divergence data from *Drosophila*. *J Evol Biol* 25(10):1975-90.

P. Orozco-terWengel, Martin Kapun, V. Nolte, R. Kofler, T. Flatt, C. Schlötterer (2012) Adaptation of *Drosophila* to a novel laboratory environment reveals temporally heterogeneous trajectories of selected alleles. *Molecular Ecology* 21(20):4931-41.

Daniel K. Fabian and T. Flatt (2012) **Life history evolution.** *Nature Education Knowledge* 3(8):24.

Claudia Bank, R. Bürger and J. Hermisson (2012) **The limits to parapatric speciation: Dobzhansky-Muller Incompatibilities in a continent-island model.** *Genetics* 191(3):845-63.

C. Vogl and **Florian Clemente** (2012) **The allele-frequency spectrum in a decoupled Moran model with mutation, drift, and directional selection, assuming small mutation rates.** *Theor Popul Biol* 81(3):197-209.

Claudia Bank, J. Hermisson and M. Kirkpatrick (2012) **Can reinforcement complete speciation?** *Evolution* 66(1):229-39.

N. Posnien, **Corinna Hopfen**, M. Hilbrant, M. Ramos-Womack, S. Murat, A. Schönauer, S.L. Herbert, M.D. Nunes, Saad Arif, C.J. Breuker, C. Schlötterer, P. Mitteroecker, A.P. McGregor (2012) **Evolution of eye morphology and rhodopsin expression in the *Drosophila melanogaster* species subgroup.** *PLoS One* 7(5):e37346.

Daniel K. Fabian and T. Flatt (2011) **The evolution of aging.** *Nature Education Knowledge* 2(11):9.

R. Kofler, P. Orozco-terWengel, **Nicola De Maio**, R. Vinay Pandey, V. Nolte, A. Futschik, C. Kosiol, C. Schlötterer (2011) **PoPoolation: a toolbox for population genetic analysis of next generation sequencing data from pooled individuals.** *PLoS One* 6(1):e15925.

R. Bürger and **Ada Akerman** (2011) **The effects of linkage and gene flow on local adaptation: A two-locus continent–island model.** *Theor Popul Biol* 80(4):272-88.

Peter Klepsatel and T. Flatt (2011) **The genomic and physiological basis of life history variation in a butterfly metapopulation.** *Molecular Ecology* 20(9):1795-8.

Martina Gáliková, **Peter Klepsatel**, G. Senti, T. Flatt (2011) **Steroid hormone regulation of *C. elegans* and *Drosophila* aging and life history.** *Experimental Gerontology* 46(2-3):141-7.

Martin Kapun, V. Nolte, T. Flatt, C. Schlötterer (2010) **Host range and specificity of the *Drosophila* C virus.** *PLoS One* 26;5(8):e12421.

Martina Gáliková and T. Flatt (2010) **Dietary restriction and other lifespan extending pathways converge at the activation of the downstream effector takeout.** *Aging* 2(7):387-9.

Have a good Summer!