



Newsletter December 2018

Welcome to the 17th edition of the PopGen ALUMNI newsletter!

Follow us on Twitter @PopGenViennaPhD

Do you know of suitable candidates for PopGen Vienna?

Our call for PhD students is open – please help us spread the word!

Application deadline: February 14, 2019

[\(Flyer for download on the website\)](#)

BIG news:

December 2018: FWF evaluation outcome

We're happy that our associated members **Robert Kofler, Christian Lexer** and **Barbara Wallner** were promoted to **full faculty** of the Vienna Graduate School of Population Genetics after the successful re-evaluation hearing by the FWF and an international reviewer panel. We're really proud that **THE DK WAS PROLONGED FOR ANOTHER 4 YEARS!** Congratulations and thank you to students, faculty and alumni for the efforts you put into the program from the start. We'll continue to provide excellent training for next generation PopGen PhD students!

Recent events and news

December 2018: Christmas Event

A merry crowd of 40 students, postdocs and faculty of the Vienna Graduate School of Population Genetics had a great night out for ice skating, followed by a hearty buffet dinner at a cosy restaurant that opened only for us. We enjoyed a fun and social closure of the successful year.



December 2018: Alumni career news

Congratulations to associated faculty alumna **Andrea Betancourt**, now at Univ. of Liverpool, on receiving a prestigious ERC Consolidator Grant!

December 2018: Prizes

Congratulations to **Gökce Aköz** on winning the 2018 Poster Challenge at Vetmeduni Vienna! Her poster on "Genome duplication in *Aquilegia* and the unique history of chromosome four" won the 1st prize award of 500 Euro.

Congratulations also to faculty alumna **Carolyn Kosiol** on receiving Vetmeduni's scientist of the year 2018 award (category non-clinical research).

November 2018: PhD defense

Derek Setter recently defend his thesis "Detecting signals of adaptive introgression" at University of Vienna. All the best wishes for your postdoc career in Edinburgh, Derek!

October 2018: faculty news

Congratulations to faculty member **Robert Kofler** on completing his habilitation procedure at Vetmeduni Vienna!

October 2018: visiting student

Shuwen Xia is a PhD student at the Animal Breeding and Genomic group of Wageningen University & Research (Netherlands). Her PhD project is part of the BINGO training network and revolves around genome-based selection for the improvement of natural enemies in biocontrol. Shuwen will spend 6 weeks at the Vienna Graduate School of Population Genetics. During her stay, she will work on RNA-seq data for a *Drosophila melanogaster* population in a

new temperature regime in collaboration with our PhD student **Sheng-Kai Hsu** (Schlötterer group).

October 2018: Alumni career news

PopGen Vienna alumna **Ana Marija Jakšić** received a prestigious Award of Excellence for outstanding dissertations, bestowed by the Federal Ministry of Education, Science and Research, for her thesis "Thermal plasticity of the *Drosophila* transcriptome". This is the second Award of Excellence among our DK graduates within 2 years. Congratulations!

October 2018: PhD retreat

This year's **retreat** led 32 participants (PhD students, postdocs, faculty and associated guests) to beautiful surroundings in the Alps. The autumn weather was mild and sunny at Altaussee, at the foot of the stunning Loser mountain. We enjoyed talks with plenty of discussion opportunities, an afternoon with hiking and climbing and evenings with good food, good company and admiring the milky way under perfect conditions.



September 2018: 10-Year Anniversary Symposium

PopGen Vienna turned 10! We celebrated this very special anniversary during a one-day **alumni symposium** on September 7, 2018 at Vetmeduni Vienna. Many of you - our former PhD students, group leaders and associated members - travelled to Vienna for the occasion from as far away as Australia. More than 80 participants listened to newest research highlights of PopGen Vienna Alumni and engaged in discussions and networking during the breaks. The event ended with a BBQ party among old and new colleagues who form the extended PopGen Vienna family. It was great to catch up with so many dear colleagues and friends!



August 2018: Alumni career news

Our alumna **Claudia Bank**, group leader of the Evolutionary Dynamics laboratory at the Instituto Gulbenkian de Ciência (IGC), was awarded an ERC Starting Grant - congratulations! *News just in: Claudia also received a 2018 EMBO installation grant. More congrats!*

Alumni lab portraits

We feature a brief report about one of PopGen's graduate and faculty alumni in every Newsletter. This time, PopGen Vienna alumna **Claudia Bank** gives us some insight into her group leader experience at the Instituto Gulbenkian de Ciência in Portugal:

"Starting my PhD in 2008, I was a student in the very beginning of the Popgen PhD Program. I did my PhD with Joachim Hermisson on "The limits to parapatric speciation", where I modeled the buildup of reproductive isolation at the beginning and the end of a speciation process. After my theoretical PhD I wanted to get my hands on actual data. Therefore, I decided to do a postdoc with Jeff Jensen at the EPFL in Lausanne from 2012 onwards. There, I got involved in a collaboration

with Dan Bolon, a biophysicist from the University of Massachusetts Medical School, who had developed a high-throughput method that consists of engineering targeted mutants in yeast and screening their fitness effects by means of deep sequencing of bulk competitions. Working with this type of data was great for a (previous!) theoretician. Firstly, the data were (relatively) clean and easy to handle. Secondly, there was plenty of potential to interpret the data with respect to evolutionary theory!

As my postdoc was going well, I felt comfortable working independently, and I was encouraged by my postdoc advisor, I started applying for faculty jobs (mostly in the US) already towards the end of my second postdoc year. After a couple of really interesting interviews during two interview seasons I accepted a job offer from the Gulbenkian Institute, which is a research institute located 20 km from Lisbon on the coastline of Portugal. It feels like a blink of an eye, but I have been a PI there for almost 3 years now...

Being a PI is... different, and awesome*. Where being a postdoc is fantastic because you can focus on your favorite research while already "knowing stuff", being a PI is all about time management, writing and editing, keeping work travel to a bearable level, and not getting distracted by the xth administrative email or task. Most importantly however, it is about building a team and outsourcing your ideas to students and postdocs, who bring in their own, complementary expertise, ideas, and approaches. This is a truly amazing experience, but it also comes with an unprecedented amount of responsibility for the careers of other people, not just your own. I am very lucky to be a PI in an extremely supportive environment, where my colleagues are always willing to share their experiences and help me develop solutions to the latest challenges.

After a heavy amount of grant writing in the first years of having my own group, I have recently been awarded an ERC Starting Grant, which secures my lab's funding for the next 5 years. This grant is an exciting opportunity to expand my group's research on fitness landscapes and epistasis across biological scales (e.g., within-gene, between-gene, within-pathway, within-population, between-species, ...). It allows us to both continue the theoretical and statistical work we have been doing, but also to add some specific experimental work in *E. coli* and influenza virus to learn more about the role of epistasis in drug-resistance evolution. I am currently looking for a PhD student, two postdocs, and a programmer to join the group in 2019. Therefore, if you read this text and are interested in any of these topics and one of the jobs, or if you know a student or postdoc who may be interested, please email me or direct these people to [my group's website](#) - more details on the call will be posted soon.

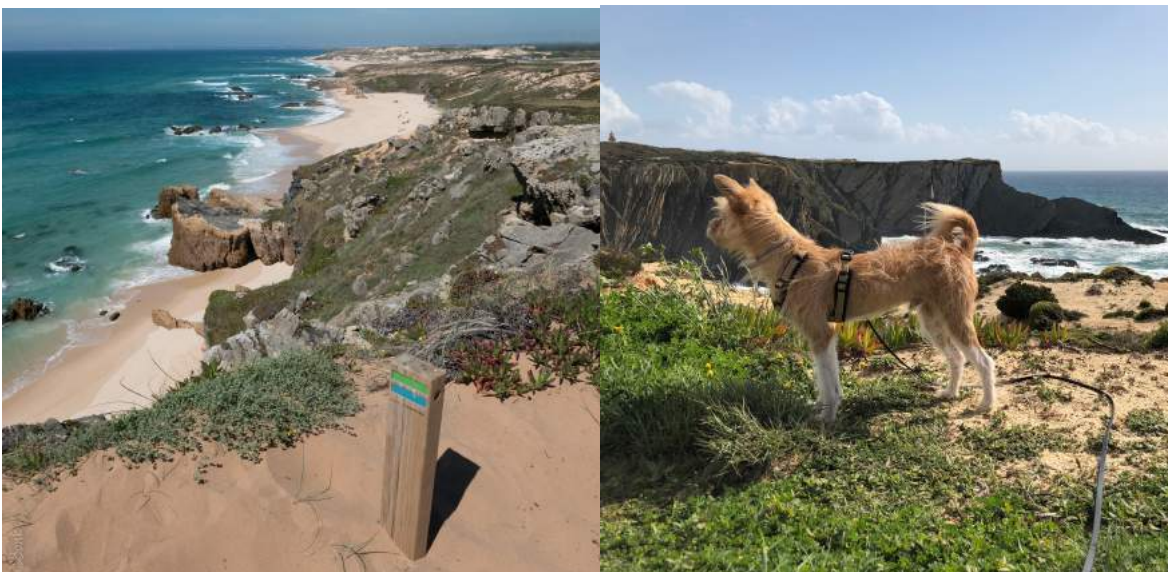
*I gave an interview about being a new PI to the Society of the Study of Evolution recently: <http://evolutionsociety.org/content/new-faculty-profiles/new-faculty-profile-claudia-bank.html>"



The Evolutionary Dynamics lab in June 2018.



Representation of the lab according to my lab members, Nov 2018.



Hiking impressions from the Portuguese coast.

Out of sight, out of mind?

Experiences of our students abroad

Many of our students choose to spend at least 3 months in foreign labs during their study time. **Sabine Felkel** (advisor Barbara Wallner) was hosted by Chris Tyler-Smith as guest student researcher at the Wellcome Sanger Institute:

“Working with the Y chromosome of the horse, my supervisor Barbara Wallner managed to build up her own scientific niche at Vetmeduni Vienna. When I joined “Team Equus” in February 2016, I basically started everything from scratch - the heart piece of my PhD project is the generation and analysis of my own Y-chromosomal assembly to trace sire lines in horses. My project showed nice progress, so the invitation to work with Pille Hallast on the human Y chromosome in Chris Tyler-Smith’s lab at the Wellcome Sanger Institute in Cambridge was a nice opportunity to work in a new, bigger team and a more competitive field. Data from the 1000 Genomes Project went already through several hands and it was up to me to get something new out of it. Due to its special structure and inheritance, the Y chromosome is often neglected or excluded from whole genome assemblies and studies. However, special effort of humankind was put into studying its own genome and even palindromic regions are well-described on the human Y. The azoospermia factor AZFc is spanning the palindromes one to three, which themselves consist of several ampliconic units. Deletions of these AZFc amplicons, leading to fertility problems in men, have been observed and postulated earlier. With coverage-based analysis, I screened 603 Y chromosomes for such deletions to get an idea how these are distributed across the human Y haplogroups and if there is a correlation with demography. Apart from learning new methods, which I partly already applied to the developing horse system, I immediately got to feel how things work in such a competitive field: just one month after I left the UK, David Page’s group published a paper covering what I did (and even more) during my four months at Sanger’s (Teitz et al., 2018). I was not disappointed to see that an essential part of what I did will not be published (at least not with my name on it; but we are in touch because some other results will be shown in Anders’ next paper), but glad to see that other people are also interested in what I was doing.

I really appreciate that I got the chance to experience a stay abroad during my time as a PhD student. I am Viennese and I have never worked abroad before and this was my chance to figure out a few things about myself: What do I wanna do and where do I wanna go? Can I establish myself in a completely new environment, without knowing anyone in advance? It was nice to realise: Yes, I can. Moreover, I enjoyed it. I immediately felt very wel(l)come by the group in the UK, I was invited to the Chinese New Year’s party at the group leaders’ home (Yali Xue is also part of the group and Chris’ wife) who were cooking a variation of delicious Asian food. I contributed to journal clubs, introduced the group to my horse project and got the chance to present new ideas and to talk about my interests at the retreat which I was also invited to. I made connections and already got a visitor here in Vienna. I was definitely amused by the weekly coffee-breaks where for different categories the top six users of the week were nominated. I am proud to announce that I was the most efficient user of computing time already after my first week.

My colleague Elena invited me to join a weekly yoga class and introduced me to the campus gym. I sometimes miss the after-lunch walks in the wetlands of the campus. I learned that it makes you even more productive to do sports and to enjoy breaks - it makes you happy, fills your batteries and clears your mind. Before I left, the group organised a goodbye-lunch and equipped me with a laserpointer - my future talks are saved. Long story short: totally worth it.”



Upcoming events

SMBE Satellite Meeting in Vienna, February 11-14: Towards an integrated concept of adaptation

Registration is free and open until the end of the year:

<https://www.vetmeduni.ac.at/SMBE-Satellite-Meeting/>

Upcoming seminars

The Winter Term seminar series is in full swing and includes talks by Frank Jiggins, Nick Priest, Steve Chenoweth, Daniel Tracey, Molly Przeworski, Stephen Wright, Julien Ayroles, Mia Levine, Chuck Langley, Roman Arguello and Bruno Lemaitre.

Have a cosy Xmas time, and a successful 2019!

Publications of our students in 2018

Fabian DK, Garschall K, **Klepsatel P**, Santos-Matos G, Sucena É, **Kapun M**, Lemaitre B, Schlötterer C, Arking R and Flatt T. Evolution of longevity improves immunity in *Drosophila*. *Evol. Lett.* (2018) doi: 10.1002/evl3.89

Hoellinger I, Pennings P and Hermisson J. Polygenic Adaptation: From sweeps to subtle frequency shifts. *bioRxiv* 450759. (2018)

Howie JM, Mazzucco R, **Taus T**, Nolte V and Schlötterer C. DNA motifs are not general predictors of recombination in two *Drosophila* sister species. *bioRxiv* 453639. (2018)

Bertl J, Ringbauer H and Blum MGB. Can secondary contact following range expansion be distinguished from barriers to gene flow? *PeerJ* 6, e5325. (2018)

Aköz G and Nordborg M. Genome duplication and reorganization in *Aquilegia*. *bioRxiv* 407973. (2018)

Vlachos C and Kofler R. MimicEE2: Genome-wide forward simulations of Evolve and Resequencing studies. *PLOS Comput. Biol.* 14(8), e1006413. (2018)

Mallard F, Nolte V, **Tobler R**, **Kapun M** and Schlötterer C. A simple genetic basis of adaptation to a novel thermal environment results in complex metabolic rewiring in *Drosophila*. *Genome Biol.* 19(1), 119. (2018)

Barghi N, **Tobler R**, Nolte V, **Jakšić AM**, Mallard F, Otte K, Dolezal M, **Taus T**, Kofler R and Schlötterer C. Polygenic adaptation fuels genetic redundancy in *Drosophila*. *bioRxiv* 332122. (2018)

Filiault DL, Ballerini ES, Mandáková T, Aköz G, Derieg NJ, Schmutz J, Jenkins J, Grimwood J, Shu S, Hayes RD, Hellsten U, Barry K, Yan J, Mihaltcheva S, Karafiátová M, Nizhynska V, Kramer EM, ... Nordborg M. The *Aquilegia* genome provides insight into adaptive radiation and reveals an extraordinarily polymorphic chromosome with a unique history. *Elife* 7. (2018)

Bergman J, Betancourt AJ and Vogl C. Transcription-associated compositional skews in *Drosophila* genes. *Genome Biol. Evol.* 10(1), 269–275. (2018)

Bergman J, **Schrempf D**, Kosiol C and Vogl C. Inference in population genetics using forward and backward, discrete and continuous time processes. *J. Theor. Biol.* 439, 166–180. (2018)

Felkel S, Vogl C, Rigler D, Jagannathan V, Leeb T, Fries R, Neuditschko M, Rieder S, Velie B, Lindgren G, Rubin C-J, Schlötterer C, Rattei T, Brem G and Wallner B. Asian horses deepen the MSY phylogeny. *Anim. Genet.* 49(1), 90–93. (2018)

Gaunitz C, Fages A, Hanghøj K, Albrechtsen A, Khan N, Schubert M, Seguin-Orlando A, Owens IJ, **Felkel S**, Bignon-Lau O, de Barros Damgaard P, Mitnik A, Mohaseb AF, Davoudi H, Alquraishi S, Alfarhan AH, Al-Rasheid KAS, ... Orlando L. Ancient genomes revisit the ancestry of domestic and Przewalski's horses. *Science* 360(6384):111-114. (2018)

Futschik A, **Taus T** and Zehetmayer S. An omnibus test for the global null hypothesis. *Stat. Methods Med. Res.* 96228021876832 (2018)

Horváth B and Kalinka AT. The genetics of egg retention and fertilization success in *Drosophila*: One step closer to understanding the transition from facultative to obligate viviparity. *Evolution.* 72(2), 318–336. (2018)

Kofler R, Senti K-A, Nolte V, **Tobler R** and Schlötterer C. Molecular dissection of a natural transposable element invasion. *Genome Res.* gr.228627.117. (2018)

Lirakis M, Dolezal M and Schlötterer C. Redefining reproductive dormancy in *Drosophila* as a general stress response to cold temperatures. *J. Insect Physiol.* 107, 175–185. (2018)

Mallard F, **Jakšić AM** and Schlötterer C. Contesting the evidence for non-adaptive plasticity. *Nature* 555(7698), E21–E22. (2018)

Pontz M, Hofbauer J and Bürger R. Evolutionary dynamics in the two-locus two-allele model with weak selection. *J. Math. Biol.* 76(1–2), 151–203. (2018)

See all publications [here](#)