



Newsletter April 2018

Welcome to the 15th edition of the PopGen ALUMNI newsletter!

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**Master's Program Evolutionary Systems Biology
Call for master students open until April 30th**

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Recent events and news

March 2018: Walter M. Fitch Award Finalist

Congratulations (and fingers crossed!) for **Ana Marija Jakšić** – she is one of 8 selected finalists to present a 15-minute talk in the Walter M. Fitch Symposium at this year's SMBE meeting in Yokohama. Based on these presentations, a winner will be chosen by an anonymous expert panel and awarded the Walter M. Fitch Prize (US \$2000). All finalists receive a one-year, online MBE subscription and travel support for attending the meeting.

Ana Marija will speak about how dopamine pleiotropy may be the reason behind pigmentation clines and how pleiotropy may mislead inferences of adaptive traits.

March 2018: Promotio sub auspiciis

During a solemn ceremony, PhD alumnus **Dominik Schrempf** graduated "sub auspiciis praesidentis rei publicae", Austria's highest possible honor for graduates who have excelled throughout their education and studies. Dominik is the first ever graduate of Vetmeduni Vienna to receive the prestigious ring of honor from the President of Austria. Congratulations, Dominik!

December 2017: Marshall Plan Scholarship

Congratulations to our PhD student **Martin Pontz** for receiving one of the prestigious Marshall Plan Foundation grants to support his research stay at Stanford University, USA. Martin is currently spending 3 months in the group of Marc Feldman as visiting student researcher to collaborate on multilocus models in population genetics.

December 2017: Christmas Event

The PopGen Christmas party was a sportive one this year: we learned Ceili and Set dance moves during a slightly chaotic but fun workshop at Vetmeduni Vienna. Afterwards we were treated to Indian food at a nearby restaurant to conclude the evening with 35 participants.



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 **Polina Novikova** gives us some insight into her postdoc experience in the Bioinformatics & Evolutionary Genomics group of Yves Van de Peer at the Department of Plant Systems Biology of VIB/Gent University (BE):

*“During my PhD in Vienna I described species relatedness and reticulation in *Arabidopsis* on the level of the entire genus, as well as evolutionary history of the allotetraploid *Arabidopsis suecica*. My current research perhaps can be summarized as studying molecular adaptation to polyploidy in plant and animal systems, which builds on the previous polyploidy research in *Arabidopsis*.*

*We are used to think of polyploidy as potentially adaptive event providing back up genetic material. However, polyploids have to adapt their cellular machinery to the whole genome duplication (WGD) itself. In the autotetraploids, crossovers may occur randomly between each copy during meiosis, compromising regular chromosomal segregation. Adapted to WGDs autoployploid plants allow only one crossover per chromosome, which leads to successful meiosis. Although recent WGDs have been described in animals, they occur rarely and usually such animals reproduce asexually. *Amphibia**

is the only exception among bisexually reproducing vertebrates with multiple independent occurrences of WGDs as in Australian burrowing frogs *Neobatrachus*.

My new project aims to provide the first description of adaptation mechanism to autotetraploidy in the animal kingdom using *Neobatrachus* frogs. The project includes (1) assembling the genome of *Neobatrachus pictus* which will provide only the third assembled genome for *Anura* clade, (2) assessing genetic variation for diploid and tetraploid *Neobatrachus* species using the existing collection of the South Australian Museum, (3) identification of potentially selected regions and adaptive changes in tetraploids compared to diploids. Integration of the findings in *Neobatrachus* and plants (*Arabidopsis*, *Mimulus*) hopefully will shed light on whether the mechanism of adaptation to the WGDs is universal or whether plants and animals use alternative ways.

The idea of this insane project was met with a great enthusiasm from my main collaborator Dr. Levi Yant (JIC, UK), who showed meiotic adaptation in autotetraploid *Arabidopsis arenosa*. Now the project is supported by an FWO postdoctoral fellowship and hopefully more to come.”

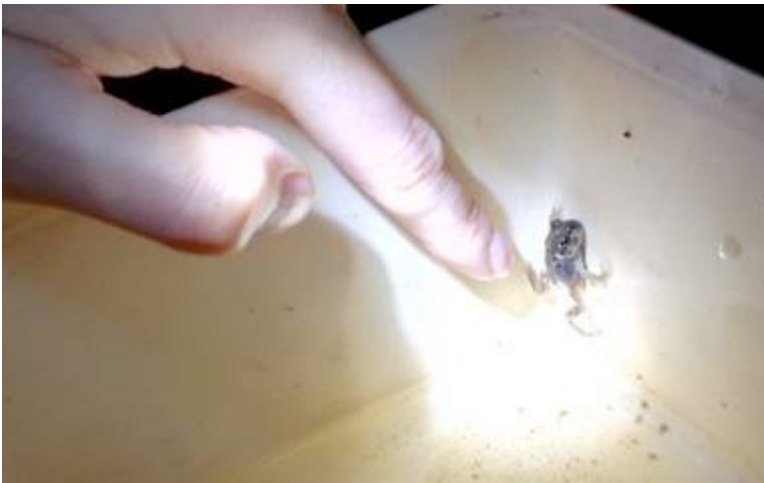


Fig. 1. *Neobatrachus pictus* hatchling, which is used for the reference genome assembly and annotation. December 2017, field trip close to Adelaide with Prof. Steve Donnellan from the South Australian Museum.



Fig. 2. Me in CSHL, taking a course on *Xenopus* gene editing. I hope my research will get to the point of functional validation of the candidate genes involved in molecular adaptation to polyploidy.

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. Currently, **Martin Pontz** (group Bürger) is in Stanford and **Sabine Felkel** (group Wallner) spends 4 months in Cambridge. We'll hear more about their experiences in one of the next Alumni News editions.

Upcoming events

The **SAB meeting 2018** will take place on May 7, 8 and 9 at lecture hall D, Vetmeduni Vienna. After the meeting ends on **May 9**, the biennial **mini-symposium** will feature talks by John Parsch, Brian Charlesworth, Nick Barton and Andy Clark.

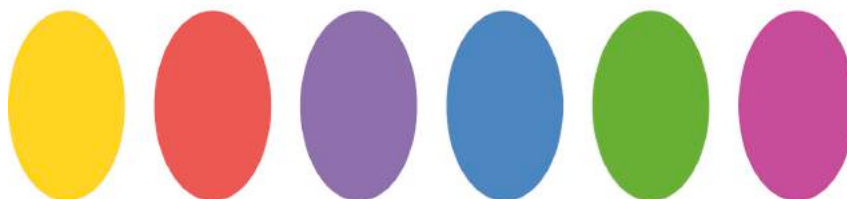
Save the date!

On September 7th, 2018, we'll celebrate 10 years of PopGen during an all-day symposium and a party with current members and alumni!

Upcoming seminars

The Summer Term seminar series has started and includes talks by Klaus Fischer, Daniel Matute, Judith Mank, Dan Hartl, Doris Bachtrog, Joachim Kurtz, John Wakeley, Daniel Tracey, Csaba Pal and Christian Sturmbauer.

Have a beautiful Spring!



Publications of our students so far in 2018

Mallard F, **Jaksic AM** and Schlötterer C. Contesting the evidence for non-adaptive plasticity. *Nature* 555(7698), E21–E22. (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, Mittnik 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* (80-.). eaao3297. (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)

- 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)
- Bergman J, Betancourt AJ and Vogl C.** Transcription-associated compositional skews in *Drosophila* genes. *Genome Biol. Evol.* 10(1), 269–275. (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 (N. Y.)*. 72(2), 318–336. (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](#)