Dr. Milan Malinsky
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EMPLOYMENT HISTORY

Institute of Ecology and Evolution, University of Bern, Switzerland
Principal Investigator, SNSF Ambizione Grant **Apr. 2021 –**
- "Evolution of meiotic recombination and genomic divergence in percomorph fishes"

Zoological Institute, University of Basel, Switzerland
EMBO Postdoctoral Fellowship + SNSF postdoc **Oct. 2016 – Mar. 2021**
- Advisor: Prof. Walter Salzburger
- Initially funded by a personal EMBO fellowship, this then expanded into Prof. Salzburger's SNSF grant "The genomic basis of divergence and convergence in fish species-flocks"

Gurdon Institute, University of Cambridge, UK
Postdoctoral scientist **Oct. 2015 – Sep. 2016**
- Advisor: Prof. Eric Miska
- Continuing work on topics arising from my PhD

EDUCATION

Sanger Institute, University of Cambridge, UK
PhD in Mathematical Genomics **Oct. 2011 - Sep. 2015**
- **PhD defense 9th November 2015**
- Main advisor: Prof. Richard Durbin, co-advisor: Prof. Eric Miska
- Thesis: "Genomic diversity and speciation in East African cichlid fish"

Department of Applied Mathematics, University of Cambridge, UK
Master's (MPhil) in Computational Biology **Oct. 2010 - Aug. 2011**
Graduated with a distinction
- Course covering various approaches to working with quantitative biological data, from computational neuroscience, to systems biology, to statistical genetics.
- A three-month research project
  Dissertation: "*C. elegans chromatin proteins HPL-2 and LIN-13*"

University of Birmingham, UK
BSc Computer Science with Business Management, Class: I **Sep. 2007-Jun. 2010**
- Two thirds Computer Science, one third Business Management
- Final year project in the field of algorithms for medical imaging

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Continuing education:

EMBO Laboratory Leadership Course, Heidelberg, Germany **Sep. 2018**
- A three-day course covering e.g. leadership roles, team development, delegation, communication, feedback + coaching, negotiation, recruitment

Workshop on Molecular Evolution, MBL, Woods Hole, MA, USA **Jul. 2013**
- Ten-day course on molecular phylogenetics, population genetics, genomics

TEACHING ACTIVITIES

Workshops on Population and Speciation Genomics **Feb. 2016, 2018, 2020**
Co-organiser of two-week courses for ~70 scientists across all seniority levels
Running classes on UNIX introduction, inference of population structure and of population size
Working as a teaching assistant in the computer lab throughout the rest of the workshop

Phylogenomics Workshop - Physalia Courses **Nov. 2020**
Instructor on a one-week online course for ~25 scientist

APPROVED RESEARCH PROJECTS

"Evolution of meiotic recombination and genomic divergence in percomorph fishes", SNSF Ambizione Grant (954,789CHF), Apr. 2021 – Mar. 2025
Grant number: PZ00P3_193464; https://p3.snf.ch/project-193464

"Molecular basis of convergent evolution between cichlid fishes of lakes Malawi and Tanganyika", EMBO Postdoctoral fellowship (157,659CHF), Oct. 2016 – Sep. 2018
Grant number: ALTF 456-2016

"Genotype/phenotype relationships in fast evolving vertebrate species - African Lake cichlids as a model system", Wellcome Trust PhD studentship (£155,658 ≈ 200,000CHF), Oct. 2011 – Sep. 2015
Grant number: 097677/Z/11/Z; https://app.dimensions.ai/details/grant/grant.3640527

SUPERVISION OF JUNIOR RESEARCHERS

Formal supervisor role:
PhD project at University of Bern – main supervisor **Sep. 2021 – now**
Marion Talbi – "Evolution of recombination landscapes"

Master's research project at University of Cambridge **Mar. 2013 – Jul. 2013**
Joseph J. Hanly – "Evidence for functional evolution of a miR-99b target site in related species of cichlid fishes"

Informal supervision:
Training a new postdoc at the Sanger Institute **Apr. 2016**
Ian Wilson – Alignment, variant calling and other genomic analyses with a high-performance computing cluster

Supervising a research assistant at the Sanger Institute **Feb. 2014 – Apr. 2014**
Daniel James – Automating genome assembly pipelines

REVIEWING ACTIVITIES

Grant proposal review:
Austrian Academy of Sciences – DOC fellowship, May 2018

Manuscript reviews (18 manuscripts):

Current Biology	– 2x, Jan. 2017 and Feb. 2019 (with W. Salzburger)
Evolution	– 1x, Dec. 2021
Genome Biology and Evolution	– 2x, Nov. 2015, Nov. 2021
GigaScience	– 2x, Sep. 2018 and Feb. 2019
Journal of Evolutionary Biology	– 2x, Oct. 2020, Apr. 2021
Molecular Biology and Evolution	– 2x, Jul. 2020, Oct. 2021
Molecular Ecology	– 1x, Jul. 2018
Molecular Ecology Resources	– 2x, Aug. 2016 and Jun. 2018
Nature Ecology and Evolution	– 1x, Sep. 2018
PLoS Genetics	– 2x, Sep. 2019, Dec. 2020
Science	– 1x, Aug. 2016 (with E. A. Miska)

Reviewing workshop applications:
Together with a panel of co-directors, selecting participants for the Workshop on Population and Speciation genomics, based on CVs and cover letters – Sep. 2017 and Sep. 2019

PRIZES, AWARDS, FELLOWSHIPS

EMBO Postdoctoral fellowship **Oct. 2016 – Sep. 2018**

Wellcome Trust PhD studentship **Oct. 2011 – Sep. 2015**
- See "Approved research projects"

BBSRC Master's Studentship - £18,151 (≈23,000 CHF) **Oct. 2010 – Aug. 2011**
- Competitive studentship to fund the fees and living costs for my course in Cambridge

Ratcliffe Foundation Travel Award - £250 (≈300CHF) **Jun. 2010**

RESEARCH OUTPUT

Publications:

Peer reviewed:

1. Vernaz, G., **Malinsky, M**., Svardal, M., Du, M., Tyers, A. M., Santos, M. E., Durbin, R., Genner, M. J., Turner, G. F. & Miska, E. A. (2021) Mapping Epigenetic Divergence in the Massive Radiation of Lake Malawi Cichlid Fishes. **Nature Communications**, 12, 5870. doi: https://doi.org/10.1038/s41467-021-26166-2.
2. Svardal, H., Salzburger, W. & **Malinsky, M.** (2021) Genetic Variation and Hybridization in Evolutionary Radiations of Cichlid Fishes. **Annu. Rev. Anim. Biosci.** 9, 55–79. doi: https://doi.org/10.1146/annurev-animal-061220-023129.
3. **Malinsky, M.**, Matschiner, M. & Svardal, H. (2021) Dsuite - Fast D-statistics and related admixture evidence from VCF files. **Molecular Ecology Resources**, 21, 584–595. doi: https://doi.org/10.1111/1755-0998.13265.
4. Ronco, F., Matschiner, M., Böhne, A., Boila, A., Büscher, H.H., El Taher, A., Indermaur, A., **Malinsky, M.**, Ricci, V., Kahmen, A., Jentoft, S. & Salzburger, W. (2021) Drivers and dynamics of a massive adaptive radiation in cichlid fishes. **Nature**, 589, 76–81. doi: https://doi.org/10.1038/s41586-020-2930-4.
5. Rhie, A., McCarthy, S. A. ... (44 others) ... **Malinsky, M.**, ... (72 others) ... Durbin, R., Phillippy, A. M. & Jarvis, E. D. (2021) Towards complete and error-free genome assemblies of all vertebrate species. **Nature**, 592, 737–746. doi: https://doi.org/10.1101/2020.05.22.110833.
6. Ciezarek, A., Ford, AGP., Etherington, G.J., Kasozic, N., **Malinsky, M.**, Mehta, T., Penso-Dolfine, L., Ngatunga, B.P., Shechonge, A., Tamatamah, R., Haerty, W., Di Palma, F., Genner, M.J. & Turner, G.F. (2021) Whole genome resequencing data enables a targeted SNP panel for conservation and aquaculture of Oreochromis cichlid fishes. **Aquaculture**, 737637. doi: https://doi.org/10.1016/j.aquaculture.2021.737637.
7. Patil, C., Sylvester, J. B., Abdilleh, K., Norsworthy, M. W., Pottin, K., **Malinsky, M.**, Bloomquist, R. F., Johnson, Z. V., McGrath, P. T. & Streelman, J. T. (2021) Genome-enabled inference of evolutionary divergence in brains and behavior. **Scientific Reports**, 11, 13016. doi: https://doi.org/10.1101/2020.10.12.336453.
8. Carleton, K. L., Conte, M. A., **Malinsky, M.**, Nandamuri, S. P., Sandkam, B. A., Meier, J. I., Mwaiko, S., Seehausen, O. & Kocher, T. D. (2020) Movement of transposable elements contributes to cichlid diversity. **Molecular Ecology**, 29, 4956–4969. doi: https://doi.org/10.1111/mec.15685.
9. Svardal, H., Quah, F. S., **Malinsky, M.**, Ngatunga, B. P., Miska, E. A., Salzburger, W., Genner, M. J., Turner, G. F., Durbin, R. (2020) Ancestral hybridisation facilitated species diversification in the Lake Malawi cichlid fish adaptive radiation. **Mol. Biol. Evol.** 37, 1100–1113. doi: https://doi.org/10.1093/molbev/msz294
10. **Malinsky, M.**, Svardal, H., Tyers, A. M., Genner, M. J., Turner, G. F. Miska, E. A., Durbin, R. (2018) Whole genome sequences of Malawi cichlids reveal multiple radiations interconnected by gene flow. **Nature Ecology & Evolution** 2, 1940–1955. doi: https://doi.org/10.1038/s41559-018-0717-x.
11. **Malinsky, M**., Trucchi, E., Lawson, D. J. & Falush, D. (2018) RADpainter and fineRADstructure: Population Inference from RADseq data. **Mol. Biol. Evol.** 35, 1284–1290. doi: https://doi.org/10.1093/molbev/msy023.
12. **Malinsky, M.** and Salzburger, W. (2016) Environmental context for understanding the iconic adaptive radiation of cichlid fishes in Lake Malawi. **PNAS**, 113, 11654–11656. doi: https://doi.org/10.1073/pnas.1614272113.
13. **Malinsky, M.**, Challis, R., Tyers, A. M., Schiffels, S., Terai, Y., Ngatunga, B. P., Miska, E. A., Durbin, R., Genner, M. J., Turner, G. F. (2015). Genomic islands of speciation separate cichlid ecomorphs in an East African crater lake. **Science** (New York, N.Y.), 350(6267), 1493-8. doi: https://doi.org/10.1126/science.aac9927.
14. Brawand, D., Wagner, C. E., Li, Y. I., **Malinsky, M.**, Keller, I., Fan, S., Simakov, O., Ng, A. Y., Lim, Z. W., Bezault, E., … (76 others) … and Di Palma, F. (2014). The genomic substrate for adaptive radiation in African cichlid fish. **Nature**, 513(7518), 375–381. doi: https://doi.org/10.1038/nature13726.
15. **M. Malinsky**, M. Jermyn, B. Pogue, and H. Dehghani (2010). "An Online Modeling and Image Reconstruction Tool for Optical Imaging Based on NIRFAST" in **Biomedical Optics and 3-D Imaging, OSA Technical Digest** , paper BSuD27; doi: https://doi.org/10.1364/BIOMED.2010.BSuD27.

Preprints:

1. Vernaz, G., Hudson, A. G., Santos, M. E., Fischer, B., Carruthers, M., Shechonge, A. H., Gabagambi, N. P., Tyers, A. M., Ngatunga, B. P., **Malinsky, M.**, Durbin, R., Turner, G. F., Genner, M. J. & Miska, E. A. (2021) Epigenetic Divergence during Early Stages of Speciation in an African Crater Lake Cichlid Fish. **bioRxiv**. doi: https://doi.org/10.1101/2021.07.30.435319.
2. **Malinsky, M.**, Simpson, J. T. & Durbin, R. (2016) trio-sga: facilitating de novo assembly of highly heterozygous genomes with parent-child trios. **bioRxiv** 20, 051516. doi: https://doi.org/10.1101/051516.

Contributions to international conferences:

Oral contributions:

1. **Malinsky, M.** "Evolution of genomes and meiotic recombination rates". **Biology 22 (2022), Basel, Switzerland.**
2. **Malinsky, M.** "Evolution of recombination rate landscapes along the genome". **MACSPro (Modelling and Analysis of Complex Systems and Processes) conference (2021), Moscow, Russia. Invited Keynote lecture.**
3. **Malinsky, M.** "Genetic Variation in Evolutionary Radiations of Cichlid Fishes". **Cichlid science conference (2021), Cambridge, UK.**
4. **Malinsky, M.** "Molecular basis of convergent evolution between cichlid fishes of lakes Malawi and Tanganyika". **Cichlid science conference (2019), Madrid, Spain.**
5. **Malinsky, M.**, Svardal, H., Vernaz, G., Miska, E. A., Salzburger, W., Durbin, R. "Genetic basis of functional differences between closely related species". **EMBO at Basel Life: Genomes in Biology and Medicine (2017), Basel, Switzerland.**
6. **Malinsky, M.**, Svardal, H., Genner, M. J., Turner, G. F., Durbin, R., and Salzburger, W. "Shared variation between Great Lakes: do they all use the same variation?" **Cichlid science conference (2017), Prague, Czech Republic.**
7. **Malinsky, M**., Trucchi, E., Lawson, D. J. & Falush, D. "RADpainter and fineRADstructure: Population Inference from RADseq Data" **Society for Molecular Biology and Evolution (SMBE) annual meeting (2016), Brisbane, Australia.**
8. **Malinsky, M.**, Tyers, A., Miska, E. A., Genner, M. J., Durbin, R, Turner, G. F. "Speciation in Lake Malawi and in Tanzanian crater lakes". **Cichlid science conference (2015), Graz, Austria.**
9. **Malinsky, M.**, Challis, R. J., Tyers, A., Miska, E. A., Genner, M. J., Durbin, R., Turner, G. F. "Speciation in cichlid fishes in Lake Malawi catchment" **Society for Molecular Biology and Evolution (SMBE) annual meeting (2015), Vienna, Austria.**
10. **Malinsky, M.** "Genomic diversity and speciation in East African cichlid fish". **Cambridge Evolutionary Genetics & Genomics Symposium (2015), Cambridge, UK.**
11. **Malinsky, M.**, Challis, R. J., Tyers, A., Miska, E. A., Genner, M. J., Durbin, R., Turner, G. F. "Islands of positive selection and speciation with gene flow in African crater lake cichlids". **Society for Molecular Biology and Evolution (SMBE) annual meeting (2014), San Juan, USA.**

Poster presentations:

12. **Malinsky, M.** and Matschiner, M. "c-genie - Assessing the impact of recombination on phylogenomic inference" **Society for Molecular Biology and Evolution (SMBE) annual meeting (2018), Yokohama, Japan.**
13. Malinsky, M. and Matschiner, M. "microRNA evolution in East African cichlids" **Society for Molecular Biology and Evolution (SMBE) annual meeting (2013), Chicago, USA.**
14. **Malinsky, M.** and Dehghani, H. "An Online Modeling and Image Reconstruction Tool for Optical Imaging Based on NIRFAST". **The Optical Society of America annual meeting (2010), Miami, USA.**

Outreach activities:

1. Cambridge University Museum of Zoology
   - I was responsible for creating the scientific content for the public display of the Lake Malawi cichlid fish collection in the museum

General contributions to science:

1. Co-organiser and co-director of the "Workshop on Population and Speciation Genomics" in Cesky Krumlov
   - Two-week specialist courses for ~70 scientists across all seniority levels (PhD, postdoc, faculty)
   - Instructor in 2016, co-directing the workshop in 2018, and also the upcoming workshop in 2020
   - http://evomics.org/2018-workshop-on-population-and-speciation-genomics-cesky-krumlov/
2. Cambridge University Museum of Zoology - Lake Malawi cichlid fish collection
   - Key role in establishing one of the largest Lake Malawi fish museum collections in the world (>1200 specimens, >200 species)
   - Planning and participating in the three-week field expedition in 2016, participating in the cataloguing in the museum
   - The full collection is accessible to researchers and used in teaching in Cambridge too. See e.g.: https://youtu.be/XYyu6ln_khQ; https://www.zoo.cam.ac.uk/news/teaching-and-the-museum-of-zoology

3. Cambridge Cichlid Browser
   - I set up and maintain a web based Interactive Genome Browser for the research community
   - Over 1,600 unique users (IP addresses) visiting more than two pages; source: Google Analytics
   - http://cichlid.gurdon.cam.ac.uk
4. Software package trio-sga: https://github.com/millanek/trio-sga (see the Publications - Preprints)
   - An extension of the SGA *de novo* genome assembly tool by Jared Simpson
   - Facilitating assembly of highly heterozygous genomes by using data from mother-father-offspring trios
5. Software package fineRADstructure: https://github.com/millanek/fineRADstructure
   - Widely used population structure inference package, using clustering code from fineSTRUCTURE
   - Publication in Molecular Biology and Evolution (see "Publications in peer-reviewed journals")
6. Software package D-suite: https://github.com/millanek/Dsuite
   - Widely used package for detecting signatures of gene-flow among species or among populations from genomic polymorphism data
   - Publication in Molecular Ecology Resources (see "Publications in peer-reviewed journals")
7. Co-author, with Michael Matschiner of the c-genie software: https://github.com/millanek/c-genie
   - Simulation-based software for assessing the impact of recombination on phylogenomic inference
   - Presented by me at the SMBE annual meeting in 2018
8. Generated two high quality *de novo* genome assemblies from long read (PacBio) data:
   - *Astatotilapia calliptera* - http://www.ensembl.org/Astatotilapia_calliptera/Info/Index
   - *Simochromis diagramma* - https://www.ncbi.nlm.nih.gov/assembly/GCA_900408965.1/
9. microRNA gene annotation for five cichlid fish genomes
   - e.g. http://www.mirbase.org/summary.shtml?org=mze