Laetitia G.E. Wilkins

Address: Carl-Schurz-Str. 41, DE-28209 Bremen, Germany Contact: +49 176-293-77940, megaptera.helvetiae@gmail.com

Blog, Twitter: https://laetitia.schmid.se, @M helvetiae

EDUCATION -

Ph.D. in Ecology & Evolution, University of Lausanne, Switzerland

2010/10/01 - 2014/11/07

Thesis: Diversity of bacterial symbionts on salmonid eggs: genetic and environmental effects Supervised by Prof. Claus Wedekind & Dr. Luca Fumagalli. I earned diplomas in Ecology & Evolution, StarOmics CUSO, and Population Genomics (GPA = 4.0; Summa cum laude).

Master of Science in Biology, Stockholm University, Sweden

2008/09/01 - 2010/06/12

Thesis: Female mating preferences and the MHC in humpback whales, Major: Evolutionary Genetics Supervised by Prof. Per Palsbøll & Dr. Martine Bérubé (GPA = 4; Summa cum laude)

Bachelor of Science in Biology, University of Bern, Switzerland

2005/09/01 - 2008/06/30

Thesis: *Y-chromosomal phylogenies of Microtus arvalis*, Major: Population Genetics Supervised by Prof. Gerald Heckel & Prof. Laurent Excoffier (GPA = 3.7; *In signi cum laude*)

WORKING EXPERIENCE-

Since 1st of May, 2020

Project Leader in Nicole Dubilier's Department of Symbiosis Max Planck Institute for Marine Microbiology, Bremen, Germany

Ecology and evolution of marine microbial symbioses in gutless oligochaetes and lucinid clams (ongoing).

Since 1st of June, 2020

Co-Chair of the ISME (International Society for Microbial Ecology) Early Career Scientist Committee (global)

- Establishment of a virtual platform where early career scientists are invited to present their conference talks that had been cancelled due to COVID-19: https://www.isme-microbes.org/lets-go-viral (ongoing)
- Formation of an *ad hoc* diversity committee with the goals of (i) increasing the breadth of voices in the decision making process of conference organization, (ii) highlighting the full diversity of our scientific society and reinforcing support for underrepresented scientists globally, and (iii) deciding on action items to take to the board to change policy on increasing diversity and inclusion #UnityInDiversity https://www.isme-microbes.org/unity-diversity (ongoing)

Since 1st of June, 2014

External Fish & Wildlife Consultant, Canton Grisons, Switzerland

Population genetic informed management of wild fish populations, fishing regulations, and hatchery practices in my home canton Graubünden, Switzerland (ongoing).

2018/09/01 - 2020/04/30

Gordon & Betty Moore Foundation Postdoctoral Researcher, UC Davis, USA

Postdoc in Prof. <u>Jonathan Eisen's lab</u>. Funded by the Gordon & Betty Moore Foundation. Conception of a research program, **#istmobiome**, in collaboration with the Smithsonian Tropical Research Institute (STRI) in Panamá. Goal: Understanding how the closure of the Isthmus of Panamá affected the evolution and diversification of marine microbial symbioses: https://istmobiome.net/

2017/02/01 - 2018/08/31

Founder & Co-President of the Berkeley Spouses, Partners and Parents Association (BSPPA), UC Berkeley, USA

Establishment of a university-wide association for postdoctoral and visiting researchers and student scholars with families. We organized workshops on work-life-balance and how to navigate your life in the USA (health system, adult education for spouses, career counseling, housing, childcare, and family-friendly STEM events): https://bsppa.berkeley.edu/

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2016/09/01 – 2018/08/31 SNSF Postdoc | University of California, Berkeley, USA

Postdoc in Prof. Stephanie Carlson's lab.

Funded by the Swiss National Science Foundation (SNSF): Host-microbiome interactions and life-history strategies in *O. mykiss* (rainbow trout) and in the endangered Sierra Nevada yellow legged frog *Rana sierrae*, (both host systems are native to California).

Maternity leave: 2015/11/19 - 2016/08/31

2014/12/01 – 2016/04/30 SNSF Postdoc | University of Lausanne, Switzerland

First assistant (Postdoc) and project leader in Prof. <u>Claus Wedekind's lab</u> in the SNSF-funded project 182265: "The potential consequences of unintended artificial selection on population fitness: combining laboratory experiments with large-scale field studies on salmonids"

Maternity leave: 2012/09/15 - 2013/01/30

Internship in the Department of Molecular Diagnostics (MDx) in Prof. Anthony Rossini's group: Statistical analysis of gene expression (RNA-seq) data of lung cancer and review about reproducibility

ACHIEVEMENTS -

2020 Assembly of #UnityInDiversity ad hoc committee to promote equity and diversity in our scientific community

2020 Cost extension for #istmobiome project (\$100,000)

2018 Foundation of #istmobiome project: International program to study the evolution of symbioses

2018 Travel award for National Postdoc Association meeting in Cleveland #NPA2018 (\$2000)

2016 Postdoc Mobility Fellowship from Swiss National Science Foundation (126,000 CHF)

2013 Travel Award CUSO Population Genomics Program – Evolution Conference, Snowbird, UT, USA (\$2000)

2010 Ph.D. Fellowship in Life Sciences at University of Lausanne, Switzerland (140,000 CHF)

SUMMARY OF ACADEMIC ACTIVITIES –

- Mentoring of 10 graduate students and 9 undergraduate students since 2012 (see details on page 5)
- ♦ 17 peer-reviewed and accepted publications (see details on page 3)
- ◆ 29 oral presentations at international conferences (of which 13 were invited talks, see details on page 6)
- Organization of conferences and workshops
 - **Unity in Diversity**: Virtual microbial ecology conference (public and free) to fill the void caused by the cancellation of #ISME18, November 11th & 12th 2020: https://www.isme-microbes.org/speakers-uid
 - *Use of Microbiomes for Population Management:* Symposium for joint meeting of American Fisheries Society and Wildlife Society, Reno, Nevada, USA, October 2nd, 2019. Organized together with Dr. Obed Hernandez-Gomez, UC Berkeley. See summary here: doi: 10.1002/fsh.10373
 - *Marine Microbial Symbiosis Workshops*: Organized together with Dr. Matthieu Leray and Dr. Jarrod Scott at Bocas del Toro, Smithsonian Tropical Research Institute, Panamá (STRI; Dec 3-8, 2018).
 - Matt Leray and I organized a second workshop, funded by the Gordon and Betty Moore Foundation and STRI provost John Davis (same place; Dec 1-7, 2019) https://stri.si.edu/microbiome-workshop.
 - *ESEB (European Society of Evolutionary Biology)* Congress: Organizing committee responsible for audio-visual systems, Lausanne, Switzerland (10th 14th of August 2015)
- ♦ Organization of field expeditions in California, Central America, and the Mediterranean Sea
- ♦ Writing for scientists and the public
 - for The Molecular Ecologist: https://www.molecularecologist.com/
 - for the *International Society of the Study of Evolution*: https://ssecommunityblog.org
 - for our project website: https://istmobiome.net/
 - and on my personal blog: https://laetitia.schmid.se/ and Twitter: @M helvetiae

COMPLETE PUBLICATION LIST-

My ORCID ID: 0000-0003-3632-2063; https://scholar.google.at/citations?user=OZHrP3kAAAAJ&hl=de 17 published peer-reviewed articles with an h-index of 8

- 17. Allard, S., Costa, M., Bulseco, A., Helfer, V., **Wilkins,** L. G. E., Hassenrück, C., Zengler, K., Zimmer, M., Erazo, N., Rodrigues, J., Duke, N., Melo, V., Vanwonterghem, I., Junca, H., Makonde, H., Jimenez, D., Tavares, T., Fusi, M., Daffonchio, D., Duarte, C., Peixoto, R., Rosado, A., Gilbert, J., and Bowman, J. 2020. Introducing the Mangrove Microbiome Initiative: Identifying microbial research priorities and approaches to better understand, protect, and rehabilitate mangrove ecosystems. **mSystems** 5(5): 300658-20. doi:10.1128/mSystems.00658-20 [OA = Open Access]
- 16. Dahlhausen, K. E., Jospin, G., Coil, D. A., Eisen, J. A., and **Wilkins**, L. G. E. 2020. Isolation and sequence-based characterization of a koala symbiont: *Lonepinella koalarum*. **PeerJ** 8: e10177. doi:10.7717/peerj.10177 [OA]
- 15. **Wilkins**, L. G. E., Matthews, K. R., Steel, Z. L., Nusslé, S. C., and Carlson, S. M. 2019. Population dynamics of *Rana sierrae* at Dusy Basin: Influence of non-native predators, drought, and restoration potential. **Ecosphere** 10(11): e02951. doi:10.1002/ecs2.2951 [OA] Cited 1 time.
- 14. **Wilkins***, L. G. E., Leray*, M., O'Dea, A., Yuen, B., Peixoto, R., Pereira, T. J., Bik, H. M., Coil, D. A., Duffy, J. E., Herre, E. A., Lessios, H., Lucey, N. M., Mejia, L. C., Rasher, D. B., Sharp, K., Sogin, E.M., Thacker, R. W., Vega Thurber, R., Wcislo, W. T., Wilbanks, E. G., and Eisen, J. A. 2019. Host-associated microbiomes drive structure and function of marine ecosystems. **PLoS Biology** 17(11): e3000533. doi:10.1371/journal.pbio.3000533 (*shared first authorship) [OA] Cited 11 times.
- 13. **Wilkins**, L. G. E. 2019. Can inter-species affairs in the dark lead to evolutionary innovation? **Molecular Ecology** 28(21): 4693-4696. doi:10.1111/mec.15262 (invited News and Perspectives article) [OA] Cited 1 time.
- 12. Selmoni, O., Maitre, D., Roux, J., **Wilkins**, L. G. E., Marques da Cunha, L., Vermeirssen, E. L. M., Knörr, S., Robinson-Rechavi, M., and Wedekind, C. 2019. Sex-specific changes in gene expression in response to estrogen pollution around the onset of sex differentiation in grayling (Salmonidae). **BMC Genomics** 20(583). doi:10.1186/s12864-019-5955-z [OA] Cited 5 times.
- 11. **Wilkins***, L. G. E., Ettinger*, C. L., Jospin, G., and Eisen, J. A. 2019. Metagenome-assembled genomes provide new insight into the microbial diversity of two thermal pools in Kamchatka, Russia. **Scientific Reports** 9(3059). doi:10.1038/s41598-019-39576-6 (*shared first authorship) [OA] Cited 20 times.
- 10. Ettinger, C. L., **Wilkins**, L. G. E., Dahlhausen, K. E., Ghose, S. L., Oberbauer, D., Eisen, J. A., and Coil, D. A. 2018. Even superheroes need help sometimes: three incredible tales of microbial symbiosis. **Frontiers for Young Minds** 6(50). doi:10.3389/frym.2018.00050 [OA]
- Marques da Cunha*, L., Wilkins*, L. G. E., Menin, L., Ortiz, D., Vocat-Mottier, V., and Wedekind, C. 2018. Consumption of carotenoids is not increased by bacterial infection in brown trout embryos (*Salmo trutta*). PLoS One 13(6): e0198834. doi:10.1371/journal.pone.0198834 (*shared first authorship) [OA] Cited 3 times.
- 8. Maitre, D., Selmoni, O., Uppal, A., Marques da Cunha, L., **Wilkins,** L. G. E., Roux, J., Mobley K. B., Castro, I., Knörr, S., Robinson-Rechavi, M., and Wedekind, C. 2017. Sex differentiation in grayling (Salmonidae) goes through an all-male stage and is delayed in genetic males who instead grow faster. **Scientific Reports** 7: 15024. doi:10.1038/s41598-017-14905-9 [OA] Cited 8 times.
- 7. Wilkins*, L. G. E., Marques da Cunha*, L., Menin, L., Ortiz, D., Voccat-Mottier, V., Hobil, M., Nusbaumer, D., and Wedekind, C. 2017. Maternal allocation of carotenoids increases stress tolerance in brown trout (*Salmo trutta*), Oecologia 185(3): 351-363. doi:10.1007/s00442-017-3952-y (*shared first authorship) Cited 9 times.
- 6. Wilkins, L. G. E., Marques da Cunha, Glauser, G., Vallat, A., and Wedekind, C. 2016. Environmental stress linked to consumption of maternally derived carotenoids in brown trout embryos (*Salmo trutta*). Ecology and Evolution 7(14): 5082-5093. doi:10.1002/ece3.3076 [OA] Cited 11 times.

5. Wilkins, L. G. E., Fumagalli, L., and Wedekind, C. 2016. Effects of host genetics and environment on egg-associated microbiota in brown trout (*Salmo trutta*). Molecular Ecology 25(19): 388-394. doi:10.1111/mec.13798 Cited 19 times.

- 4. **Wilkins**, L. G. E., Rogivue, A., Schütz F., Fumagalli, L., and Wedekind, C. 2015. Increased diversity of egg-associated bacteria on brown trout (*Salmo trutta*) at elevated temperatures. **Scientific Reports** 5: 17084. doi:10.1038/srep17084 [OA] Cited 20 times.
- 3. Wilkins, L. G. E., Clark, E. S., Farinelli, L., Wedekind, C., and Fumagalli, L. 2015. Embryonic gene expression of *Coregonus palaea* (whitefish) under pathogen stress as analyzed by high-throughput RNA-sequencing. Fish and Shellfish Immunology 47(1): 130-140. doi:10.1016/j.fsi.2015.08.035 Cited 4 times.
- 2. Wilkins, L. G. E., Rogivue, A., Fumagalli, L. and Wedekind, C. 2015. Declining diversity of egg-associated bacteria during development of naturally spawned whitefish embryos (*Coregonus* spp.). Aquatic Sciences 77(3): 481-497. doi:10.1007/s00027-015-0392-9 Cited 10 times.
- 1. Clark*, E. S., **Wilkins***, L. G. E. and Wedekind, C. 2013. MHC class I expression dependent on bacterial infection and parental factors in whitefish embryos (Salmonidae). **Molecular Ecology** 22(20): 5256-5269. doi:10.1111/mec.12457 (*shared first authorship) Cited 14 times.

Publications in preparation:

Clever, F., Sourisse, J. M., Preziosi, R. F., Eisen, J. A., Rodriguez Guerra, E.C., Scott, J. J., **Wilkins**, L. G. E., Altieri, A. H., McMillan, W. O., and Leray, M. The gut microbiome stability of a butterflyfish is disrupted in severely degraded Caribbean reef habitats. *Submitted to Nature Communications*

Leray*, M., Wilkins*, L. G. E., De León, M. E., Eizzat, L., Petersen, J., O'Dea, A., Yuen, B., Pereira, T. J., Bik, H. M., Duffy, J. E., Herre, E. A., Mejia, L. C., McMillan, W. O., Klein, D. I., Wcislo, W. T., and Eisen, J. A. Natural experiments in the sea as observatories of host-microbe ecology and evolution. (*shared first authorship) *Submitted to Nature Microbiology*

Osvatic*, J., Wilkins*, L. G. E., Leray, M., Camacho, Y., Gros, O., Eisen, J. A., Yuen, B., and Petersen, J. One symbiont to rule them all. (*shared first authorship) *In prep*

Krueger-Hadfield, S. A., Bashevkin, S., Sewell, M. A., Hare, M., Hahn, M., **Wilkins**, L. G. E., Lotterhos, K., Kindsvater, H., Albecker, M., and Reitzel, A. Genome-informed approaches and insight for characterizing targets of selection across complex life cycles in eukaryotes. *In prep*

Wilkins, L. G. E., Tomaschett, R., Kešnerová, L., Engel, P., Michel, M., Eisen, J. A., and Carlson, S. M. Trout embryos as an animal host-microbiome model to study non-genetic parental effects. *In prep*

Non-peer reviewed publications:

Wilkins, L. G. E. Utility of Microbiomes in Population Management. Symposium summary. Joint meeting of American Fisheries Society and Wildlife Society, Reno, December 23rd, 2019. **Fisheries Magazine** 40(12): 593-605. doi:10.1002/fsh.10373

Wilkins, L. G. E. (11/2014). Diversity of salmonid eggs and their bacterial symbionts: genetic and environmental effects. Ph.D. Thesis, 343p., University of Lausanne, Faculty of Biology and Medicine, Wedekind, C. and Fumagalli L. (dir)

JOURNAL REVIEWING -

for BMC Research Notes, Conservation Genetics, Evolution, Frontiers in Marine Science, Frontiers in Ecology and Evolution, Genes, Hydrobiologia, International Journal of Molecular Sciences, Molecular Ecology, Journal of Fish Diseases, Microbial Ecology, PLoS Biology, and Scientific Reports.

TEACHING AND SUPERVISION

During summer 2018, I completed the online summer course in teaching Bachelor students (undergraduates) *Scientists Teaching Science* at the New York Academy of Sciences. Emphasis on active learning; bias, discrimination and diversity; and teaching online courses (MOOCs).

In spring 2019, I participated in a seminar with Dr. Susan L. Keen at UC Davis at the College of Biological Sciences on how to develop a large (n > 500) *Introductory Biology Class* (EVE 298 CRN 73701).

Courses I taught:

- ♦ Zoology for 1st year BSc students (Teaching Assistant 'TA'; University of Lausanne, 2010-2014)
- ♦ Applied Microbiology for 1st year BSc students (TA; University of Lausanne, 2014)
- ◆ Computational Population Genetics for 2nd year BSc students (co-organizer; University of Lausanne, 2010-2014)
- ♦ Conservation Biology for 3rd year BSc students (TA; University of Lausanne, 2014)
- ♦ *Molecular Population Genetics* for graduate students (co-organizer; University of Lausanne, 2013 and 2014)
- Guest lecturer in *Freshwater Ecology* for senior BSc students at UC Berkeley (2018), Title: '*Freshwater Microbiomes*'
- Marine Microbial Ecology Seminar for graduate students at UC Davis (winter 2019)

Guest lectures for children: Introduction to Evolutionary Biology at elementary school (Ocean View, Albany CA, USA, spring 2018); Guest lectures at high school level: Introduction to Evolutionary Biology and Genetics in the Ocean at Gymnasium Kloster Disentis, Switzerland, 2011-2016; and Freshwater Biology at Campolindo Highschool, Moraga, CA, USA, spring 2018

Mentoring:

Graduate students

- ♦ *Isidora Morel* MPIMM Bremen, Germany (since fall 2020, ongoing)
- ♦ Bryan Van Orman CSU Monterey Bay, CA, USA (since fall 2019, ongoing)
- ♦ *Victor Ammann* University of Lausanne Switzerland (fall 2018)
- ♦ *David Zeugin* University of Lausanne Switzerland (spring 2016)
- ♦ *Oliver Selmoni* University of Lausanne Switzerland (2015/16 academic year)
- ♦ *Véronique Voccat-Mottier* University of Lausanne Switzerland (spring 2015)
- ♦ Chloë Schmidt and Hanna Smith University of Lausanne Switzerland (spring 2014)
- ♦ **Zoé Daeppen** University of Lausanne Switzerland (2013/14 academic year)
- ♦ *Dr. Aude Rogivue* University of Lausanne Switzerland (2012/13 academic year)

Undergraduate students

- ♦ *Jummai Bello* Federal University of Technology, Akure, Ondo State, Nigeria (since spring 2019, ongoing through the Society for Women in Marine Sciences <u>SWMS</u>)
- ♦ Kevin Cai University of California, Davis (since fall 2019, ongoing)
- ♦ *Ipek Yasmin Meric* University of California, Davis (spring 2019)
- Helio Quintero Arrieta University of Panamá, Panamá (since fall 2018, ongoing)
- ♦ Kaylah Marcello, Jolie Lobrutto and Amy Wen University of California, Davis (summer 2018)
- ♦ Roger Faust University of California, Santa Cruz (summer 2018; Doris Duke Conservation Scholar)
- ♦ Emma Pereira University of Lausanne Switzerland (2015/16 academic year)

PRESENTATIONS -

2019 Comparative genomic analysis of metagenome-assembled genomes from feces of antibiotic treated koalas after Chlamydia infection and Coevolution and diversification of microbial symbionts in marine animal hosts (two talks) Joint Meeting of the American Wildlife Society and the American Fisheries Society (AFS) in Reno, Nevada, USA

- 2019 Evolution and diversification of symbiosis during a natural experiment in the sea (poster) Gordon Research Conference on Animal-Microbe Symbioses #GRCAnimalSymbioses, Mount Snow, VT, USA
- 2018 Non-genetic paternal effects on early salmonid development (poster) Lake Arrowhead Microbial Genomics Conference #LAMG2018, UCLA, USA
- 2018 Non-genetic paternal effects on early salmonid development (talk) UC Davis Postdoc Symposium, USA
- Who lives in the guts of O. mykiss juveniles harboring different migratory genotypes (poster and talk) Coastal Marine Science Symposium UC Davis, USA
- 2017 Berkeley Spouses, Partners and Parents Association BSPPA (poster) Postdoc appreciation week UC Berkeley, USA
- 2017 Bacteria everywhere: on fish, inside fish, and in hot springs of Kamchatka (talk) WSL Birmensdorf, Switzerland
- 2017 Non-genetic paternal effects on early salmonid development (talk) AFS National Meeting, Tampa FL, USA
- 2017 Maternal allocation of carotenoids increases tolerance to bacterial infection in brown trout (talk) AFS Cal-Neva, Eureka CA, USA
- 2015 Embryo genetics affects composition of host-associated bacteria in brown trout (poster) ESEB, Lausanne, Switzerland
- 2014 Microbial communities on salmonid eggs (talk) Population Genomics Symposium, University of Lausanne, Switzerland
- 2013 Ergebnisse Äschenuntersuchungen im Engadin (talk) Weiterbildungskurs Fischereiaufseher Pontresina, Switzerland
- 2013 Immune gene expression in whitefish embryos (poster and talk) Evolution, Snowbird UT, USA
- 2011 Microbial communities on salmonid eggs (talk) Metagenomics Symposium, University of Neuchâtel, Switzerland
- 2010 Inbreeding at the MHC in humpback whales (poster) Biennial Conference on the Biology of Marine Mammals, Québec City, Canada

Invited talks:

- 2020 Trout embryos as an animal host-microbiome model to study non-genetic parental effects, Flying Couch Seminar (virtual only) at San Diego State University, CA, USA; organized by Prof. Scott Kelley
- 2020 20 Questions in Evolutionary Biology, Natural Sciences Seminar Series, CSU Monterey Bay, CA, USA
- 2019 Coevolution and diversification of microbial symbionts in marine animal hosts, Marine Biological Laboratories (MBL), Woods Hole, MA, USA
- 2019 Coevolution and diversification of microbial symbionts in marine animal hosts, Max Planck Institute for Marine Microbiology, Bremen, Germany
- 2018 Microbial symbionts from Swiss alpine rivers to Oceans in Central America, University of Vienna, Austria
- 2018 Berkeley Spouses, Partners and Parents Association BSPPA (keynote) National Postdoc Association Annual Meeting, Cleveland OH, USA
- 2017 Non-genetic paternal effects on early salmonid development U.S. Fish and Wildlife Service, Red Bluff Fish and Wildlife Office, CA, USA
- 2017 Diversity of bacterial symbionts on salmonid eggs genetic and environmental effects Microbiology Seminar UC Davis, USA
- 2017 Salmonid embryos: a powerful system to study evolutionarily relevant questions in ecology NOAA Southwest Fisheries, Santa Cruz CA, USA
- 2016 16 Questions in Evolutionary Biology WSL Birmensdorf, Switzerland
- 2010 MHC and female mating preferences in humpback whales ETH Zürich, Switzerland
- 2010 MHC and female mating preferences in humpback whales IFM Geomar Kiel, Germany
- 2010 MHC and female mating preferences in humpback whales AWI Wattenmeerstation Sylt, Germany

PROFESSIONAL SOCIETIES MEMBERSHIPS

- Society for the Study of Evolution SSE: http://www.evolutionsociety.org/
- European Society for Evolutionary Biology ESEB: https://eseb.org/
- Society for Women in Marine Sciences SWMS: http://swmsmarinescience.com/
- Beneficial Microorganisms for Marine Organisms, BMMO network: https://bmmo.microbe.net/
- Mangrove Microbiome Initiative: https://msystems.asm.org/content/5/5/e00658-20
- Research Coordinated Network for Evolution in Changing Seas (RCN-ECS): https://rcn-ecs.github.io/

LANGUAGES -

- Swiss German (mother tongue)
- German (excellent)
- English (excellent)
- French (fluent in conversation and writing)
- Swedish (fluent in conversation and writing)
- Rhaeto-Romanic (conversational)
- Spanish (A2 level, currently taking classes)
- R, Perl, Python

INTERESTS –

My research interests include host-microbe interactions (*e.g.*, chemosymbioses), their evolution, and their role in ecosystem function and stability.

I care about diversity, creativity and an **inclusive environment** in academia. I strongly support **reproducible and open research** (sharing of raw data, protocols, bioinformatic pipelines via GitHub: https://github.com/megaptera-helvetiae, Jupyter Notebooks, protocols.io, and Figshare). I am also following the principles of the *Riffomonas Reproducible Research Tutorial* by Patrick Schloss (http://www.riffomonas.org/reproducible_research/).

October 21st, 2020