

Alexis Simon

PHD · EVOLUTIONARY BIOLOGY

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Education

PhD: evolutionary and biodiversity sciences, defended 12/12/2019

[Montpellier, France](#)

UNIVERSITY OF MONTPELLIER, INSTITUT DES SCIENCES DE L'ÉVOLUTION - MONTPELLIER (ISEM)

Sept. 2016 – Dec. 2019

Dissertation: Genomics of anthropogenic hybridization in *Mytilus spp.* mussels and hybrid fitness.

Master's degree: ecology, biodiversity & evolution (EBE)

[Paris, France](#)

ÉCOLE NORMALE SUPÉRIEURE (ENS), UNIVERSITY PARIS VI

2013 – 2016

The *École Normale Supérieure* is a prestigious institution of higher education providing specialized training to students who will become researchers and professors in their field.

Bachelor's degree: life sciences

[Paris, France](#)

ÉCOLE NORMALE SUPÉRIEURE (ENS)

2010 – 2013

Classe préparatoire

[Caen, France](#)

SUBJECTS: BIOLOGY, MATHEMATICS, CHEMISTRY, PHYSICS, GEOLOGY

2010 – 2012

A two-year intensive course preparing for highly competitive, national entrance examinations to French *Grandes Écoles* (including the ENS, veterinary schools and engineering schools). Admitted to the ENS.

Research experiences

Post-doctoral researcher with Graham Coop

[Davis, CA, USA](#)

UNIVERSITY OF CALIFORNIA DAVIS

Jul. 2021 – present

Estimating the contribution of admixture, selection, and genetic drift to allele frequency change in time series genomic data. Method development, simulation and use of human ancient DNA datasets for analyses.

Post-doctoral researcher with Nicolas Bierne

[Montpellier, France](#)

INSTITUT DES SCIENCES DE L'ÉVOLUTION - MONTPELLIER (ISEM)

Feb. 2020 – May 2021

Molecular evolution of the *Mytilus* transmissible cancer

- Genome assembly for three species using long-reads technology
- Analyses of genomes of transmissible cancers: variants, mutation spectra, ploidy

Graduate student with Nicolas Bierne and John Welch (Cambridge)

[Montpellier, France](#)

INSTITUT DES SCIENCES DE L'ÉVOLUTION - MONTPELLIER (ISEM)

Sept. 2016 – Dec. 2019

Genomics of anthropogenic hybridization in *Mytilus spp.* mussels and hybrid fitness

- Field sampling, DNA extraction and preparation
- Population genetics and genomics: hybrid zones and admixture
- Five cumulative months spent in the genetics department of the university of Cambridge with John Welch: Use of Fisher's geometric model to obtain analytical results for the fitness of hybrids

Master's internship with Nicolas Bierne

[Montpellier, France](#)

INSTITUT DES SCIENCES DE L'ÉVOLUTION - MONTPELLIER (ISEM)

Feb. – July 2016

Biological invasion with hybridization in the *Mytilus edulis* species complex: genetic data analysis and modeling.

Gap year internship with David Claessen and Boris Sauterey

[Paris, France](#)

BIOLOGICAL INSTITUTE OF THE ENS, ECO-EVOLUTIONARY MATHEMATICS TEAM

Feb. – July 2015

Implementation of a trait diffusion model of phytoplankton-zooplankton co-evolution in a 1D version of the MIT general circulation model.

Gap year internship with Claudia Junge and Bronwyn Gillanders

[Adelaide, Australia](#)

MARINE ECOLOGY LABORATORY, ADELAIDE UNIVERSITY

Sept. 2014 – Jan. 2015

Population genetics of two shark species, *Carcharhinus obscurus* and *Carcharhinus brachyurus*.

Master's intership with Ingrid Richter and Andrew Fidler

[Nelson, New-Zealand](#)

CAWTHRON INSTITUTE

Feb. – July 2014

Detecting environmental petroleum pollutants and associated chemicals using tunicate xenobiotic receptors as sensor elements in modified yeast strains.

Bachelor's internship with Pierrick Barbier and Tarik Meziane

Paris, France

FRENCH NATIONAL MUSEUM OF NATURAL HISTORY (MNHN)

June – July 2013

Recruitment variability of *Bivalvia* in the *Glycymeris glycymeris* habitat in the archipelago of Chausey (France).

Grants

Junior research team, Labex CEMEB: 5000€

- 2018 Local funding for a PhD student to form a junior research team with a graduate student to expand a new topic of the PhD. [Montpellier, France](#)

Teaching and mentoring

- 2020 **Co-supervision of a 2nd year Master's student (1 semester)**, evolutionary history and introgression heterogeneity in a speciation continuum of partially isolated mussels *Mytilus spp.* [Univ Montpellier](#)
- 2018 **Co-supervision of a 2nd year Master's student (1 semester)**, evolutionary genetics and genomics of a transmissible cancer in the *Mytilus edulis* species complex. [Univ Montpellier](#)
- 2018 **Teaching fellow (1 semester)**, tutorials for data analysis in ecology - statistics, HLMA408 [Univ Montpellier](#)

Invited talks

- Center for Population Biology seminar, UC Davis** February 2022
- Molly Schumer's lab seminar (Stanford University, USA)** November 2020
- EvoLunch, IST seminar (Vienna, Austria)** June 2020

Conference talks and posters

- GSA Population, Evolutionary, and Quantitative Genetics Conference (poster)** 2022
- Population Genetics Group Meeting, PopGroup (talk)** 2021
- Evolution, II Joint Congress on Evolutionary Biology (talk)** 2018
- Evolution, II Joint Congress on Evolutionary Biology (poster)** 2018
- Marine Evolution (talk)** 2018
- Sfécologie - International Conference on Ecological Sciences (talk)** 2018
- GDRi on Marine connectivity, MarCo (talks)** 2016, 2017, 2018
- French meeting of the GDR on biological invasions (talk)** 2018
- SMBE regional meeting, Interdisciplinary Approaches for Molecular Evolution (talk)** 2017
- Petit pois déridé, French meeting of population geneticists (talk)** 2017
- French GDR interdisciplinary approaches in evolution (poster)** 2017
- Advances in Marine Mussel Research (talks)** 2016, 2017
- European Elasmobranch Association Conference (talk)** 2015

Skills

- Programming** R, Python, LaTeX, Snakemake
- Bioinformatics** Variant calling, genome assembly, demographic inference, pipeline development
- Languages** French (native), English (proficient)
- Diving** SCUBA CMAS level 3, indoor freediver CMAS level 1, FFESSM rescue diver (RIFAP)

Publication list

PUBLISHED

- Prevalence and Polymorphism of a Mussel Transmissible Cancer in Europe
Hammel, M., **A. Simon**, C. Arbiol, A. Villalba, E. A. V. Burioli, J.-F. Pépin, J.-B. Lamy, A. Benabdelmouna, I. Bernard, M. Houssin, G. M. Charrière, D. Destoumieux-Garzon, J. J. Welch, M. J. Metzger, and N. Bierne
Molecular Ecology 31.3 pp. 736–751. 2022.
- Urban Rendezvous along the Seashore: Ports as Darwinian Field Labs for Studying Marine Evolution in the Anthropocene
Touchard*, F., **A. Simon***, N. Bierne, and F. Viard
Evolutionary Applications. 2022. *co-first authors.

DILS : Demographic Inferences with Linked Selection by Using ABC

Fraisse, C., I. Popovic, J. Romiguier, E. Loire, **A. Simon**, N. Galtier, L. Duret, N. Bierne, X. Vekemans, and C. Roux
Molecular Ecology Resources. 2021.

Agent-Based Modeling and Genetics Reveal the Limfjorden, Denmark, as a Well-Connected System for Mussel Larvae

Pastor, A., J. Larsen, F. T. Hansen, **A. Simon**, N. Bierne, and M. Maar
Marine Ecology Progress Series. 2021.

How Do Species Barriers Decay? Concordance and Local Introgression in Mosaic Hybrid Zones of Mussels

Simon, A., C. Fraisse, T. El Ayari, C. Liautard-Haag, P. Strelkov, J. J. Welch, and N. Bierne
J Evol Biol 34 pp. 208–223. 2021.

Replicated Anthropogenic Hybridisations Reveal Parallel Patterns of Admixture in Marine Mussels

Simon, A., C. Arbiol, E. E. Nielsen, J. Couteau, R. Sussarellu, T. Burgeot, I. Bernard, J. W. P. Coolen, J.-B. Lamy, S. Robert, M. Skazina, P. Strelkov, H. Queiroga, I. Cancio, J. J. Welch, F. Viard, and N. Bierne
Evolutionary Applications 13.3 pp. 575–599. 2020.

Implementation of Various Approaches to Study the Prevalence, Incidence and Progression of Disseminated Neoplasia in Mussel Stocks

Burioli, E., S. Trancart, **A. Simon**, I. Bernard, M. Charles, E. Oden, N. Bierne, and M. Houssin
Journal of Invertebrate Pathology 168 p. 107271. 2019.

Comparative Population Genomics Confirms Little Population Structure in Two Commercially Targeted Carcharhinid Sharks

Junge, C., S. C. Donnellan, C. Huvneers, C. J. A. Bradshaw, **A. Simon**, M. Drew, C. Duffy, G. Johnson, G. Cliff, M. Braccini, S. C. Cutmore, P. Butcher, R. McAuley, V. Peddemors, P. Rogers, and B. M. Gillanders
Marine Biology 166.2. 2019.

A Single Clonal Lineage of Transmissible Cancer Identified in Two Marine Mussel Species in South America and Europe

Yonemitsu, M. A., R. M. Giersch, M. Polo-Prieto, M. Hammel, **A. Simon**, F. Cremonte, F. T. Avilés, N. Merino-Véliz, E. A. V. Burioli, A. F. Muttaray, J. Sherry, C. Reinisch, S. A. Baldwin, S. P. Goff, M. Houssin, G. Arriagada, N. Vásquez, N. Bierne, and M. J. Metzger
eLife 8 e47788. 2019.

Coadapted Genomes and Selection on Hybrids: Fisher's Geometric Model Explains a Variety of Empirical Patterns

Simon, A., N. Bierne, and J. J. Welch
Evolution Letters 2.5 pp. 472–498. 2018.

Digest: Demographic Inferences Accounting for Selection at Linked Sites

Simon, A. and M. Duranton
Evolution. 2018.

Weird Genotypes? Don't Discard Them, Transmissible Cancer Could Be an Explanation

Riquet, F., **A. Simon**, and N. Bierne
Evolutionary Applications 10 pp. 140–145. 2017.

PREPRINTS

Three New Genome Assemblies of Blue Mussel Lineages: North and South European *Mytilus Edulis* and Mediterranean *Mytilus Galloprovincialis*

Simon, A.
bioRxiv. 2022.