

Guillaume LOUVEL

Professional experiences

2021/01–2023/04

Postdoctoral researcher, *Diversity, Ecology and Evolution of Microbes*, Université Paris-Saclay, France.
Deep phylogenetics: causes of incongruence in gene trees of Asgard archaea and Eukaryotes. Direction: Dr. Laura EME.

Education

2016/09–2020/09

PhD, *Dyogen team, Institut de Biologie de l'École Normale Supérieure*, Paris, France.
Dating within gene trees: speciations, duplications, losses. Direction: Prof. Hugues ROEST CROLLIUS.

2018/05

EMBO Course: Computational Molecular Evolution (CoME), *Hellenic Center for Marine Research*, Heraklion, Greece, 61h.

2017/12

Population genetics course: Genomes, Populations, Species, *École Normale Supérieure*, Paris, 30h.
Coordination: Prof. Guillaume Achaz

2015–2016

Master's degree 2^d year: Molecular and Cellular Biology (BMC), specialisation Bioinformatics and Modelling (BIM), *Pierre and Marie Curie University (UPMC)*, Paris, with high honours (Mention Bien).

2014–2015

Internships for the ENS Diploma (cf. internships), *École normale supérieure (ENS) of Paris*.

2013–2014

Master's degree 1st year: Ecology, Biodiversity, Evolution (EBE), *École normale supérieure (ENS), Pierre and Marie Curie University (UPMC)*, Paris.

2012–2013

Bachelor's degree in Life Science, *ENS, UPMC*, Paris, with honours.

2010–2012

Classes Préparatoires aux Grandes Écoles BCPST (Biology, Chemistry, Physics and Earth Sciences), *Sainte-Geneviève high school*, Versailles, France.

2010

Baccalauréat, scientifique serie, *Nantes local education authority–Lycée Nicolas Appert*, Orvault, France, with highest honours.

Teaching

2018–2019

32h, ENS.
Biostatistics lectures, Evolutionary genomics, Bioinformatics assistant in practicals (Bachelor, Master)

2017–2018

32h, ENS.
Assistant in bioinformatics and phylogenetics practicals (Bachelor, Master)

2017, 2018, 2019

3×3h, volunteer via the student association of IBENS.
Introduction to the phylogenetic comparative methods

2013

Biology oral examiner in CPGE, *Sainte-Geneviève high school*, Versailles, France.

Undergraduate internships

- February–June 2016 **Master 2 internship**, *Dyogen team, Institut de biologie de l'École normale supérieure (IBENS), Paris, France.*
Retained functions of gene duplicates in vertebrates. Supervision: Prof. Hugues ROEST CROLLIUS
- March–July 2015 **Own-initiative internship**, *Paleomix group, Centre for GeoGenetics, Natural History Museum of Denmark.*
A pipeline for ancient metagenomics. Supervision: Assoc. Prof. Ludovic ORLANDO
- Sept. 2014–Jan. 2015 **Own-initiative internship**, *South African Iziko's Museum, Cape Town, South Africa.*
Palaeontology of the South-African Karoo: Juvenile aggregations of Permian reptiles.
Supervision: Prof. Roger SMITH
- February–June 2014 **Master 1 internship**, *Paleomix group, Centre for GeoGenetics, Natural History Museum of Denmark.*
Deciphering ancient epigenomes. Supervision: Assoc. Prof. Ludovic ORLANDO
- June–July 2013 **Bachelor internship**, *Biology of Genomes, UMR 7238 CNRS, UPMC, Paris.*
Establishment of the substitution patterns and rates on several chromosomal loci of the yeast *Lachancea kluyveri*. Supervision: Prof. Gilles FISCHER

Other professional experience

- 2009 **BAFA diploma**, France & Germany, Youth leadership certificate in holiday camp.

Languages

English	fluent
French	native
German	good

Computer skills

Work environnements

- GNU Linux, Mac OS X
- UNIX command line
- code versioning: Git
- High Performance Computing: Slurm, HTCondor

Programming languages

- Python, expert
- Bash, expert
- R, proficient
- Perl, familiar
- Vimscript, familiar
- C++, learning

Bioinformatics

- workflow managers (snakemake, GNU make)
- NGS, alignments, phylogenetics

Data analysis

- Python packages: Numpy, Scipy, Pandas, Statsmodels, Scikit-learn
- Statistical modelling: PCA, multiple linear regression, Lasso regression, mixed models, bayesian statistics

Software projects

Multipurpose tools for phylogenetics:
Metagenomics pipeline for ancient DNA:
Reconciliation algorithm (gene tree - species tree):
Contributions:

github.com/DyogenIBENS/Phylorgs
bitbucket.org/Glouvel/metabit
github.com/Gullumluv1/Genarium
APE (R), simclock (R), Ete3 (Python)

Publications

PhD publications

- Louvel, G.** and Roest Crolius, H. Aug. 14, 2023. “Factors influencing the accuracy and precision in dating single gene trees”. In: *bioRxiv*: 10.1101/2020.08.24.264671v2. DOI: 10.1101/2020.08.24.264671. *submitted*.
- Szenker-Ravi, E., Ott, T., Khatoor, M., Moreau de Bellaing, A., Goh, W. S., Chong, Y. L., Beckers, A., Kannesan, D., and **Louvel, G.**, et al. 2022. “Discovery of a genetic module essential for assigning left–right asymmetry in humans and ancestral vertebrates”. In: *Nature Genetics* 54.1, pp. 62–72. DOI: 10.1038/s41588-021-00970-4.

Previous publications

- Louvel, G.**, Der Sarkissian, C., Hanghøj, K., and Orlando, L. May 2016. “metaBIT, an integrative and automated metagenomic pipeline for analyzing microbial profiles from high-throughput sequencing shotgun data”. In: *Mol. Ecol. Resour.* DOI: 10.1111/1755-0998.12546.
- Gillet-Markowska, A., **Louvel, G.**, and Fischer, G. Nov. 2015. “bz-rates: A Web Tool to Estimate Mutation Rates from Fluctuation Analysis.” In: *G3 (Bethesda)*. 5.11, pp. 2323–7. DOI: 10.1534/g3.115.019836.
- Seguin-Orlando, A., Gamba, C., Der Sarkissian, C., Ermini, L., **Louvel, G.**, Boulygina, E., Sokolov, A., Nedoluzhko, A., and Lorenzen, E. D., et al. Jan. 2015. “Pros and cons of methylation-based enrichment methods for ancient DNA.” In: *Sci. Rep.* 5, p. 11826. DOI: 10.1038/srep11826.

Scientific communications

- 2023/01 **ALPHY (Alignments and Phylogeny)**, *Grenoble*.
Causes for discord in eukaryotic protein domains inherited from Archaea
- 2023/01 **ISEP Virtual Meeting (International Society for Evolutionary Protistology)**, *Online*.
- 2017/02 **ALPHY (Alignments and Phylogeny)**, *Paris*, MNHN.
Genomic markers of species diversification in Vertebrates

Personal interests

Community involvement

- Member of the organising comity of the YRLS conference, 2017 (Young Researchers in Life Sciences), Paris.
- Vice-treasurer of the association Phoenix de Montrouge, 2017–2019 (ultimate frisbee)

Sciences

- Evolution;
- fauna and flora ;
- paleontology, history of Earth and life;
- ...

Other

- running, ultimate frisbee, hiking, climbing;
- Bicycle repair;
- Science-fiction, fantasy;
- Psychedelic rock.