

Professional experience

- September 2020 – now **PhD student**, *Université de Paris, IAME research center*, Paris
PhD in population genetics: *Genome-wide Epistasis in Escherichia coli and the spread of antibiotic-resistant clones*, under the supervision of Pr. Olivier Tenaillon. Use of Python, R, SQL.
- February 2020 **Research intern**, *IAME research center*, Paris
June 2020 Mutation effect inference and population genetics of *Escherichia coli* using 60,000 genomes, under the supervision of Pr. Olivier Tenaillon. Statistical physics applied to DNA analysis. Use of Python.
- April 2018 **Research intern**, *University of Sussex*, Falmer
August 2018 Studied comparative population genetics of *Neisseria meningitidis* and *Neisseria gonorrhoeae*, under the supervision of Pr. Adam Eyre-Walker. Use of Python and R.
- June 2019 **Industry intern**, *Merck Serono S. A.*, Aubonne - Suisse
August 2019 Performance of alternative **Bayesian estimation algorithms** in **Pharmacokinetics/Pharmacodynamic non-linear mixed effect models**. Optimal design of clinical trials. Use of R, Stan, PopED, NONMEM.
- June 2017 **Industry intern**, *Thales Alenia Space*, Cannes
August 2017 Worked on a computer science project in **data visualisation**, followed a project of **digitalisation of Thales Group** in the frame of the Thales Digital Factory. Use of Angular, TypeScript, D3.js.
- October 2015 **Teacher**, *Detention Center*, Villefranche-sur-Saône
April 2016 Provided courses to the prison population.

Education

- 2018–2020 **EPFL**, Lausanne
12th university in the world (QS – World University Ranking). *Life Sciences and Technology* Master. Received an **excellence fellowship** of CHF 16,000 per academic year. **Best average grade award**.
- 2015–2018 **École polytechnique**, Paris
One of France's **top engineering schools**. Key subjects studied: **Physics, Biology & Computer Science**
- 2013–2015 **Classe Préparatoire aux Grandes Écoles (PCSI-PC*)**, *Lycée Fermat*, Toulouse
Intensive 2-year university level preparation in **Maths, Physics and Chemistry** for the highly competitive entrance exams to the Master's level engineering French schools

Publications

- 2022 Vigué L., Croce G., Petitjean M., Ruppé E., Tenaillon O., Weigt M. Deciphering polymorphism in 61,157 *Escherichia coli* genomes via epistatic sequence landscapes. *Nature Communications*
- 2022 Hobson, C. A., Vigué, L., ... & Tenaillon, O. MiniBioReactor Array (MBRA) *in vitro* gut model: a reliable system to study microbiota-dependent response to antibiotic treatment. *JAC-Antimicrobial Resistance*
- 2022 Hobson, C. A., Vigué, L., ... & Birgy, A. A Microbiota-Dependent Response to Anticancer Treatment in an *In Vitro* Human Microbiota Model: A Pilot Study With Hydroxycarbamide and Daunorubicin. *Frontiers in Cellular and Infection Microbiology*
- 2019 Vigué L., Eyre-Walker A. The comparative population genetics of *Neisseria meningitidis* and *Neisseria gonorrhoeae*. *PeerJ*

Projects

- E. coli* database Built, organized and analysed a SQL database of 61,157 genomes of *Escherichia coli*: clustering and annotating genes, inferring phylogenies, ancestral sequences and mutation effects.
- DNA barcodes analysis Analysis of evolution experiments: clustering of DNA barcodes to detect and correct sequencing errors, bayesian approach to infer establishment times and fitness of *de novo* mutations.
- Microbiota analysis Developed a pipeline to analyse and visualize data from gut *in vitro* experiments using Qiime2 and Python. Pipeline currently used in two labs for day-to-day activities.

Languages

- French Native speaker
English Fluent (TOEIC Listening and reading: score of 960 over 990)