Lucas Ducrot

researchgate.net/profile/Lucas-Ducrot - linkedin.com/in/lucas-ducrot-7b85a9123/
https://perso.lpsm.paris/ lducrot/

EDUCATION

Sorbonne Université — **Paris, France**
PhD candidate in Applied Mathematics at LPSM — *January 2021 - Current*

Imperial College London — **London, UK**
MSc in Bioinformatics and Theoretical Systems Biology — *October 2017 - September 2018*

Ecole Centrale de Nantes — **Nantes, France**
Diplôme d'ingénieur in Applied Mathematics and Computer Science — *September 2013 - September 2017*

Lycée Blaise Pascal — **Clermont-Ferrand, France**
CPGE (Preparatory Classes) - MPSI/MP (Mathematics and Physics) — *September 2010 - August 2013*

WORK EXPERIENCE

PhD Candidate in Applied Mathematics
LPSM - Sorbonne Université, Paris, France — *January 2021 - Current*

- Bayesian networks and survival analysis for penetrance estimation of lung cancer linked to genetic predisposition. Supervised by Grégory Nuel (Sorbonne Université - LPSM) and Patrick Benusiglio (Sorbonne Université - APHP).

Research Engineer in Bioinformatics
Human Genetics Institut, Montpellier, France — *June 2019 - December 2020*

- Bioinformatician (especially ChIP-seq and RNA-seq post sequencing analysis) for the Biology of Repeated Sequences' team, Department of Genome Dynamics. Team leader: Jérôme Dejardin.

INTERNSHIPS

Research Intern
Imperial College London, UK — *January 2018 - September 2018*

- Master Thesis in the department of Bioengineering (Faculty of Engineering) : LSTM neural network for data set augmentation of eczema severity time series. Supervised by Reiko Tanaka.
- Internship in the Section of Paediatrics (Faculty of Medicine) : determining the role of genetic determinants of white blood cells in susceptibility and severity of childhood meningococcal disease. Supervised by Clive Hoggart.
- Internship in the Theoretical Systems Biology Group (Centre for Bioinformatics) : implementation of tools in Julia for the computation and graphical representation of Waddington epigenetic landscapes. Supervised by Michael Stumpf.

Research Intern
University College Dublin, Ireland — *April 2017 - September 2017*

- Master Thesis in the Performance Engineering Lab (LERO - School of Computer Science) : genetic algorithms for test suite generation in a multi-objective context using the software (in Java) Evosuite. Supervised by Anthony Ventresque.

Research Intern (Gap year)
Cornell University, USA — *September 2015 - June 2016*

- Internship in the Evolutionary Biology and Population Genomics team, Department of Biological Statistics and Computational Biology (College of Agriculture and Life Sciences) : numerical simulations (in C++) of the evolution of resistance against CRISPR/cas9-mediated gene drive. Supervised by Philipp Messer.
- Internship in the Section of Epidemiology, Department of Population Medicine and Diagnostic Sciences (College of Veterinary Medicine) : mathematical modelling of E. coli metapopulation, evolution of antimicrobial resistance in a steer cattle with ceftiofur or chlortetracycline treatments. Supervised by Yrjö Gröhn.

Research Intern
CEA, Saclay, France — *April 2015 - August 2015*

- Internship in the Department of Particle Accelerators, Cryogenics and Magnetism, tomography-reconstruction of a set of particles in dimension n>1 from the knowledge of their position on certain privileged axes (using the principle of maximum entropy), coded in C++. Supervised by Phu Anh Phi Nghiem.

Intern
Société Générale, Vichy, France — *September 2014 - August 2014*

- Assistant of a Private Bank advisor - Marine Bois.

PUBLICATIONS & COMMUNICATIONS

Publications:

- Barral A, Pozo G, Ducrot L, Papadopoulos GL, Sauzet S, Oldfield AJ, Cavalli G, Déjardin J. *SETDB1/NSD-dependent H3K9me3/H3K36me3 dual heterochromatin maintains gene expression profiles by bookmarking poised enhancers*. Mol Cell. Feb 2022. 10.1016/j.molcel.2021.12.037 Link
- Cazer LC, Ducrot L, Volkova VV, Grohn Y. *Monte Carlo simulations suggest current chlortetracycline drug-residue based withdrawal periods would not control antimicrobial resistance dissemination from feedlot to slaughterhouse*. Frontiers in Microbiology. Sept 2017. 10.3389/fmicb.2017.01753 Link

Preprints:

- Ducrot L, Nuel G. *Estimation of penetrance in age-dependent genetic disease with sporadic cases from pedigree data*. Feb 2023. Link
- Ducrot L, Nathan N, Nuel G & Legendre M. *Penetrance of interstitial lung disease and lung cancer in SFTPA1 or SFTPA2 variants carriers*. Feb 2023. Link

Posters & Conference papers:

- Ducrot L, Nuel G. *Estimation of penetrance in age-dependent genetic disease with sporadic cases from pedigree data*. European Mathematical Genetics Meeting 2023. Link
- Benusiglio PR, Ducrot L, Hasnaoui J, Coulet F, Desseignés C, Canlorbe G, Gueye D, Uzan C, Guillerm E, Nuel G. *The Manchester Scoring System in 2022: performances before and after raking in breast and ovarian cancer patients undergoing multigene panel testing*. ESHG annual meeting 2022. Link
- Nghiem PAP, Chauvin N, Ducrot L, Simeoni Jr W, Valette M, Uriot D. *Characterization of high intensity beam in Linacs*. 61st ICFA Advanced Beam Dynamics Workshop 2018. Link
- Nghiem PAP, Chauvin N, Ducrot L, Dumas J, Uriot D, Valette M. *Design of high intensity, high powers Linacs*. 13th International Topical Meeting on Nuclear Applications of Accelerators 2017. Link
- Nghiem PAP, Ducrot L, Chauvin N, Valette M. *Using of the MENT method for reconstruction of 2D particle distributions in IFMIF accelerators*. International Particle Accelerator Conference 2016. Link

Talks:

- February 2024, MIA seminar, AgroParisTech, Saclay
- October 2023, Young Probabilists and Statisticians, Oléron island
- July 2023, Days of Statistics, Brussels
- March 2023, PhD students seminar (LPSM), Paris
- June 2021, ISCD workshop, Paris

TECHNICAL SKILLS & LANGUAGES

Languages: French (Native), English (Fluent, TOEIC 960, TOEFL iBT 92)

Programming Languages: R, Python, C++, Java, Matlab, Julia.

Tools: Git, Latex, CUDA, ModelMaker, Vensim.

Environments: Linux/MS Windows - clusters.

Bioinformatics: Plink, Samtools, Deeptools, Chipseeker, Diffbind, FastQC, Cufflinks, Bowtie2, MACS2, MEME suite, BedTools, IGV, STAR, EdgeR, Deseq2.

TEACHING & ACADEMIC ACTIVITIES

Teaching: Total amount 152h

- Mathematics for science (1st year, Sorbonne Université, Linear Algebra and Probability): 3*38h
- Data Science (1st year, Sorbonne Université, Statistics and Python): 1*38h

Academic Activities:

- Co-organizer of PhD students seminar (GTT) at LPSM in 2021-2022
- Supervision of a 3rd year internship - Léo Dupuis

EXTRACURRICULAR ACTIVITIES

- Practice of Handball since 2001 as player, coach and referee
- Practice of Rugby (Fifteen and seven) 2014-2016 as player
- Practice of Climbing since 2018
- Practice of Guitar between 2005 and 2010, now occasionally
- Tutor in BRIO, an association that provides tutorship for young people (16-18 years old) from disadvantaged backgrounds (2013-2014).
- Logistic person in charge for the organization of a sports weekend (2013-2014).