Orianne Debeaupuis

Pharm.D., Ph.D., Eng. (École Polytechnique, X19)
Onco-haematology

Google Scholar

Clinician-scientist in haematology bridging clinical medicine, translational research, and analytical modeling.

Academic appointments and employment

2025–Present **Postdoctoral Researcher (Learning on graphs and immune haemato-oncology)**, *Institut Imagine, Université Paris Cité*, Paris, France
Independent research program on immune hemato-oncology with emphasis on myeloid disease and immune dysregulation. Supervision of postgraduate students and contribution to research training.

2025 **Postdoctoral Researcher (Translational Immunology and Mastocytosis)**, *National Reference Center of Mastocytosis*, Paris, France
Translational projects linking genomic and immune features to clinical phenotypes and outcomes; collaborative analyses across multi-centre cohorts.

2022–2025 **Doctoral Researcher (Causality and immunology)**, *Institut Imagine / Institut Curie*, Paris, France
Causal inference for reliable biomarker discovery in haematologic and autoimmune diseases; development of graph-based causal models; analyses across WGS, scRNA-seq, spatial transcriptomics, scDNA-seq, cytometry/, images, and clinical text-derived variables.

2021–2022 **Computational Biologist**, *Institut Imagine*, Paris, France
Methodological leadership on paediatric immuno-haematology cohorts; multi-omic analyses supporting biomarker and mechanism discovery; support to collaborative clinical research pipelines.

2021 **Research and Teaching Assistant**, *Institut Pasteur*, Paris, France
Computational modelling in RNA biology; teaching contribution in RNA structure (lectures and tutorials).

2019 **Research Assistant**, *Institut Pasteur*, Paris, France
Synthetic chromosome design and Hi-C oriented modelling; quantitative analysis of meiotic chromosome conformation.

2016 **Research Assistant**, *Columbia University Medical Center*, New York, USA
Mechanisms of DNA repair in response to chemotherapy-induced interstrand cross-links in *E. coli* and B lymphocytes.

Education and qualifications

2022–2025 **Ph.D. in Immunology**, *Université Paris Cité*, Paris, France
Thesis: *Causal Inference for Reliable Biomarker Discovery: Applications to Cancer and Autoimmune Interactions*. Supervisors: Aude Magérus, Hervé Isambert. Institut Imagine Fellowship laureate.

2019–2021 **Engineering Degree (Applied Mathematics and Statistics)**, *École Polytechnique*, Palaiseau, France
Specialisation: machine learning, statistical learning, graph theory, deep learning, agentic learning, topology, probabilistic modelling and optimisation.

2015–2016 **M.Sc. Biotechnology**, *Columbia University*, New York, USA
Ranked 1st/261.

2012–2022 **Pharm.D. (Pharmaceutical Sciences)**, *Université Paris Cité*, Paris, France
Specialisation: onco-haematology. Thesis: *Omics Analysis and Biomarker Discovery in RALD and Juvenile Myelomonocytic Leukemia*. Graduated *summa cum laude*; nominated for Chancellerie des Universités Award (2023).

2017–2018 **M1 Immunology and Immune Diseases**, *Université Paris Descartes*, Paris, France

2015–2016 **M1 Microbiology and Infectious Diseases**, *Université Paris Descartes*, Paris, France

Funding and awards (selected)

2026 AAP Emergence – Institut National du Cancer (31 k$) (Contributor)

2026 Groupe Français des Myélodysplasies (50 k$) (Contributor)

2025 Innogrant (100 k$)

2025 Fondation Imagine – Postdoctoral Fellowship (100 k$)

2023 Fai2R (60 k$) (Contributor)

2023 Groupe Français des Myélodysplasies (50 k$) (Contributor)

2022 MSD Avenir (600 k$) (Contributor)
2022 Institut Imagine Ph.D. Fellowship (210 k$)
2024 GitHub Award (scikit-learn contribution)
2021 NVIDIA Award for computational support
2023 Pharm.D. thesis nominated for "Prix de la Chancellerie des Universités"

Publications and manuscripts (selected)

Peer-reviewed (selected)

- **Debeaupuis O.**†, Dupuis L.†, Simon F., Isambert H. *CausalCCC: reconstructing intracellular causal pathways of interacting cells*. **Nucleic Acids Research**, 2025.
- **Debeaupuis O.**†, Jeanpierre M.†, , Brunaud C., Yancoski J., Riller Q., Hadjadj J., et al. *In silico modeling guides identification of novel JAK1 variants associated with immune dysregulation*. **EMBO Molecular Medicine**, 2025.
- Stammler R., Chen P., **Debeaupuis O.**, Zhao L.P., Ruyer-Thompson M., et al. *Inflammatory disorders in IDH-mutated myeloid neoplasms: characteristics and response to IDH inhibitors*. **HemaSphere**, 2025.
- Chervov A., Fedoriaka D., ..., **O. Debeaupuis**, et al. *CayleyPy Growth: efficient growth computations and hundreds of new conjectures on Cayley graphs*. *Workshop on Mathematical Reasoning and AI at **NeurIPS***, 2025.
- Gaigne L.P., Besnard C., **Debeaupuis O.**, Degtiar A., Nhat D.H., et al. *Whole exome sequencing in children with autoimmune hepatitis identified mutations in genes involved in the mTORC1 signaling pathway*. **Gastro Hep Advances**, 2025.
- Laffleur B., **Debeaupuis O.**, Dalloul Z., Cogné M. *B cell intrinsic mechanisms constraining IgE memory*. **Frontiers in Immunology**, 2017.

Preprints, in revision, submission (selected)

- **Debeaupuis O.** *Hierarchical biomarker thresholding: a model-agnostic framework for stability*. preprint, 2025.
- **Debeaupuis O.**[1st], Meynier S.†, et al. *A transcriptomic apoptotic signature correlates with leukemia development in pediatric patients with activating KRAS or NRAS mutations*. In revision.
- **Debeaupuis O.**[co-1st], Rossignol J.†, Fedda W.†, et al. *CD62L$^+$CD68$^+$ neutrophils: a potential biomarker for giant cell arteritis*. In revision.
- **Debeaupuis O.** (Co-author) *Defining Clonal Haematopoiesis with Immune Significance (CHIS): a framework for shared mechanisms and therapeutic opportunities*. In revision.

Software and community: Contributor to **scverse**/**scanpy** and **MIIC**; top contributor to **scikit-learn** (2024).

Translational experiences

2018–2019 **CareNKAT© project (CAR-NKT cell therapy development)**, Paris, France
Contributed to preclinical rationale and regulatory documentation (CTD components; patent drafting support) for a CAR-engineered NKT-cell therapy targeting mesothelin in metastatic lung cancer; project subsequently licensed to industry.

Area of expertise

Immunology: Myeloid disease, immune dysregulation, translational immune phenotyping, biomarker development.

Artificial Intelligence: Learning and inference in high-dimensional settings; deep and probabilistic models; theoretical guarantees (generalization, robustness, causality); optimization and control; principles of learning theory.

Quantitative methods: Causal inference, causal network reconstruction, robust decision thresholds, statistical learning, uncertainty quantification.

Programming: Python, R, C++, Perl; scientific computing; tool development; API integration; Git.

Languages: French (native), English (C1), Spanish (B1), Chinese (B1).