

LUCAS RINCÓN DE LA ROSA

AI Scientist — Computational Pathology & Multimodal AI

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Profile

AI scientist completing a PhD in Bioinformatics at the Paris Brain Institute (ICM) and Université Paris-Saclay (submission September 2026), with a background in mathematics, physics, applied mathematics, and machine learning. Specialized in computational pathology and multimodal AI, developing methods across whole-slide imaging, spatial transcriptomics, and single-cell data. Research spans externally validated imaging biomarkers, pathology foundation models, geometric deep learning and optimal transport, and generative AI. Seeking to bring this experience to translational research in pharmaceutical R&D.

Research Experience

PhD Researcher: Computational Pathology & Multi-omics
Paris Brain Institute (ICM), Paris Nov 2023 – 2026

- Developed a UNI-based attention-MIL pipeline for routine H&E whole-slide images and derived an imaging biomarker of morphologic intratumoral heterogeneity predictive of survival in primary CNS lymphoma; validated the biomarker across three independent international multicenter cohorts and used CycleGAN stain normalization to address inter-scanner variability.
- Developed VelOT, a geometric-deep-learning pipeline using optimal transport to infer RNA velocity directly on the data manifold, without kinetic-model assumptions.
- Developed GO3T as a graph-based denoising model for spatial transcriptomics data.
- Co-authored 3 peer-reviewed articles on computational pathology and neuro-oncology imaging/omics (see Publications).

Visiting Researcher, Program for Mathematical Genomics
Columbia University Irving Medical Center Sept – Nov 2025

- Collaborated within Prof. Raúl Rabadán's group (Systems Biology Dept.), applying computational-genomics methods to cancer genomic data as part of ongoing doctoral research on tumor heterogeneity.

Research Intern: Applied Maths & AI
Paris Brain Institute (ICM), Paris Apr – Oct 2023

- Developed deep-learning segmentation models for 2D brain-tumor histology and reconstructed 3D tumor volumes from stacked slides.

Education

PhD, Bioinformatics
Paris Brain Institute / Paris-Saclay Nov 2023 – Nov 2026 (exp.)

MSc, Applied Maths & Machine Learning
Sorbonne Université, Paris 2022 – 2023

BSc, Mathematics & Physics (dual degree)
Universidad Complutense de Madrid 2017 – 2022

Selected Publications

- Morphologic intratumoral heterogeneity from routine whole-slide histopathology predicts survival in primary CNS lymphoma: a multicenter international validation study. *To be submitted Aug. 2026.*
- VelOT: kinetic-free RNA velocity inference using optimal transport and flow-field smoothing. *Preprint.*
- Spatial analysis of paraneoplastic cerebellar degeneration in ovarian cancer with anti-Yo syndrome and SCA1. *Peer-reviewed article, 2025.*
- Quantitative brain MRI analysis in neurodegenerative Langerhans cell histiocytosis. *Peer-reviewed article, 2025.*

Full list & preprints: lucas-rdlr.github.io

Technical Skills

Foundation Models & Geometric Deep Learning

- Pathology foundation models (UNI, CONCH)
- Multiple-instance learning (CLAM)
- Geometric deep learning / Optimal transport
- Generative AI (CycleGAN, PixCell)

Digital Pathology & Spatial Biology

- WSI preprocessing (OpenSlide)
- Nuclei segmentation (HoVer-Net)
- Tissue segmentation
- Multiplex IF / proteomics
- Spatial transcriptomics
- scRNA-seq (Scanpy, AnnData, Scverse)

Programming & Tools

- Python
- R
- Git
- PyTorch

Languages

- Spanish (Native) ● ● ● ● ●
- English (C1) ● ● ● ● ●
- French (C1) ● ● ● ● ●