BIOGRAPHICAL SKETCH

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NAME: Teixeira, Maxime

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POSITION TITLE: Doctoral Candidate, Université Laval; Ph.D. expected 02/2026; incoming postdoctoral fellow, Stanford (anticipated 04/2026)

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Université d'Angers, Angers, France	B.Sc.	09/2013	06/2016	Cellular and molecular biology
Université d'Angers, Angers, France	M.Sc.	09/2017	06/2019	Neurobiology
Université Laval, Québec, Canada	Ph.D.	09/2019	12/2025	Neurobiology / Molecular medicine
Stanford, California, USA	Postdoctoral Fellowship	est. 04/2026	est. 2030	Neurobiology / Cell systems

A. Personal Statement

I began my academic training at the University of Angers in cellular and molecular biology, where an internship with Dr. Éric Lelièvre introduced me to experimental science through a project on estrogen receptor signaling in triple-negative breast cancer – my first exposure to cell and systems biology. In the first year of my M.Sc., I completed a three-month internship with Prof. Dominique Couez and Dr. Laetitia Aymeric investigating how gut-microbiota–driven inflammation shapes microglial clearance of apoptotic tumor cells, which sparked a lasting interest in neuroimmunology and the microbiome while strengthening my skills in cell culture and immunofluorescence. In the second year, a six-month internship with Prof. Jean-Michel Panoff and Dr. Caroline Amiel expanded my expertise to bacterial culture and *in vitro* microbiome assays I evaluated the impact of six common dietary pesticides on gut microbial communities and, through a collaborative effort, published two papers as second author in two high-impact journals[1,2]. The emerging link between dysbiosis, environmental exposures, and neurodegeneration motivated me to focus on Parkinson's disease (PD). I joined Dr. Abid Oueslati's lab, where I developed strong proficiency in biochemistry, systems biology, molecular cloning, iPSC culture and differentiation, and optogenetics. During my Ph.D., I contributed to multiple projects on protein aggregation in PD and received several awards for posters, talks, and microscopy images. I co-developed a new optobiology model to study α-synuclein (aSyn) aggregation, publishing the work (co-author[3]) and a detailed step-by-step protocol (first author[4]). I also co-developed a rapid protocol to generate human iPSC-derived A9-like dopaminergic neurons in ≤21 days (co-first author[5]) and authored an accompanying protocol[6] now adopted by the community. Using these tools, I addressed how aSyn assemblies interface with the endolysosomal system and mitochondria in PD pathogenesis. I showed that aSyn oligomerization disrupts mitochondrial metabolism (co-author[7]) and that aSyn transitions engage key endolysosomal proteins (first author[8]). Building on this work, I recently submitted a first-author manuscript to *Nature Neuroscience* on the molecular events at endolysosomal membranes during aSyn assembly and a co-authored study deeply characterizing inclusions in dopaminergic neurons in revision to *Science Advances*. My super-resolution expertise has also led to collaborative contributions studying other neurodegenerative diseases like Huntington's and Alzheimer's disease[11].

The proposed postdoctoral project will expand my expertise from neuron-intrinsic aSyn biology to the multicellular mechanisms that govern aSyn clearance and propagation in human brain–relevant systems. In the Wernig lab at Stanford, I will leverage a fully human iPSC-derived triculture (dopaminergic neurons, astrocytes, microglia) that recapitulates Lewy-body–like pathology to define how neuron–glia interactions shape lysosomal

degradation, intercellular transfer, and toxicity across diverse pathogenic aSyn inputs (PFFs, *de novo* aggregation systems, and PD brain–derived Lewy material). This fellowship will train me in cell-type-resolved lysosome profiling (LysoIP), CRISPR iPSC engineering of PD-linked lysosomal mutations (e.g., LRRK2, TMEM175, ATP13A2), and single-cell transcriptomic analyses to map lysosomal stress and inflammatory programs, while building on my strengths in aSyn aggregation models, quantitative biochemistry, and advanced microscopy. This combined mechanistic and translational training – supported by Stanford's outstanding stem cell, genomics, proteomics, and imaging environment – will position me to establish an independent research program focused on how cell-type-specific proteostasis and neuroimmune crosstalk drive aSyn pathology and how these pathways can be targeted to slow PD progression. I am confident this training and research plan will strengthen my academic trajectory and position me to establish an independent laboratory in the United States focused on the determinants of protein aggregation (especially aSyn) and how these assemblies drive neuronal dysfunction in PD.

B. Positions, Scientific Appointments and Honors

Positions and Scientific Appointments

2022 – 2022 Visiting scholar (Ph.D.) in Dr. Hilal Lashuel's lab (Lausanne, Switzerland)
2021 – 2024 Member (executive committee) of Neuro Québec consortium (Québec, Canada)
2019 – 2026 Ph.D. student in Dr. Abid Oueslati's lab (Québec, Canada)
2019 – 2019 Internship (M.Sc.) in Dr.Caroline Amiel and Prof. Jean-Michel Panoff labs (Caen, France)
2018 – 2018 Internship (M.Sc.) in Dr. Laetitita Aymeric and Prof. Dominique Couez labs (Angers, France)
2017 – 2017 Intern (B.Sc) in Dr. Eric Lelièvre lab (Angers, France)

Honors

2025 Congress award – Research days of the Faculty of Medicine (ULaval) – Best oral presentation.
2025 Competitive scholarship from Université Laval to support the funding for the end of the thesis.
2024 Congress award – GBA1 international Canada meeting – Best trainee poster presentation.
2024 Congress award – Research days of the Faculty of Medicine (ULaval) – Best oral presentation.
2024 Competitive microscopy photo contest – ACFAS – Image selected among thousands.
2024 Competitive microscopy photo contest – Neuro Québec – Best image selected.
2024 Competitive microscopy photo contest – Neuroscience Axis CHU-ULaval – Best image selected.
2024 Highly competitive photo contes – Nikon Small World – Image selected (Image of distinction).
2023 Nominated and recognize as a "rising star student" among all the students of the CRCHUQ ULaval.
2023 Congress award – 11th Department of Molecular Medicine Day – Best Oral presentation.
2023 Travel award for the CAN2023 congress.
2023 Competitive microscopy photo contest – Neuroscience Axis CHU-ULaval – Best image selected.
2022 Highly competitive funding to support my research project. https://doi.org/10.69777/315114 (FRQS).
2022 Scholarship awarded to support my research project – Parkinson QuébecChaudière-Appalaches.
2022 Competitive funding awarded based on the excellence of my CV – Mensa Scholarship Program.
2022 Competitive doctoral merit scholarship – Caisse Desjardins de Limoilou
2022 Congress award – 10th Department of Molecular Medicine Day (ULaval) – Best Oral presentation.
2022 Competitive microscopy photo contest – ACCEM (ULaval) – Best image selected.
2021 Seminars of the Neuroscience Axis – Neuroscience Axis CHU-ULaval – Best Oral presentation.
2021 Award from Université Laval for the successful predoctoral examination.
2020 Didier-Mouginot Prestige scholarship to support my research - CHUQ Foundation
2019 Competitive microscopy photo contest – Neuroscience Axis CHU-ULaval – Best image selected.
2011 Seven years funding obtained to support my studies in France – CROUS

C. Contributions to Science

1. **Master of Science**: My early-career work examined how six widely used dietary pesticides affect gut microbial communities. In collaboration with two international teams – the Ramazzini Institute in Italy (Drs. Fiorella Belpoggi and Daniele Mandrioli) and King's College London (Drs. Robin Mesnage and Michael Antoniou) – I investigated whether purified pesticides, individually and in mixtures, alter commensal bacterial growth at doses below typical European dietary exposure. My specific contribution

was to quantify growth dynamics and metabolic readouts in commensal species under sub-toxic conditions. We found that these pesticides, even at low doses, produced marked metabolic perturbations without overt cytotoxicity, consistent with pesticide-driven shifts in gut microbial function in Sprague–Dawley rats.

[1] Mesnage, R. et al. Multi-omics phenotyping of the gut-liver axis reveals metabolic perturbations from a low-dose pesticide mixture in rats. **Commun Biol** 4, 471 (2021). https://doi.org/10.1038/s42003-021-01990-w
[2] Mesnage, R. et al. Use of Shotgun Metagenomics and Metabolomics to Evaluate the Impact of Glyphosate or Roundup MON 52276 on the Gut Microbiota and Serum Metabolome of Sprague-Dawley Rats. **Environ Health Perspect** 129, 17005 (2021). https://doi.org/10.1289/ehp6990

2. **Graduate Career (Ph.D**.): My graduate research centers on protein aggregation in neurodegenerative disease, with a primary focus on α-synuclein in Parkinson's disease (PD). I first developed disease-relevant models by co-creating an optogenetically inducible aggregation system in newly generated A9-like dopaminergic neurons derived from human pluripotent stem cells. Using these platforms, I defined how α-synuclein assemblies engage the endolysosomal system and delineated the consequences for both the protein and vesicular function – addressing a long-standing gap in the field. I identified a previously unrecognized aggregation pathway involving WDR44, a candidate regulator of α-synuclein assembly[9]. In collaboration with Dr. Hilal Lashuel's laboratory, I further characterized the formation of Lewy-body–like inclusions in our A9 dopaminergic neurons[10]. In parallel, I applied super-resolution microscopy expertise to collaborative studies probing tau biology in Huntington's disease[11], as well as a new study involving the characterization of the non-Exon 1 part of mHtt[12].

[3] Bérard, M. et al. A light-inducible protein clustering system for in vivo analysis of α-synuclein aggregation in Parkinson disease. **PLOS Biology** 20, e3001578 (2022). https://doi.org/10.1371/journal.pbio.3001578
[4] Teixeira, M., Sheta, R., Idi, W. & Oueslati, A. Optogenetic-mediated induction and monitoring of α-synuclein aggregation in cellular models of Parkinson's disease. **STAR Protoc** 4, 102738 (2023). https://doi.org/10.1016/j.xpro.2023.102738
[5] Sheta, R. et al. Combining NGN2 programming and dopaminergic patterning for a rapid and efficient generation of hiPSC-derived midbrain neurons. **Scientific Reports** 12, 17176 (2022). https://doi.org/10.1038/s41598-022-22158-4
[6] Sheta, R., Teixeira, M., Idi, W. & Oueslati, A. Optimized protocol for the generation of functional human induced-pluripotent-stem-cell-derived dopaminergic neurons. **STAR Protoc** 4, 102486 (2023). https://doi.org/10.1016/j.xpro.2023.102486
[7] Lurette, O. et al. Aggregation of alpha-synuclein disrupts mitochondrial metabolism and induce mitophagy via cardiolipin externalization. Cell Death Dis 14, 729 (2023). https://doi.org/10.1038/s41419-023-06251-8
[8] Teixeira, M. et al. Combining light-induced aggregation and biotin proximity labeling strongly implicates endolysosomal proteins in early α-synuclein oligomerization. **iScience**, 112823 (2025). https://doi.org/10.1016/j.isci.2025.112823
[9] Teixeira M. et al. WDR44 drives de novo α-synuclein aggregation at lysosomal membranes and promotes neuronal dysfunction in Parkinson's Disease. Submitted to **Nature Neuroscience** (December 2025).
[10] Mahul-Mellier, A. et al. Recapitulating Parkinson's Pathology in Human iPSC Dopaminergic Neurons: New Mechanistic Insights into Lewy Body Formation and heterogeneity. In revision to **Science Advances** (November 2025). Preprint: https://www.biorxiv.org/content/10.1101/2025.10.26.684610v2
[11] E. Lepinay et al. The impact of tau deletion on Huntington's disease: an in vivo perspective. **Molecular Therapy** (2025). https://doi.org/10.1016/j.ymthe.2025.11.033
[12] Cardim-Pires et al. Huntingtin proteolysis generates non-exon 1 fragments that aggregate and accumulate in the brains of Huntington's disease patients. In preparation for submission.

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More details about me and my work are available on my website:
https://www.teixeira-neuro.com/who-am-i