Curriculum Vitae

NAME: Dr. Julie Jacquemyn

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POSITION TITLE: Postdoctoral fellow

Education, training and scientific appointments

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Start Date MM/YYYY	Completion Date MM/YYYY	FIELD OF STUDY
Artesis Plantijn (Antwerp/Belgium)	BSc	Sept/2008	Jun/2011	Pharmaceutical and Biomedical Sciences
University of Antwerp – Faculty of Pharmaceutical, Biomedical and Veterinary Sciences (Antwerp/Belgium)	BSc + MSc	Sept/2011	Jun/2015	Biochemistry and Biotechnology, specialization in Neurosciences
CECAD – Cologne – University of Cologne - Institute for genetics (Cologne/Germany)	MSc internship + Fellowship student	Oct/2015	Feb/2016	Neuroscience
KUL-VIB Center for Brain and Disease Research (Leuven/Belgium)	PhD	April/2016	April/2021	Biomedical Sciences – Cognitive and Molecular Neurosciences
University of Alberta – Department of physiology and cell biology – Lab of Dr. Maria S. Ioannou	Postdoctoral fellow	Jan/2022	ongoing	Cell biology of lipids – Neuroscience

A. Personal Statement

Training

My research journey as a PhD student began at VIB-KU Leuven where I studied the cellular dysfunction caused by TorsinA mutations[a]. These mutations are associated with two incurable diseases; autosomal dominant childhood-onset dystonia and autosomal recessive congenital syndromes. Dystonia is the third most common movement disorder after essential tremor and Parkinson's disease and affects 50,000 people in Canada. Because there is no cure for dystonia, the symptoms worsen over time and greatly reduce the quality of life for patients. Previous studies found reducing a lipid phosphatase (called lipin) rescues dystonia phenotypes in cultured cells, flies and mice. This suggested that lipids may be key to pathogenesis but it was unknown how lipids are associated with dystonia-mutations in TorsinA. Through a combination of genetic screens, cell biology investigations and mechanistic studies, I discovered that TorsinA initiates a lipid cascade, through a protein complex (called CTDNEP1/NEP1R1), at the nuclear envelope to facilitate the insertion of nuclear pores. Moreover, I elucidated how these pathways regulate the shape of the nuclear membrane in post-mitotic cells, a process that is dysregulated in neurons with dystonia. This led to new biological insights and potential therapeutic targets which can be applied for a series of related human diseases. I presented these seminal findings at multiple international conferences: EMBO lipids in health and disease (Dresden, Germany), FASEB (USA, but virtual due to COVID), ASCB (USA, but virtual due to COVID). Have garnered significant recognition in the field, has resulted in many follow-up studies based on my work: by Dr. Shirin Bahmanyar (PMID(s): 38776370, 34556392,37795681, 3738266 and 32530796, Yale University, USA) and Dr. William T. Dauer (PMID(s): 37547008 and 37162852, UT Southwestern Medical Center, USA).

For my second project as a PhD student, I continued to explore the role of lipids in regulating neuronal function but this time in Parkinson's disease[b]. Parkinson's disease is a movement disorder that is closely related to dystonia and affects 1 in 500 Canadians and over 10 million people globally. While lipid dysregulation has emerged as central to Parkinson's disease pathology, the link between lipid alterations and several causative genes was unclear. One such example is *DNAJC6/Auxillin.* I discovered that Parkinson's disease mutations in *DNAJC6/Auxillin* dysregulate phospholipids by regulating another gene implicated in Parkinson's disease, *SYNJ1/synaptojanin*. My work established a new interaction between these two Parkinson's disease genes and delineated a novel pathway contributing to the disease. These findings were corroborated by the research team of Dr. Pietro De Camilli (PMID: 36792618, Yale University, USA) which supports the strength of the findings. As such we published our studies together as companion papers and anticipate that further studies on auxilin and synaptojanin will provide valuable insight into mechanisms that drive PD pathology.

I next joined Dr. Ioannou's lab as a postdoctoral researcher to gain expertise in new cellular model systems and advanced quantitative microscopy. Building on these newly acquired skills, I explored the role of lipids in Parkinson's disease (PD) pathology, specifically focusing on how lipid alterations contribute to mechanisms of α-synuclein spread. By targeting the sphingolipid pathway, I discovered that increased glucosylceramides induce ectosome shedding in primary neurons, including dopaminergic neurons derived from PD patient iPSCs with mutations in *GBA1* (N370S, L444P, W3789G) and *LRRK2* (G2019S, R1441H). This effect was also observed in neurons from living mouse brains using 2-photon microscopy. Our results showed that these ectosomes, loaded with pathogenic α-synuclein, are internalized by neighbouring neurons, leading to the transmission of α-synuclein pathology. This work uncovers ectosomes as a critical route for α-synuclein transmission, which is observable only through live-cell imaging techniques[c]. I presented this work at multiple occasions including at the AD-PD international conference in 2025 in Vienna, and Lipids in health and disease symposium in Hasselt, where leading experts in neurodegenerative disease and lipid biology research come together.

Career goals

I am committed to advancing Parkinson's disease (PD) research through a multidisciplinary approach combining imaging, lipidomics, and cellular biology to uncover mechanisms of disease progression. My training, from pharmaceutical lab technician to MSc, PhD, and now postdoctoral researcher, has provided a strong foundation in these areas. From my postdoctoral project multiple side projects has stemmed including this SMase project.
My goal is to work still together with Dr. Maria Ioannou during the mentored phase. I plan to expand my expertise in computational lipidomics, neuroinflammation assays, in vivo PD models, other imaging techniques including TIRF and analysis of FIB-SEM data. This, while future developing leadership, mentoring, and grant-writing skills. In the independent phase, I will establish a research program on extracellular vesicles, lysosomal dysfunction, lipid metabolism, and neuroinflammation, with the goal to secure funding, build collaborations, and ultimately lead an independent lab translating fundamental mechanisms into therapeutic strategies.

a. Jacquemyn J, Foroozandeh J, Vints K, Swerts J, Verstreken P, Gounko NV, Gallego SF & Goodchild R (2021) *Torsin and NEP1R1-CTDNEP1 phosphatase affect interphase nuclear pore complex insertion by lipid-dependent and lipid-independent mechanisms.* EMBO J 377: 1–21

b. Jacquemyn J*, Kuenen S*, Swerts J, Pavie B, Vijayan V, Kilic A, Chabot D, Wang Y, Schoovaerts N, Corthout N & Verstreken P (2023) *Parkinsonism mutations in DNAJC6 cause lipid defects and neurodegeneration that are rescued by Synj1*. npj Parkinsons Dis. 9, 19

c. Jacquemyn J, Mariott B, Chang J, Lee N Y J, Atonal L F R, Green C, Wong J, Chik K, Acevedo-Morantes C, Chen X.-Q. C, Nicouleau M, You Z, Deneault E, Abdian N, Durcan M. T, Jackson J & Ioannou MS. (2026). *Glucosylceramide induced ectosomes propagate pathogenic α-synuclein in Parkinson's disease*. Nature Cell Biology 28, 492-506.

B. Honors and awards

2026 - Med Star Award for Postdoctoral or clinical fellows – April 2026
2025 – Awarded a Fellowship of the Parkinson Association of Alberta – September 1st 2025 – 1 year funding
2025 – Best oral presentation award on Lipids in Disease Symposium – 10th-12th of September - Hasselt – Belgium
2025 – Postdoctoral Fellowship Association Travel Award - August 15 2025

2024-2025 - Scientific work selected to be part of CONNECTIONS - Exhibition at the Royal Alberta Museum, Edmonton.
2023 - 2025 – EMBO Postdoctoral fellowship – Investigating the role of lipid alterations in Parkinson's disease (ALTF-120-2022).
2022 - 2023 – NMHI Postdoctoral fellowship – Dr. Rowland and Muriel Haryett Fund for Innovation in Neuroscience - Investigating the converging role of lipid alterations in Parkinson's Disease.
2024 – Cover image Prize, Trends in Cell Biology, volume 34, issue 7
2019 – Best Poster Presentation Prize, Lipid Function in health and Disease, EMBO, Dresden
2016 - 2020 – PhD Fellowship FWO Research Foundation Flanders
2015 – Cover image Prize, mitochondrial dysfunction in aging, BBA volume 1847, issue 11
2015 – KVCV Prize for the most meritorious student of Biochemistry and Biotechnology – University of Antwerp

C. Contributions to Science

C1. Presentations

1. (2026) - Glucosylceramide induced ectosomes propagate pathogenic α-synuclein. Gene therapy Coffee Club – Health Canada
2. (2026) – Tiny Bubbles Big impact: How Brain Fats May Spread Parkinson's Disease – Lunch and Learn – Parkinson Association of Alberta
3. (2026) - Glucosylceramide induced ectosomes propagate pathogenic α-synuclein. Poster and Talk – NMHI research day
4. (2026) - Glucosylceramide induced ectosomes propagate pathogenic α-synuclein. WashU Medicine – Hope Center Lipid Metabolsim Group
5. (2025). Glucosylceramide induced ectosomes propagate pathogenic α-synuclein. Lipids in Disease Symposium – Hasselt – Belgium.
6. (2025). Lipid Alterations Shape Movement Disorder Pathways: From Dystonia to Parkinson's Disease. UCL Queen Square Institute of Neurology, London.
7. (2025). Glucosylceramide induced ectosomes propagate α-synuclein in Parkinson's disease. AD/PD 2025, Vienna.
8. (2025). Glucosylceramide induced ectosomes propagate α-synuclein in Parkinson's disease. Cell Biology Research Day, Edmonton, Canada.
9. (2024). The impact of Parkinson's disease-associated lipid alterations on α-synuclein release. Neuroday - Immunomodulation, Braga, Portugal.
10. (2024). Glucosylceramide induced ectosomes propagate pathogenic α-synuclein in Parkinson's disease. Physiology Research Day, Edmonton, Canada.
11. (2020). The Torsin/ NEP1R-CTDNEP1/ Lipin axis regulates lipid metabolism for lipid droplets, cell growth, organelle volume and nuclear pore complex insertion. FASEB virtual science research conference on lipid droplets in health and disease, Rockville, United States of America.
12. (2020). Torsin suppresses the nuclear envelope NEP1R1-CTDENP1/Lipin lipid metabolism pathway for
13. nuclear pore complex biogenesis. VIB-NERF, Leuven, Belgium.
14. (2019). Ctdenp/nep1r1 - lipin pathway in TOR1A Disease. Foundation for Dystonia Research, Leuven,
15. Belgium.
16. (2019). Torsin regulation of lipid metabolism in nuclear membrane remodeling and disease. ASCB/EMBO meeting, Washington DC, United States of America.
17. (2019). The Ctdnep1/Nep1r1 - Lipin pathway in Tor1A disease. CBD Science Day - VIB, Leuven, Belgium
18. (2019). Lipid enzyme dysfunction is pathogenic in TOR1A disease(s). EMBO lipids in disease and health, Dresden, Germany.

C2. Collaborations

Collaboration has played a key role in my research, and I have had the privilege of working with several leading scientists in the field. For instance, I recently collaborated with Dr. Hugo Bellen, a renowned expert in Parkinson's disease, on a project investigating the role of Tau in glial cells. Our research focused on how Tau regulates lipid droplets and mitigates reactive oxygen species (ROS), and the results were published (PMID: 39187706). I am also collaborating with Dr. Simonetta Sipione from the University of Alberta on a project exploring the role of gangliosides in exosome formation, further strengthening my contributions to the field of extracellular vesicles.

Additionally, I am planning future collaborative projects with Dr. Christian Metallo at Salk Institute for Biological Studies of California and Dr. James Jepson at University College London. These projects will focus on lipid metabolism and neuronal function, which I believe will yield important insights for the scientific community.

C3. Publications

1. **Jacquemyn J**, Mariott B, Chang J, Lee N Y J, Atonal L F R, Green C, Wong J, Chik K, Acevedo-Morantes C, Chen X.-Q. C, Nicouleau M, You Z, Deneault E, Abdian N, Durcan M. T, Jackson J & Ioannou MS. (2026). *Glucosylceramide induced ectosomes propagate pathogenic α-synuclein in Parkinson's disease*. Nature Cell Biology 28, 492-506.
   Link: https://www.nature.com/articles/s41556-026-01871-6
2. Atonal L F R, Chang J, **Jacquemyn J**, Ralhan I, Ilarraza I & Ioannou MS. (2025). *Glutamate decreases oxidative stress and lipid droplet biogenesis in astrocytes*. J Cell Sci. 2025 Sep 17:jcs.263983. Link: https://doi.org/10.1242/jcs.263983
3. Goodman LD, Ralhan I, Li X, Lu S, Moulton MJ, Park YJ, Zhao P, Kanca O, Ghaderpour Taleghani ZS, **Jacquemyn J**, Shulman JM, Ando K, Sun K, Ioannou MS, Bellen HJ. (2024). *Tau is required for glial lipid droplet formation and resistance to neuronal oxidative stress*. Nat Neuroscience.
   Link: https://rdcu.be/dTOKb
4. **Jacquemyn J**, Ralhan I, Ioannou MS. (2024). *Driving factors of neuronal ferroptosis*. Trends Cell Biology. 34(7): 535-546.
   Link: https://doi.org/10.1016/j.tcb.2024.01.010
5. Bae J, **Jacquemyn J** & Ioannou MS. (2024). *Neuronal AMPK regulates lipid transport to microglia*. Trends in Cell Biology. 34(9): 695-697.
   Link: https://doi.org/10.1016/j.tcb.2024.08.001
6. **Jacquemyn J**, Kuenen S, Swerts J, Pavie B, Vijayan V, Kilic A, Chabot D, Wang YC, Schoovaerts N, Corthout N, Verstreken P. (2023). *Parkinsonism mutations in DNAJC6 cause lipid defects and neurodegeneration that are rescued by Synj1*. NPJ Parkinsons Dis. 9(1)
   Link: https://rdcu.be/dTOLz
7. **Jacquemyn J**, Foroozandeh J, Vints K, Swerts J, Verstreken P, Gounko NV, Gallego SF, Goodchild R. (2021). *Torsin and NEP1R1-CTDNEP1 phosphatase affect interphase nuclear pore complex insertion by lipid-dependent and lipid-independent mechanisms.* EMBO J. 40(17): e106914.
   Link: https://doi.org/10.15252/embj.2020106914
8. Praschberger R, **Jacquemyn J**, Verstreken P. (2021). *Molecule-to-Circuit Disease Mechanisms of a Synaptic SNAREopathy*. Neuron. 109(1): 1-3.
   Link: https://doi.org/10.1016/j.neuron.2020.12.009
9. **Jacquemyn J***, Cascalho A* & Goodchild RE (2017) T*he ins and outs of endoplasmic reticulum-controlled lipid biosynthesis*. EMBO Rep 18: 1905–1921
   Link: https://doi.org/10.15252/embr.201643426
10. Cascalho A, **Jacquemyn J** & Goodchild RE (2017) *Membrane defects and genetic redundancy: Are we at a turning point for DYT1 dystonia*? Mov Disord 32
    Link: https://doi.org/10.1002/mds.26880
11. Wang S, **Jacquemyn J**, Murru S, Martinelli P, Barth E, Langer T, Niessen CM & Rugarli EI (2016) *The Mitochondrial m-AAA Protease Prevents Demyelination and Hair Greying*. PLoS Genet 12: e1006463
    Link: https://doi.org/10.1371/journal.pgen.1006463

Google scholar link: https://scholar.google.ca/citations?hl=en&user=9ZFN8UEAAAAJ

D. Supervision, Teaching & Academic Engagement

D1. Supervision of students

- Ken Reyes – PhD student in Dr. Simonetta Sipione lab – Investigating the role of GM1 in exosome formation - University of Alberta – (2024-…)
- Kennedi Chik – Master student – Unravelling the triggers of ectosome formation - University of Alberta – (2024-2026)
- Ehlam Ifthikar – Invesitgating the role of sphingomyelinases in ectosome formation in PD – University of Alberta – undergraduate student - PHYSL 468/469 thesis (2024-2025)
- Ceili Green – Bachelor Thesis - Lipid effect on ectosome formation in Parkinson's Disease – University of Alberta – PHYSL 467 (2023-2024)
- Jeremy Wong – Bachelor Thesis - Exploring Glucosylceramide and Sphingomyelin Metabolism in Ectosome Formation and its Potential Role in Parkinson's Disease – University of Alberta – PHYSL 468/469 thesis (2023-2024)

- Sara Garcia Garotte – Bachelor Thesis - Plantijn student Bachelor Biomedische Laboratoriumtechnologie (2019-2020)
- Noémie De Broeck – Bachelor Thesis - Plantijn student Bachelor Biomedische Laboratoriumtechnologie (2018-2019)
- Laura Ordonez Cuerva - Internship - Erasmus Student (Summer 2019)
- Wouter Willems - Internship - secondary student (2018)
- Tom Willems – Master Thesis - KUL master student Biomedical Sciences (2017 - 2018)
- An Knoops - Internship - KUL master student Biomedical Sciences (2017)
- Mattias Winant - Internship - KUL master student Biomedical sciences (2016)

D2. Teaching experience

- Hot Topic Class (Academic Year 2018-2019) – Master course – Scientific Paper Discussion
- Hot Topic Class (Academic Year 2017-2018) – Master course – Scientific Paper Discussion
- Physl 310 Winter (Academic Year 2025-2026) – Image analysis course

D3. Others

- Judging presentations for the 58th Annual Summer Research Day – August 22, 2025
- Part of Organizing Team of the 8th PhD symposium VIB/NERF - 2019
- Part of Organizing Team FlyClub from 2019 - 2021