

Patrick Allaire, Ph.D

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PROFESIONNAL SUMMARY

Ph.D.-trained scientist and bioinformatician with 20+ years of experience in genetics, biomedical informatics, and translational research. Skilled at integrating large-scale genomic and EHR datasets to uncover disease mechanisms, assess variant impact, and advance precision medicine. Proven success in variant interpretation, mechanistic modeling, and PheWAS, with expertise in gene function, systems biology, and high-throughput molecular assays. Experienced mentor and collaborator with leadership in biobank initiatives and a strong publication record. Currently focused on strengthening and expanding skills in machine learning and AI for big-data analysis and biomedical tool development, with a passion for bridging research and patient care, mentoring future scientists, and driving innovation through Biomentis LLC.

KEY SKILLS & EXPERTISE

- **Mentorship & Training** (high school to graduate students and lab technicians, research methods, data analysis, communication)
- **Genetics & Functional Genomics** (variant analysis, screening, gene structure-function)
- **Biomedical Informatics** (genomic/EHR/phenomic integration, All of Us workbench)
- **Data Science** (R, Python, SQL, cloud pipelines)
- **Machine Learning & AI** (big-data analysis, predictive modeling, workflow optimization)
- **Molecular & Cell Biology** (protein characterization, vesicle trafficking, signaling pathways)
- **Oncology & Cancer Biology** (M.Sc. Cancer Biology, genetic cancer risk studies)
- **High-Throughput Assays & Omics** (qPCR, analysis pipelines, proteomics, LC-MS)
- **Scientific Writing & Review** (grants, manuscripts, literature synthesis, reporting)
- **Leadership & Collaboration** (NIH-funded projects, cross-site team collaboration)
- **Communication** (international presentations, knowledge translation, client-facing consulting)

PROFESSIONAL EXPERIENCE

Project Scientist

Marshfield Clinic Research Institute | Marshfield, WI | 2017 – Present

- Managed NIH-funded translational genomics projects, including the All of Us Research Program, integrating WGS with EHR data to uncover genotype–phenotype associations.
- Designed and validated a qPCR telomere assay applied to >85,000 samples; implemented cloud-based WGS pipelines for >5,000 individuals.
- Led PheWAS analyses connecting genetic variation with phenotypes, including cancer susceptibility, drug response, and infection risk.
- Collaborated with clinicians, academic investigators, and bioinformaticians partners to translate findings into precision medicine.
- Supervised technicians and established GLP-like standards for assay reproducibility.
- Contributed manuscripts and presented results at major international conferences.

Postdoctoral Fellow – Genetics & Advanced Microscopy

University of Utah | Salt Lake City, UT | 2011 – 2017

- Investigated vesicular pathways and genetic determinants of peptide-hormone transport.

- Applied *in vivo* super-resolution microscopy to monitor vesicle trafficking.
- Mentored students and coordinated multi-lab collaborations, ensuring rigor and reproducibility.

Temporary Postdoctoral Fellow – Cancer Biology (Glioblastoma)

McGill University | Montreal, Canada | 2010 – 2011

- Extended Ph.D. discoveries in molecular signaling into glioblastoma research, investigating how dysregulated pathways contribute to tumor progression.
- Strengthened translational cancer expertise through collaboration with oncology research groups.

Ph.D. – Neuroscience (Molecular & Cellular Biology focus)

McGill University | Montreal, Canada | 2003 – 2010

- Used proteomics to identify and characterize novel proteins in clathrin-coated vesicle trafficking, leading to a breakthrough discovery published in *Molecular Cell*.
- Applied biochemistry, proteomics, and microscopy to validate molecular mechanisms.
- Optimized protocols and assays for reproducibility and scalability, advancing understanding of intracellular transport.
- Awarded the C. Nance Common Neuroscience Award for contributions to molecular neuroscience.

M.Sc. – Experimental Medicine (Oncology focus)

McGill University | Montreal, Canada | 2000 – 2003

- Investigated cancer signaling pathways, applying cell biology and biochemical approaches.
- Built foundational expertise in oncology and translational cancer research.

EDUCATION

Ph.D. in Neuroscience | McGill University, Canada | November 2009

M.S. in Experimental Medicine | McGill University, Canada | January 2003

B.S. in Biochemistry | University de Montreal, Canada | June 2000

TRAINING & CERTIFICATION

Summer Institute for Statistical Genetics | Washington University, USA | July 2023

- Probability, Statistical Interference, and Statistical Genetics
- Gene Expression
- Pathway and Network Analysis

Great Learning: Generative AI for Business with Microsoft Azure OpenAI | May 2025

- Leveraging Generative AI for Business Applications
- Python for Generative AI
- Designing Generative AI Solutions with Azure Open AI
- Azure AI Fundamentals

Artificial Intelligence in Pharma and Biotech | MIT Sloan School of Management | Oct, 2025

- The landscape of AI in the pharmaceutical industry: Python for Generative AI
- Using AI for early drug discovery: From small molecules to biologics
- Modeling the biological underpinning of disease
- Biomarkers, discovery, and patient stratification
- Design and management of clinical trials
- Business and innovation in pharma

HONORS & AWARDS

Nance Common Neuroscience Award | Montreal Neurological Institute | Canada | 2011

American Heart Association Postdoctoral Fellow Award | USA | 2013

SELECTED PEER-REVIEWED PUBLICATION

1. **Allaire P**, et al. Phenome-wide association study identifies new clinical phenotype associated with *Staphylococcus aureus* infections. *PLoS One*. 2024. PMID: 38968223.
2. **Allaire P**, et al. Familial renal glycosuria and potential pharmacogenetic impact on SGLT2 inhibitors. *Kidney360*. 2024. PMID: 3941288.
3. Sathipati SY, Tsai MJ, Aimalla N, Moat L, Shukla SK, **Allaire P**, et al. Evolutionary learning-based method for circulating miRNA signature in breast cancer diagnosis prediction. *NAR Genom Bioinform*. 2024. PMID: 38406797.
4. **Allaire P**, et al. Genetic and clinical determinants of telomere length. *HGG Adv*. 2023. PMID: 37216007.
5. Sathipati SY, Tsai MJ, Carter T, **Allaire P**, et al. Survival estimation in gastric and esophageal carcinoma using miRNA expression profiles. *Comput Struct Biotechnol J*. 2022. PMID: 36051876.
6. LaBella ML, Hujber EJ, Moore KA, Rawson RL, Merrill SA, **Allaire PD**, et al. Casein Kinase 1 δ stabilizes mature axons by inhibiting transcription termination of ankyrin. *Dev Cell*. 2020. PMID: 31910362.
7. **Allaire PD**, et al. Analysis of connecdenn 1–3 (DENN1A–C) GEF activity for Rab35. *Methods Mol Biol*. 2015. PMID: 25800846.8.
8. **Allaire PD**, et al. Rab35–Arf6 interplay controls cargo recycling and cell migration. *J Cell Sci*. 2013. PMID: 23264734.
9. **Allaire PD**, et al. Connecdenn DENN domain is a Rab35 GEF mediating cargo-specific exit from early endosomes. *Mol Cell*. 2010. PMID: 20159556.
10. **Allaire PD**, et al. Connecdenn, a novel DENN protein in neuronal clathrin-coated vesicles. *J Neurosci*. 2006. PMID: 17182770.
11. Girard M, **Allaire PD**, et al. Isolation of clathrin-coated vesicles by centrifugation. *Curr Protoc Cell Biol*. 2005. PMID: 18228473.
12. Girard M, **Allaire PD**, et al. Proteomics of clathrin-coated vesicles reveals nonstoichiometric chain composition. *Mol Cell Proteomics*. 2005. PMID: 15933375.
13. Blondeau F, Ritter B, **Allaire PD**, et al. Tandem MS analysis of brain clathrin-coated vesicles in synaptic recycling. *PNAS*. 2004. PMID: 15007177.

MANUSCRIPT IN REVIEW

Allaire PD, et al. Long-telomeropathy is associated with tumor predisposition syndrome. *In review at "Cell Genomic"*.

PRESENTATIONS & INVITED TALKS

Annual Meeting for Cell Biology | oral presentation | San Francisco | **2005**

Annual Meeting for Cell Biology | Washington | DC. | **2007**

Annual Meeting for Cell Biology | San Diego | **2009**

Annual Meeting for Cell Biology | Philadelphia | **2010**

Annual Meeting for Cell Biology | Denver | **2011**

Gordon Research Conference, "Protein Trafficking, Processing and Secretion" | New London, NH | **2014**

C. elegans International Genetic Meeting | Los Angeles | **2015**

Gordon Research Conference “Molecular Membrane Biology” | Andover | **2015**

Gordon Research Conference “Protein Trafficking, Processing and Secretion” | New London | **2016**

PROFESSIONAL AFFILIATIONS

American Society for Cell Biology | **2006 to 2010**

American Heart Association | **2013 to 2016**

Genetic Society of America | **2011 to 2018**

LANGUAGES

French: Fluent - Native Language

English: Fluent

ADDITIONAL INFORMATION

Citizenship: Canadian

Green Card Holder – permanent residence status since July 2021