

Nguyen Phuong PHAM, Ph.D.

**Areas of Expertise: Genomics – Bioinformatics –
Microbiology – Microbial ecology – Molecular biology**

Curriculum-vitae
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PROFESSIONAL EXPERIENCES

- 2024-now **Research associate**
Dr Marc Ouellette's Laboratory, the Infectious Disease Research Center (CRI), University Hospital of Quebec - Laval University Research Center (CHUL), Quebec, Canada
- 2020-2024 **Postdoctoral fellowship** "Functional genomics of antimicrobial resistance in *Streptococcus pneumoniae*"
Dr Marc Ouellette's Laboratory
Highlights: Identified and validated genetic determinants of trimethoprim (TMP) resistance in *S. pneumoniae*; developed machine learning models to predict TMP minimum inhibitory concentrations (MICs)
- Genomics: Conducted genome-wide association studies (GWAS), comparative genomic, and phylogenomic analyses
 - Bioinformatics: Designed and implemented pipelines for genomic and metagenomic analyses, as well as machine learning workflows, using high-performance computing (HPC) infrastructure
 - Functional study: Reconstructed antimicrobial resistance by whole-genome or targeted transformation coupled with sequencing (NGS, Sanger)
- 2015-2018 **Ph.D. in Microbial ecology** "Comparative genomic analysis of *Brevibacterium* strains and study of their biotic interactions with *Hafnia alvei* in a model cheese" – **BreviCheese project**
Food Process Engineering and Microbiology Unit (GMPA), AgroParisTech – INRA, France
Highlights: Identified genetic determinants involved in the growth of *Brevibacterium* on the cheese surface; demonstrated a mutualistic interaction between *B. aurantiacum* and *H. alvei* in cheese
- Genomics: Conducted phylogenetic and orthology analyses, and reconstructed metabolic pathways from genomic data
 - Functional study: Developed a lab-scale mini-cheese model and optimized RNA extraction protocol from cheese; performed microbial, biochemical, transcriptomic (RNA-seq), and metabolomic (LC-MS, HPLC) analyses
- 2015 **Master internship in Microbial ecology** "Comparative genomics of technologically relevant metabolic pathways in *Brevibacterium* and their role in adaptation to the cheese environment", **GMPA**
Highlights: Reconstructed amino acid catabolism pathways across the 20 *Brevibacterium* genomes; investigated the impact of methionine on growth and sulfur metabolism regulation in cheese associated strains
- Microbiology: Cultured *Brevibacterium* and conducted microplate growth assays
 - Genomics: Performed genome sequencing, *de novo* assembly and functional annotation
 - Molecular biology: Extracted and purified DNA and RNA; performed PCR, qPCR, and RT-qPCR
- 2013-2014 **Research assistant, Department of Pharmaceutical Industry, Hanoi University of Pharmacy (HUP),** Vietnam
- Participated in projects on probiotic protection *via* encapsulation and lyophilization, and on magnesium lactate production through microbial fermentation
 - Supervised and monitored student practical work on ethanol production by *Saccharomyces cerevisiae* using a continuous fermentation system
- 2012-2013 **Undergraduate internship** "Bacteriocin production capacity of *Lactobacillus acidophilus* ATCC 4653", **HUP**
- Microbiology: Cultured lactic acid bacteria and extracted, purified, and characterized the bacteriocin produced by *L. acidophilus* ATCC 4653

EDUCATION

- 2015-2018 **Ph.D. speciality Process Engineering, Microbiology**
AgroParisTech, Paris-Saclay University, France
- 2014-2015 **Master mention Molecular and cellular biology speciality Microbiology**
Pierre and Marie Curie University (UPMC, Paris VI), France

Thank you for your attention!

LANGUAGE AND COMPUTER SKILLS

Bioinformatics	High-performance computing (HPC); Database and Analysis platforms (e.g. IMG/M, Galaxy, NCBI, EMBL-EBI, BV-BRC); Programming languages: Bash, Python, R; Machine Learning frameworks: scikit-learn
IT	OS: Unix, Linux, Windows, macOS; Microsoft Office Suite (Word, Excel, PowerPoint); Bibliographic management: Zotero; Version control: Git
Languages	French, English, Vietnamese

PUBLICATIONS

Abdallah, K., Fliss, O., Pham, N. P., Guay, L. D., Gingras, H., Godin, C., Leprohon, P., Biron, E., Fliss, I. & Ouellette, M. (2025). Antimicrobial Activity of a Synthetic Brevibacillin Analog Against Multidrug-Resistant *Campylobacter* spp. *International journal of molecular sciences*, 26(10), 4657. [Article](#).

Peillard-Fiorente, F., Pham, N. P., Gingras, H., Godin, C., Feng, J., Leprohon, P., & Ouellette, M. (2025). Point mutations in functionally diverse genes are associated with increased natural DNA transformation in multidrug resistant *Streptococcus pneumoniae*. *Nucleic acids research*, 53(1), gkae1140. [Article](#).

Pham, N.P., Gingras, H., Godin, C., Feng, J., Groppi, A., Nikolski, M., Leprohon, P., & Ouellette, M., (2024). Holistic understanding of trimethoprim resistance in *Streptococcus pneumoniae* using an integrative approach of genome-wide association study, resistance reconstruction, and machine learning. *MBio*, 15(9), pp.e01360-24. [Article](#).

Telhig, S., Pham, N. P., Ben Said, L., Rebuffat, S., Ouellette, M., Zirah, S., & Fliss, I. (2024). Exploring the genetic basis of natural resistance to microcins. *Microbial Genomics*, 10(2), 001156. [Article](#).

Pham, N.P., Patron, K., Gingras, H., Feng, J., Leprohon, P., & Ouellette, M., (2024). Déchiffrer la résistance au triméthoprime chez *Streptococcus pneumoniae* par une approche intégrative d'étude d'association pangénomique, de reconstruction de la résistance et d'apprentissage automatique. *4e Journée scientifique du Département de Microbiologie, Infectiologie et d'Immunologie, Faculté de Médecine, Université Laval, 2 November 2023, Québec, Canada*. [Poster](#).

Flahaut, M., Leprohon, P., Pham, N. P., Gingras, H., Bourbeau, J., Papadopoulos, B., Maltais, F. & Ouellette, M. (2023). Distinctive features of the oropharyngeal microbiome in Inuit of Nunavik and correlations of mild to moderate bronchial obstruction with dysbiosis. *Scientific Reports*, 13(1), 16622. [Article](#).

Pham, N. P., Landaud, S., Lieben, P., Bonnarne, P., & Monnet, C (2019). Transcription profiling reveals cooperative metabolic interactions in a microbial cheese-ripening community composed of *Debaryomyces hansenii*, *Brevibacterium aurantiacum* and *Hafnia alvei*. *Frontiers in Microbiology*, 10, 1901. [Article](#).

Pham, N. P. (2019). Microbial adaptation in cheese: Tales of *Brevibacterium*. *Paris-Saclay MICROBES day, 27 March 2019, Gif-sur-Yvette, France*. [Speaker](#).

Pham, N. P. (2018). Quels sont les mécanismes d'adaptation de *Brevibacterium* à l'environnement fromager? *Congrès National de la Société Française de Microbiologie, 1-3 October 2018, Paris, France*. [Guest speaker](#).

Pham, N. P., Layec, S., Dugat-Bony, E., Vidal, M., Irlinger, F., & Monnet, C. (2017). Comparative genomic analysis of *Brevibacterium* strains: insights into key genetic determinants involved in adaptation to the cheese habitat. *BMC genomics*, 18(1), 955. [Article](#).

Pham, N. P., Dugat-Bony, E., Vidal, M., Irlinger, F., Monnet, C., & Layec, S. (2017). Comparative genomic analysis of *Brevibacterium* strains: insights into key genetic determinants involved in adaptation to the cheese habitat and generation of functional properties. *The 14th Symposium on Bacterial Genetics and Ecology (BAGECO 14), 4-8 June 2017, Aberdeen, United Kingdom*. [Poster](#).

REFERENCES

Dr. Marc OUELLETTE – Postdoctoral supervisor – **CHUL** – ✉ marc.ouellette@crchudequebec.ulaval.ca – ☎ +1 418-525-4444 # 48184
Dr. Christophe MONNET – Thesis supervisor – **GMPA** – ✉ christophe.monnet@inrae.fr – ☎ +33 01.89.10.11.49
Dr. Eric DUGAT-BONY – Member of thesis committee – **GMPA** – ✉ eric.dugat-bony@inrae.fr – ☎ +33 01.89.10.11.06