

Sophia Ferchiou

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Academic Background

Ph.D. Biology

Laval, Quebec

INRS - Armand-Frappier Research Centre

2019 - 2024

- Research supervisor - Yves St-Pierre (INRS)
- Co-supervisor - Stéphane Betoulle (Université de Reims Champagne-Ardenne)

Title of the project : Using liquid biopsy on marine species to assess marine and coastal ecosystems.

M.Sc. Oceanography

Rimouski, Quebec

Institut des Sciences de la Mer de Rimouski (ISMER)

2016 -2019

- Research supervisor - Jean-Pierre Gagné (ISMER)
- Co-supervisor - Youssef Djibril Soubaneh (UQAR)
- Co-supervisor - Richard Saint-Louis (UQAR)

Title of the project : New chemical approach based on the bioaccumulation of flame retardants to identify and assess the recent diet of the St. Lawrence beluga (*Delphinapterus leucas*).

B.Sc. Biomedical sciences

Montréal, Quebec

Université de Montréal (UdeM)

2013 - 2016

Undergraduate training in Dr. Nadia Shoukry lab

Title of the project : The immune response of different subclones of HCV-specific CD8+ T cells with a limited TCR repertoire.

Professional Experience

Post-doctoral Fellow

Vienna, Austria

University of Vienna - Division of Microbial Ecology (DOME)

2025 - present

Supervisor : Jillian Petersen

Title of the project : Host-microbe interactions in marine invertebrate symbioses – The role of epigenetics and small RNAs

Academic internship

Évry-Courcouronnes, France

Génomscope - Centre National de Séquençage

June-July 2022

Supervisor : Pedro H. Oliveira

- Evaluating and enhancing bioinformatics tools for NGS platforms (ONT and Illumina)
- Opportunity to develop international collaborations

MUSSELKER Research program

Institut polaire Paul-Emile Victor (Mission 72)

Supervisor : Yves St-Pierre

- Using mussels as sentinel species in sub-Antarctic ecosystems for monitoring the health and biodiversity of marine ecosystems in response to climate change
- Field Laboratory: Cell-free DNA extraction and Nanopore sequencing

Kerguelen Islands

Oct-Dec 2021

Engineering and scientific support group (EG-02)

Saguenay–St. Lawrence Marine Park (Parks Canada)

Supervisor : Samuel Turgeon

- Hydroacoustic data analysis of pelagic prey of marine mammals
- Marine mammal observation activities

Tadoussac, Quebec

Feb-Aug 2019

Scholarships

• Ph.D. Studentship

2024	Student scholarship supplement (EcotoQ)
2023-2024	Fonds de recherche du Québec-Nature and technologies (FRQNT)
2022	Globalink FRQNT-Mitacs (declined)
2020	Support program for ecotoxicology studies (EcotoQ)

• M.Sc. Studentship

2017-2018	Fonds de recherche du Québec-Nature and technologies (FRQNT)
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Awards

• Ph.D. Awards

2025	Governor General's of Canada Academic Medal
2025	INRS Executive Office's Award of Excellence
2025	INRS Best Doctoral Thesis Award
2024	Graduate Student Travel Award for International Conferences, EcotoQ
2023	Best Oral Presentation, Armand-Frappier Congress
2023	Public's Choice Award, EcotoQ/ECOBIM Colloquium
2022	Finalist, My Northern Project (Arctic Circle Assembly, Iceland)
2022	Best Oral Presentation, EcotoQ/Chapitre Saint-Laurent
2021	Best Oral Presentation, BiSP Conference

• M.Sc. Awards

2018	Graduate Student Travel Award for International Conferences, IFQM
2018	Student Merit Award, UQAR

Laboratory/technical skills

Research field

- Marine biology
- Programming languages (Python, R, LaTeX)
- Bioinformatics
- Biostatistics
- Biomarkers
- Molecular/Cellular biology research :
 - *Metagenome*
 - *Transcriptome*
 - *Methylome*
 - *Glycome*
 - *Metabolome*

Techniques

- Data analysis and interpretation
- DNA/RNA extraction and purification
- PCR/qPCR/RT-PCR/ddPCR
- Gel electrophoresis
- NGS platforms (ONT, Illumina)
- Fluorescent *in situ* hybridisation (FISH)
- Library preparation
- Troubleshooting and problem-solving

Institutional activities

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| • Mentee - postdoc:muv Mentoring Program
<i>University of Vienna</i> | <i>2025 – present</i> |
| • Member - Student committee
<i>EcotoQ Research Network</i> | <i>2023 – 2024</i> |
| • Student representative - Sustainability committee
INRS Armand-Frappier Health and Biotechnology Centre | <i>2019 – 2023</i> |
| • Mentor - Apprentis chercheurs Program
INRS Armand-Frappier Health and Biotechnology Centre | <i>Summer 2022</i> |
| • Graduate student representative - Research ethics committee
Université du Québec à Rimouski (UQAR) | <i>2017 – 2019</i> |

Peered-reviewed publications

Total : 10 / First author : 6

Vogel MA, Machairas F, Osvatic J, **Ferchiou S**, Hausmann B, Klun K and Petersen JM. (2025). Symbiont diversity within *Loripes orbiculatus* and the case for multiple hosts. (Submitted to *ISME Journal*).

Tornos J, Gamble A, Clessin A, Bralet T, Lejeune M, Connan M, Ryan PG, Weimerskirch H, Gonzalez-Solis J, Catry P, Barbraud C, Delord K, Viblanc VA, Flechet A, Baron J, Caza F, Tounsi A, **Ferchiou S**, Perret S, Bost CA, Steinfurth A, Thiebot JB, Lebouard F, Lesage C, St-Pierre Y, Gantelet H and Boulinier T. (2025). Large-scale exposure of southern seabirds to avian cholera *Pasteurella*

multocida: scavengers as sentinels at different spatial scales (In revision in *Communications Biology*).

Ferchiou S*, Tounsi A, Fronton F, Caza F, Lejeune M, Tornos J, Boulinier T and St-Pierre Y. (2025). Circulating microbiome DNA in Southern Ocean seabirds: A novel tool for disease surveillance in polar ecosystems. *Glob. Ecol. Conserv.* 62. Jg., S. e03774. DOI: [10.1016/j.gecco.2025.e03774](https://doi.org/10.1016/j.gecco.2025.e03774)

Ferchiou S*, Caza F, Sinha K, Sauvageau J and St-Pierre Y. (2024). Assessing marine ecosystem health using multi-omic analysis of blue mussel liquid biopsies: A case study within a national marine park. *Chemosphere*. Aug 1;362:142714. DOI: [10.1016/j.chemosphere.2024.142714](https://doi.org/10.1016/j.chemosphere.2024.142714)

Ferchiou S*, Caza F, Villemur R, Betoulle S and St-Pierre Y. (2023). From shells to sequences: A proof-of-concept study for on-site analysis of hemolymphatic circulating cell-free DNA from sentinel mussels using Nanopore technology. *Sci. Total Environ.* Jul 15;934:172969. DOI: [10.1016/j.scitotenv.2024.172969](https://doi.org/10.1016/j.scitotenv.2024.172969)

Fronton F, **Ferchiou S**, Caza F, Villemur R, Robert D and St-Pierre Y. (2023). Insights into the circulating microbiome of Atlantic and Greenland halibut populations: the role of species-specific and environmental factors. *Sci Rep.* Apr 12;13(1):5971. DOI: [10.1038/s41598-023-32690-6](https://doi.org/10.1038/s41598-023-32690-6)

Ferchiou S*, Caza F, Villemur R, Labonne J and St-Pierre Y. (2023). Skin and Blood Microbial Signatures of Sedentary and Migratory Trout (*Salmo trutta*) of the Kerguelen Islands. *Fishes*. Mar 24;8(4):174. DOI: [10.3390/fishes8040174](https://doi.org/10.3390/fishes8040174)

Ferchiou S*, Caza F, de Boissel PG, Villemur R and St-Pierre Y. (2022). Applying the concept of liquid biopsy to monitor the microbial biodiversity of marine coastal ecosystems. *ISME Comm.* Jul 27;2(1):61. DOI: [10.1038/s43705-022-00145-0](https://doi.org/10.1038/s43705-022-00145-0)

Ferchiou S*, Caza F, Villemur R, Betoulle S and St-Pierre Y. (2022). Species- and site-specific circulating bacterial DNA in Subantarctic sentinel mussels *Aulacomya atra* and *Mytilus platensis*. *Sci Rep.* Jun 10;12(1):9547. DOI: [10.1038/s41598-022-13774-1](https://doi.org/10.1038/s41598-022-13774-1)

Berger CS, Bougas B, Turgeon S, **Ferchiou S**, Ménard N and Bernatchez L. (2020). Groundtruthing of pelagic forage fish detected by hydroacoustics in a whale feeding area using environmental DNA. *Environ. DNA*. Oct;2(4):477-92. DOI: [10.1002/edn3.73](https://doi.org/10.1002/edn3.73)

Non-peered review communications

Total : 4

Ferchiou S, Caza F and St-Pierre Y. (2022). Liquid biopsy in sentinel mussels, *protocols.io*. DOI: [10.17504/protocols.io.81wgb6z9olpk/v2](https://doi.org/10.17504/protocols.io.81wgb6z9olpk/v2)

Ferchiou S, Del Valle C, Betoulle S, Caza F and St-Pierre Y. (2020). Protocol for the extraction and preservation of DNA from mussel hemolymph. *INRS's cinematographic production committee*.
<https://www.youtube.com/watch?v=8DZaBoW3ogQ>

Ferchiou, S, Turgeon, S. (2019). Report on the assessment of pelagic prey biomass in the Saguenay–St. Lawrence Marine Park (SSLMP) using hydroacoustic data. *Technical report for Parks Canada*.

Ferchiou, S, Turgeon, S. (2019). Report on the identification of the main ecological niches of large marine mammals in the Saguenay–St. Lawrence Marine Park (SSLMP) using hydroacoustic data. *Technical report for Parks Canada*.

Oral presentations

Total : 8 / Award-winning: 5 / International: 2

- 11/2023** *Scientific Meeting- Sentinel North*: “From the Arctic to the North Coast: Assessing marine and coastal environments by applying the concept of liquid biopsy in the blue mussel (*Mytilus spp.*)”. Quebec, Qc, Canada
- 11/2023** *Armand-Frappier Conference*: “Use of liquid biopsy in blue mussels (*Mytilus spp.*) to assess the health status of marine and coastal ecosystems”. Saint-Sauveur, Qc, Canada **(Best oral presentation)**
- 06/2023** *Joint colloquium on ecotoxicology (EcotoQ/ECOBIM)*: “Combining the concept of liquid biopsy and a multi-omics approach in blue mussels (*Mytilus spp.*) to assess the health status of coastal marine ecosystems: An application example at the Saguenay-St. Lawrence Marine Park”. Quebec, Qc, Canada **(Public's choice award)**
- 10/2022** Arctic Circle Assembly – My Northern Project: “Using liquid biopsies in sentinel mussels for monitoring biodiversity in marine ecosystems”. Reykjavík, Iceland **(Finalist)**
- 06/2022** *Joint colloquium on ecotoxicology (EcotoQ/ECOBIM)*: “Combining the concept of liquid biopsy in blue mussels and Nanopore® sequencing technology for assessing the impact of climate change and pollution on coastal marine ecosystems.”. Quebec, Qc, Canada **(Best oral presentation)**
- 05/2021** *Bactériologie intégrative: Symbiose – Pathogénèse (BiSP) conference*: “Study of the bacterial microbiome in mussels as an indicator of the health status of marine and coastal ecosystems in polar regions”. Montreal, Qc, Canada **(Best oral presentation)**

presentation)

- 05/2018** *ECOBIM conference: “A model based on persistent contaminants (PBDEs) to identify and assess the main prey within the recent diet of the St. Lawrence beluga”*. Bordeaux, France
- 11/2017** *Annual scientific meeting – Quebec Ocean: “A contaminated diet: a risky puzzle for belugas!”*. Rivière-du-loup, Qc, Canada **(Best oral presentation)**

Poster presentations

Total : 3 / International: 2

- 10/2025** *Trends in Marine Host-Microbe Symbioses Symposium: “Between the shells: Tracking epigenomics and small RNA regulation in a widespread and ancient marine symbiosis”*. Padua, Italy
- 08/2024** *ISME19 Symposium: “Combining liquid biopsy with a multi-omic approach in blue mussels (Mytilus spp.): The next wave in marine ecosystem health diagnostics”*. Cape Town, South Africa
- 06/2023** *INQ's Northern Days : “Use of liquid biopsy in mussels to monitor the biodiversity and health of marine, coastal, and polar ecosystems”*. Trois-Rivières, Qc, Canada