

## Current Position

Postdoctoral Researcher / Lecturer, Common-law partner, 2 children

## RESEARCH THEMES

I use genetic and genomic approaches to address questions in conservation, evolutionary biology and marine ecology. In my area of expertise, I investigated the genetic and phenotypic impacts of management measures on both wild and cultivated populations, identified the introduction pathways of non-native species and the life history traits promoting their establishment success, and explored the utility of metagenomics in studying the dynamics of benthopelagic communities.

## EDUCATION

**2005~2009:** Ph.D. completed Pierre and Marie Curie University, Paris VI.

Supervisor: Frédérique Viard (Lab. Diversity and Connectivity in marine coastal landscape, UMR7144)

***Gregarious behavior, sex change, and polyandry in an invasive species, *Crepidula fornicata****

**2004~2005:** Master's Degree in Biodiversity, Paleontology, and Biological Oceanography at University Lille I, France

Advisor: Castric, V. and Vekemans, X. (Lab. Genetics and Evolution of Plant Populations, UMR8198)

***Genetic variability at the self-incompatibility locus in *Arabidopsis halleri****

**2003~2004:** MSc in Marine Population Biology and Ecosystems, Université de Bretagne Occidentale, France

**2002~2003:** BSc in Population Biology, Université de Bretagne Occidentale, France

## RESEARCH ACTIVITIES

Feb 2024-July 2024 : **Postdoctoral researcher** - MITACS Fellowship

In collaboration with France Dufresne (University of Québec at Rimouski)

***Genetic diversity of the kelp *Laminaria latissima* in the Saint Lawrence Gulf***

Nov 2022-Feb 2024 : **Postdoctoral researcher** - IFQM Fellowship

In collaboration with Pierre Blier (University of Québec at Rimouski)

***Study of mitochondrial phenotypes of different evolutionary lineages of *Macoma balthica****

Sept 2020-Oct 2022: **Postdoctoral researcher** - ANR DRIVE project

In collaboration with Eric Pante (LIENSs, CNRS, University of La Rochelle)

***The role of mitochondrial transmission mode (DUI - doubly uniparental inheritance) in the evolution of *Macoma balthica* populations***

**Aout 2017- Sept 2020** : CAREER BREAK (maternity leaves)

Aug 2015~Jul 2017 : **Postdoctoral researcher** () ANR GenopopTaille project

In collaboration with Gregory Charrier (Lemar, IUEM, UBO Brest) and Sylvie Lapègue (LGPM, Ifremer La tremblade)

***Phylogeography of the Thornback Ray (*Raja clavata*) and absolute size estimation using CKMR (Close-Kin Mark-Recapture) method***

Jun 2014~Aug 2015 : **Postdoctoral researcher** - Eranet INVASIVES project

In collaboration with Frédérique Viard (Lab. DivCo, UMR7144)

***Study of the global invasion of the brown algae *Sargassum muticum****

Dec 2013~May 2014 : **Postdoctoral researcher** - Marinexus project

In collaboration with Thierry Comtet (Lab. Diversity and Connectivity in marine coastal landscape, UMR7144)

***Temporal evolution of meroplankton diversity using metabarcoding approach.***

## **Jan-Nov 2012:** CAREER BREAK

Oct 2009~Dec 2012 : **Postdoctoral researcher** - European AARC program/Plan Loire

In collaboration with Guillaume Evanno (Lab. Conservation and Restoration of Aquatic Ecosystemes), UMR 0985)

**Conservation genetics of wild salmon: genetic and phenotypic consequences of river restocking measures.**

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## **RESEARCH FUNDING AND GRANTS**

**2023** Travel grant for international collaboration by the RAQ (Réseau Aquaculture Québec) (\$2,000 CAD)

**2021** Grant Application for 1 year Post-doctoral project in the French-Québec Maritime Institute Project: Evolutionary Eco-physiology of Bivalves in Marine Environments: Stress and Thermal Adaptation (\$50,000 CAD)

**2011** Research funding INRAE Innovative Project "SatSex" Funding (€10,000)

**2010** Grant Application for a 2-years Postdoctoral Position in the PLAN LOIRE 2007-2013 Project: Genetic Diversity Analysis of Atlantic Salmon in the Allier Basin: Origin of Spawners (Wild/Cultivated) and Spatial-Temporal Structuring. Funding provided by FEDER, Water Agency, Loire Public Establishment (€126,000)

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## **AWARDS**

**2010** Best Poster Award at SEB (Society for Experimental Biology) Conference: "Intra-Specific Diversity in Aquatic Animals," Sète, France (100€)

**2008** ASAP Travel Grant: Workshop "Analogies in the Evolution of Gender Expression and Sexual Strategies in Animals and Plants," Germany (€500)

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## **SCIENTIFIC PUBLICATIONS**

**Le Cam S., Brémaud J., Becquet V., Huet V., Garcia P., Viricel A., Breton S., Pante E.** Discordant population structure inferred from male- and female-type mtDNAs from *Limecola balthica*, a bivalve species characterized by doubly uniparental inheritance of mitochondria bioRxiv (<https://doi.org/10.1101/2022.02.28.479517>) under revision to *PCI EvolBiol*

**Le Cam S., Brémaud J., Malkócs T., Kreckelbergh E., Becquet V., Dubillot E., Garcia P., Breton S., Pante E. (2023)** LAMP-based molecular sexing in gonochoric marine bivalves with divergent sex-specific mitochondrial genomes *Ecology and Evolution* 13.8 (2023): e10320.

**Marandel F., Charrier G., Lamy J.B., Le Cam S., Lorance P. & Trenkel V.M. (2020)** Estimating effective population size using RADseq: Effects of SNP selection and sample size. *Ecology and Evolution* 10(4), 1929.

**Le Cam S., Daguin-Thiébaud C., Bouchemousse S., Engelen A.H., Mieszkowska N. & Viard F. (2019)** A genome-wide investigation of the worldwide invader *Sargassum muticum* shows high success albeit (almost) no genetic diversity. *Evolutionary Applications* 13, 500– 514.

**Couton M., Comtet T., Le Cam S., Corre E. & Viard F. (2019)** Metabarcoding on planktonic larval stages: an efficient approach for detecting and investigating life cycle dynamics of benthic aliens. *Management of Biological Invasions*, 10(4), 657-689

**Marandel F., Lorance P., Andrello M., Charrier G., Le Cam S., Lehuta S., Trenkel V.M. (2018)** Insights from genetic and demographic connectivity for the management of rays and skates. *Canadian Journal of Fisheries and Aquatic Sciences*, (75), 1291-1302.

**Côte J., Roussel J. M., Le Cam S., Guillaume F. & Evanno G. (2016).** Adaptive divergence in embryonic thermal plasticity among Atlantic salmon populations. *Journal of evolutionary biology*, (8), 1593-601.

**Riquet F., Le Cam S., Fonteneau E. & Viard F. (2016)** Moderate genetic drift is driven by extreme recruitment events in the invasive mollusk *Crepidula fornicata*. *Heredity*, 117(1), 42-50.

**Le Cam S., Perrier C., Besnard A. L., Bernatchez L. & Evanno G. (2015).** Genetic and phenotypic changes in an Atlantic salmon population supplemented with non-local individuals: a longitudinal study over 21 years. *Proceedings of the Royal Society of London B: Biological Sciences*, 282(1802), 20142765.

**Côte J., Roussel J. M., Le Cam S., & Evanno G. (2014).** Outbreeding depression in Atlantic salmon revealed by hypoxic stress during embryonic development. **Evolutionary Biology**, 41(4), 561-571.

**Le Cam S., Riquet F., Pechenik J. A., & Viard F. (2014).** Paternity and Gregariousness in the Sex-Changing Sessile Marine Gastropod *Crepidula convexa*: Comparison with Other Protandrous *Crepidula* Species. **Journal of Heredity**, 105(3), 397-406.

**Côte J., Roussel J-M., Le Cam S., Bal G. & Evanno G.(2012).** Population differences in response to hypoxic stress in Atlantic salmon. **Journal of Evolutionary Biology**, 25: 2596–2606.

**Le Cam S. & Viard F. (2011).** Infestation of the invasive mollusc *Crepidula fornicata* by the native shell-borer *Cliona celata*: high parasite load without detrimental effects, **Biological Invasions** Special Issue “Biological Invasions and Ecosystem Functioning”, 13: 1087-1098.

**Le Cam S., Cagnon M., Pechenik J. & Viard F. (2009).** Fast vs. slow larval growth in an invasive marine mollusc: does paternity matter? **Journal of Heredity**, 100: 455-464.

**Daguin-Thiébaud C., Le Cam S. & Viard, F. (2009).** Isolation of eleven microsatellite markers in the gastropod *Crepidula convexa* (Gastropod, Calyptraeidae) for parentage analysis. **Molecular Ecology Resources**, 9: 917- 920.

### Dataset

Le Cam S et al. (2019). SNPs for thornback ray *Raja clavata*, validated from genotyped individuals. SEANOE. <https://doi.org/10.17882/70546>

Le Cam S., et al. (2019). RADSeq-derived SNP genotypes for 159 thornback ray *Raja clavata* from the Bay of Biscay. SEANOE. <https://doi.org/10.17882/70648>

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## SCIENTIFIC COMMUNICATIONS

### Oral presentations as first author

#### **International marine connectivity conference, Paris (2021) à venir**

Genetic connectivity inferred from male- and female-type mitochondrial DNA from *Limecola balthica*, a bivalve species characterized by DUI

*Le Cam S., Brémaud J., Becquet V., Garcia P., Viricel A. & Pante E.*

#### **International marine connectivity conference, St Andrews, UK (2016)**

Genetic diversity of the Thornback ray (*Raja clavata*) in the North East Atlantic assessed by RAD sequencing.

*Le Cam S., Cornette F., Charrier G., et al.*

#### **6th European Phycological Congress Londres, UK (2015)**

Elucidating unresolved invasion history with genome-wide sequencing approach: the case of the global invader *Sargassum muticum*.

*Le Cam S., Daguin-Thiébaud C., Bouchemousse S. & Viard F.*

#### **Génomique Environnementale 2015, Montpellier (2015)**

La génomique des populations peut-elle nous aider à élucider l’histoire d’introduction de l’algue *Sargassum muticum* ?

*Le Cam S., Daguin-Thiébaud C., Bouchemousse S. & Viard F.*

#### **Ottawa Evolution: First Joint Congress on Evolutionary Biology, Ottawa, Canada (2012)**

35 years of evolution of neutral and adaptive genetic diversity in an Atlantic salmon population,

*Le Cam S., Ducret V, Galan M. & Evanno G.*

#### **Ecologie 2010, Montpellier (2010)**

Le changement de sexe est-il sous l’influence du recrutement chez le gastéropode protandre invasif *Crepidula fornicata* ? *Le Cam S. & Viard F.*

#### **Groupe de Biologie et Génétique des Populations, Rennes (2008)**

Growing fast or not? Is it all about dads in larvae of the gastropod *C. fornicata*?

*Le Cam S., Cagnon M., Pechenik J. A. & Viard F.*

#### **Invasions biologiques, 11e rencontres francophones, Rennes (2007)**

Relations entre dynamique de population et changement de sexe chez le gastéropode protandre invasif *C. fornicata*.

*Le Cam S., Viard F.*

#### **EMPSEB12, Saint Andrews, Ecosse (2006)**

Relationships between population and sex change dynamics in the protandrous gastropod *C. fornicata*.

Le Cam S, Dupont L, Comtet T, Viard F

**ESEB, Cracovie, Pologne (2005)**

Evolution under strong frequency-dependent selection: population genetic structure of the self-incompatibility locus in *Arabidopsis*.  
*C Castric V., Le Cam S., Vekemans X.*

**GBGP, Bordeaux (2005)**

Study of the geographical structure of the genetic variation at the Self incompatibility Locus in European populations of *Arabidopsis halleri*.  
*Le Cam S., Castric V., Vekemans X.*

### Posters as first author

**International marine connectivity conference, Paris (2021) à venir**

Mito-nuclear coadaptation in bivalves with doubly uniparental inheritance of mitochondria may rely on alternative splicing  
*Sabrina Le Cam, Valentine Watteau, Eric Pante.*

**Invasion Genetics: The Baker and Stebbins Legacy Symposium Asilomar, US (2014)**

(Poster) Linking neutral genetic diversity and invasive success: a time for reappraisal? From microsatellites to genome-wide approaches in the invasive seaweed *Sargassum muticum*.

*Frédérique Viard, Sarah Bouchemousse, Sabrina Le Cam, Aschwin H. Engelen, Nova Mieszkowska, Claire Daguin-Thiébaud.*

**SEB: Intra Specific Diversity in Aquatic Animals, Sètes, France (2010)** (Prix du meilleur poster)

Neutral and adaptive genetic variation in Atlantic salmon populations,

*Perrier C., Le Cam S., Baglinière J.L., Guyomard R., & Evanno G.*

**EGG: Ecological Genetics Group, Londres, Angleterre (2011)**

Variations in neutral and adaptive genetic diversity in an endangered Atlantic salmon population,

*Le Cam S & Evanno G.*

**BIOLIEF: World conference on Biological Invasions and Ecosystem Functioning, Porto, Portugal (2009)**

Can invasive populations of *C. fornicata* be a reservoir of the harmful cryptogenic boring sponge *Cliona celata*?

*Le Cam S. & Viard F.*

**ASAP: Workshop "Analogies in the evolution of gender expression and Sexual strategies in Animal and Plant", Allemagne (2008)**

Invitée à participer et obtention d'une bourse de voyage.

**ESEB, Uppsala, Suède (2007)**

Massive recruitment event and epifauna attacks: Do they influence sex change in the protandrous mollusc, *C. fornicata*?

*Le Cam S. & Viard F.*

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## COMPETENCES and TRAININGS

### Bioinformatics

Programming in \*NIX environments (BASH, Python, R)

Utilization of computing clusters for massive parallel computations

Data Types: Sanger, Long-Reads, SNP, RADseq, RNAseq, Metabarcoding

**2017 (5d) Bioinformatics:** Advanced python for biologists. Edinburgh Genomics

**2014 (5d) Bioinformatics:** The third metabarcoding spring school 2014. P. Taberlet & E. Coissac

**2014 (5d) Bioinformatics:** Advanced linux training: scripting, cluster, galaxy (ABIMS, Roscoff)

### Genomic and Transcriptomic Analysis

Population Genetics, Parentage/Pedigree Analysis, Genome Scan, Comparative Genomics

*de novo* Transcriptome Assembly, Annotation, and Differential Expression Analysis

### Biostatistics and Numerical Ecology

Modeling, multivariate analysis (GLM, GAM, GLMM)

Factorial Analyses and Bayesian Approaches

**2011 (5d) Statistics:** Data exploration, regression, GLM and GAM with R. Dr A. Zuur & Dr. E. Ieno

**2008 (5d) Numerical Ecology:** New methods in spatial ecology. P. Legendre (U. Montréal)

### Field and Experimental Biology

Temporal Population Monitoring, Planktonic Sampling for eDNA

Maintenance in Breeding, Spawning Induction, and Crossbreeding in Salmon and Baltic Tellin

Factorial Crossbreeding, "Common Garden" Experiments (T°C, O<sub>2</sub>)

### Molecular Biology

Strong experience in basic laboratory techniques

Construction of enriched libraries for high-throughput sequencing (RADseq, RNAseq, Amplicons) on different technologies (Illumina, Oxford Nanopore Minion)

**2006 (15d)** Biodiversity analysis and life history strategies. Marine Genomics

**2005 (5d)** Molecular ecology and population genetics of marine organisms. Master2 UPMC EBE

### Project management

**2019 (3 month) Agile Project Manager**, APEC Certified Training

**Languages: English (Fluent), Spanish (Basics), French (Native language)**

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### **TEACHING and MENTORING**

Teaching, Supervision, and technical training of interns and laboratory technicians

**2023** Lecturer for 2 courses in University of Québec at Rimouski (45h per course)

Bachelor level Integrative and evolutionary physiology

Master level Conservation genetics

### **In French universities ;**

Year	Theme	Level	Time
2007 2008	Practical Work/Tutorial on the study of sequential hermaphroditism	Master 2 EBE, UPMC	8h
2009	Practical Work/Tutorial on Population dynamics study	Master 2 OEM, UPMC	4h
2010	Practical Work/Tutorial on Demographic and sexual population dynamics	Master 2 OEM, UPMC	12h
2011	Course / Tutorial in professional training: Introduction to population genetics	Niveau AI et IE	7h
2014	Practical Work/Tutorial Barcoding Practical Work/Tutorial Biogeography et phylogeography	Master 2 EBE UPMC	9h
2014	Tutorial Species identification and delineation	Master 2 OEM UPMC	3h
2015	Course/Practical Work/Tutorial Food Traceability:	Bachelor	25h
2021 2022	Oral Evaluation: Cross-Disciplinary Teaching in Scientific Methodology	Bachelor	15h

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