

Post-Doc in Aquatic Ecotoxicology, *Microplastics toxicity*



CORMIER Bettie

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Keywords

Microplastics (MPs)
Aquatic Ecotoxicology
Zebrafish
Embryo-larval assay
Long-term toxicity

Languages

Mother tongue
 Fluent
(spoken/written/read)

Computer skills

- GraphPad
- MassLynx
- Microsoft office
- R software
- Visual Basic
- SymyxDraw/Spartan

Personal Grant

- **Idex: Excellence Initiative of Bordeaux University**
PhD: International Doctorate
- **European doctorate label**

Current position

2021 **Post Doc, ARPlastic project**
UMR CNRS 5805 EPOC EA, Bordeaux University (FR)
Microplastic contamination in seafood (Arcachon Bay, France); Study of health risk

Education and training

2020 **PhD in Ecotoxicology, European doctorale label**
Bordeaux University (FR)/Örebro University (SE) « *Microplastics toxicity for zebrafish: beyond simple vectors of pollutants ?* »

2019 **Licentiate in Biology (swedish degree, 120 ECTS)**
Örebro University (SE)
« *Investigation of the chemical and ecotoxicological behaviour of polyethylene microplastics using different bioreporter test sytems* »

2016 **Master degree in Ecotoxicology and Environmental Chemistry**
Laureate with honours (rank 2/28), Bordeaux University (FR)

2014 **Bachelor degree in Environmental Chemistry**
With honours (rank: 2/18) Angers University (FR)

2013 **DUT Chemistry** (Technology degree)
IUT (University Institute of Technology) Le Mans (FR)

2011 **Baccalaureate Science, with honours**, Le Mans (FR)

Work experience

2021-Now **Post Doc, ARPlastic project** (UMR CNRS 5805 EPOC EA, Bordeaux, FR)

2016-2020 **PhD in Aquatic ecotoxicology, EPHEMARE project** (UMR CNRS 5805 EPOC EA, Bordeaux (FR)/MTM, Örebro University (SE))

2017
(2 months) **International mobility**, RWTH Aachen University (DE)
• *Mutagenicity of MPs extracts (Ames test)*

2016
(6 months) **Master Internship**, 2nd year (UMR CNRS 5805 EPOC EA, Bordeaux, FR)
« *Toxicity of vineyard pesticides on ELS (rainbow trout) and RTL-W1* »

2015
(3 months) **Master Internship**, 1st year (UMR CNRS 5805 EPOC LPTC, Bordeaux, FR)
« *Polar compounds in waste water under photodegradation* »

2014
(1 month) **Bachelor Internship** (Suez Environment, Angers, FR)
« *Waste water treatment: analysis of water and sludge for zoning ATEX installations* »

2013-2014
(4 months) **Laboratory technician** (SOTREMO-SARPI Veolia, Le Mans, FR)
• *Analysis of heavy metals in industrial waste water*

2013
(3 months) **Internship**, technician (Drinking water station, Le Mans, FR)
« *Installation and calibration of automatic water quality analyzers* »

Scientific References

- **Jérôme Cachot, Professor**
PhD thesis director
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- **Steffen H. Keiter, Associate Professor**
PhD thesis director
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Ecotoxicology

- *In vitro* biotest system: Comet Assay, Neutral Red Assay, ER-CALUX assay, EROD Assay, ROS Assay, Ames Assay, SOS Chromotest, Microtox assay
- Early life stages embryo and larval exposure (*Danio rerio*; *Oncorhynchus mykiss*; *Oryzias melastigma*); OECD n°236, survival, growth, behaviour (LPMR), genotoxicity, EROD activity
- Cell culturing: RTL-W1, ZFL, T47D-Kbluc
- *In-vivo* exposure: fish rearing, survival/growth, genotoxicity, behaviour, reprotoxicity

Chemistry

- Quantification and characterization (FTIR-ATR) of MPs (water, sediment, aquatic organism)
- MPs preparation (artificial sorption and/or extraction of chemicals; cryogrinding; granulometry)
- Artificial digestion of MPs
- Analytical chemistry (HPLC/UPLC-MS/MS; GC-MS/MS; ICP-MS)
- POCIS (preparation/extraction/analysis)
- Sediment/water sampling and extraction (Soxhlet; SPE; SPME; leachates)

Scientific communication

- Writing of scientific articles
- Oral communication (international conferences, workshop, lecture for general public)

Scientific co-manager of WP1 in European project (EPHEMARE)

Reviewer for scientific journals (STOTEN; ESPR; ES&T)

Evaluation of scientific application project

- Call for Junior and Senior Research Projects of the Research Foundation Flanders (FWO)
- National Research Programme for Environmental and Occupational Health (ANSES)

Field sampling (Microplastics)

- RESPONSE project, water filtration on 300 µm and 10 µm, Arcachon Bay (FR), 2021
- Race For Water Odyssey 2017-2021, Guadeloupe (FR) 2018: Manta trawl; Niskin bottle, sediment sampling (Van Veen grab sediment sampler); beach sampling (NOAA protocol)
- Beach sampling (NOAA protocol) in Gotska Sandön National Park (SE), 2017

Other Professional Qualification

European doctorate Certificate, 2020: mobility Sweden: 24 months

Animal Experimentation – Former Level 1, 2018 (*Marseille, FR*) Design of experimental procedures and projects on aquaculture models: Maintenance of zebrafish rearing and breeding

Teaching, Bachelor's degree in Chemistry-Ecotoxicology

- Lecture: Aquatic Ecotoxicology
- Seminar: Aquatic Ecotoxicology
- Practical work: Aquatic Ecotoxicology / Analytical Chemistry

Research training, 4 MSc students + 3 mentored scholarly projects

Member of the organizing committee

- International scientific conference (ECOBIM 2018)
- DS Doctoral Students Day (JDED 2018)

Membership in scientific association

- ECOBIM (International research consortium)
- GDR Ecotoxicologie Aquatique (National research consortium)
- GDR Polymères et Océans (National research consortium)

Scientific jury for IMPACT (International Microplastics Photo Contest) 2017 within EPHEMARE project

List of workshops, stakeholder meeting

- **ECHA Stakeholder Workshop on Microplastic**, Helsinki, Finland (2018): **Knowledge gaps for the ecotoxicological assessment and modelling of microplastics in the sea – Conclusions of the EPHEMARE project.** Keiter S.H., Albentosa M., Avio C.G., Batel A., Bebianno M., Begout M.-L., Beiras R., Bellas J., Blust R., Braunbeck T., Cachot J., Carteny C.C., Cormier B., Cousin X., Cuesta A., Faimali M., Garaventa F., Gorbi S., Guilhermino L., Hylland K., Kopke K., Morin B., Pittura L., Regoli F., Town R.
- **Renare Mark Symposium**, Östersund, Sweden (2017): **EU-projektet EPHEMARE- ekotoxikologiska effekter av mikroplaster i marina ekosystem.** Keiter S.H., Albentosa M., Avio C.G., Batel A., Bebianno M., Begout M.-L., Beiras R., Bellas J., Blust R., Braunbeck T., Cachot J., Carteny C.C., Cormier B., Cousin X., Cuesta A., Faimali M., Garaventa F., Gorbi S., Guilhermino L., Hylland K., Kopke K., Morin B., Pittura L., Regoli F., Town R.
- **2nd EPHEMARE Meeting report**, Genoa, Italy (2017): **WP1: Adsorption and equilibrium partition of persistent pollutants to microplastics (MPs).** Cormier B., Larsson M., Engwall M., Keiter S.H.
- **Seminar for the Swedish King Carl XVI Gustaf**, Örebro, Sweden (2017): **Microplastic in the Baltic Sea – a small problem with big consequences.** Kärman A., Keiter S.H., Engwall M., Cormier B., Rotander A.

List of public conferences, Scientific popularization

- **4P Shore and Seas, Public Conference on Microplastics (Sciences Café)**, Anglet, France (2021): **Ecotoxicological effects of microplastics on aquatic organisms, scientific review.** Cormier B.
- **Carrefour des Sciences et des Arts, Public Conference on Microplastics (Cultivate your Sciences)**, Cahors, France (2021). **Plastics are fantastic, but what do aquatic organisms think?** Cormier B.
- **DECLICS 2017**, Bordeaux France (2017): **Scientific popularization for high school students,** Cormier B.

Voluntary experiences

Volunteer « Carrefour des Sciences et des Arts », Scientific popularization association, Cahors, FR (2020-2021)

- Involved in the design/development/organization of « Jeux de Sciences » project
- Involved in the organization of « PopCulture » project

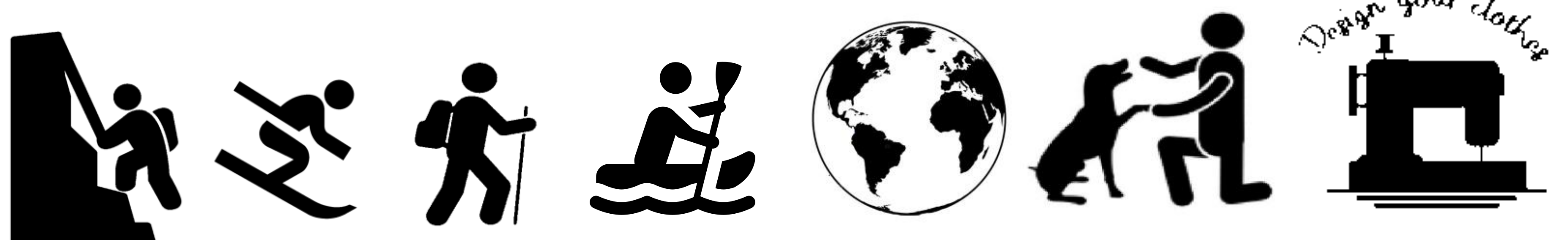
Volunteer « Restos du Cœur », Charity offering free food, Prayssac, FR (2020-2021)

- Food management, distribution of food packages
- Setting up « Christmas for everyone » with individuals gifts (collect; preparation and distribution)

Volunteer « Soie Rouge », non-profit organization fighting to end period poverty, Paris, FR (2021)

- Sewing of washable sanitary towels for homeless woman

Hobbies



2021

- Cormier B., et al (2021) **Chemicals sorbed to environmental microplastics are toxic to early life stages of aquatic organisms**. Ecotoxicol Environ Saf. <https://doi.org/10.1016/j.ecoenv.2020.111665>
- Cormier B., et al (2021) **Chronic feeding exposure to virgin and spiked microplastics disrupts essential biological functions in teleost fish**. J Hazard Mater. <https://doi.org/10.1016/j.jhazmat.2021.125626>
- Weeks et al (2021) **Environmentally Relevant Mixture of Pesticides Affect Mobility and DNA Integrity of Early Life Stages of Rainbow Trout (*Oncorhynchus mykiss*)**. Toxics. <https://doi.org/10.3390/toxics9080174>

2020

- Batel A., et al (2020) **Histological, enzymatic and chemical analyses of the potential effects of differently sized microplastic particles upon long-term ingestion in zebrafish (*Danio rerio*)**. Mar Pollut Bull 153:111022. <https://doi.org/10.1016/j.marpolbul.2020.111022>
- Blanc M., et al (2020) **Multi- and transgenerational effects following early-life exposure of zebrafish to permethrin and coumarin 47: Impact on growth, fertility, behavior and lipid metabolism**. Ecotoxicol Environ Saf. <https://doi.org/10.1016/j.ecoenv.2020.111348>
- Le Bihanic F., et al (2020) **Organic contaminants sorbed to microplastics affect marine medaka fish early life stages development**. Mar Pollut Bull. <https://doi.org/10.1016/j.marpolbul.2020.111059>
- O'Donovan S., et al (2020) **Effects of the UV filter, oxybenzone, adsorbed to microplastics in the clam *Scrobicularia plana***. Sci Total Environ. <https://doi.org/10.1016/j.scitotenv.2020.139102>
- Regoli F., et al (2020) **Insights on Ecotoxicological Effects of Microplastics in Marine Ecosystems: The EPHEMARE Project**. Springer, Cham, pp 12–19

2019

- Cormier B., et al (2019) **Multi-Laboratory Hazard Assessment of Contaminated Microplastic Particles by Means of Enhanced Fish Embryo Test With the Zebrafish (*Danio rerio*)**. Front Environ Sci. <https://doi.org/10.3389/fenvs.2019.00135>
- Weeks Santos S., et al (2019) **A glyphosate-based herbicide induces sub-lethal effects in early life stages and liver cell line of rainbow trout, *Oncorhynchus mykiss***. Aquat Toxicol. <https://doi.org/10.1016/j.aquatox.2019.105291>

2018

- Beiras R., et al (2018) **Ingestion and contact with polyethylene microplastics does not cause acute toxicity on marine zooplankton**. J Hazard Mater. <https://doi.org/10.1016/j.jhazmat.2018.07.101>
- O'Donovan S., et al (2018) **Ecotoxicological effects of chemical contaminants adsorbed to microplastics in the Clam *Scrobicularia plana***. Front Mar Sci. <https://doi.org/10.3389/fmars.2018.00143>
- Pittura L., et al (2018) **Microplastics as Vehicles of Environmental PAHs to Marine Organisms: Combined Chemical and Physical Hazards to the Mediterranean Mussels, *Mytilus galloprovincialis***. Front Mar Sci. <https://doi.org/10.3389/fmars.2018.00103>

In prep.

- Cormier B., et al (2021) **Chronic exposure to environmental microplastics reduce growth and reproduction efficiency in F0 and F1 survival in teleost fish: *Danio rerio* and *Oryzias melastigma***
- Cormier B., et al (2021) **Plastic contamination of edible parts of marine organism in the North Atlantic French coast**
- Cormier B., et al (2021) **Chemicals from environmental aged plastics are toxic to human cells**

List of poster presentation

- ECOBIM, Bordeaux, France (2018): **EPHEMARE : Méthodologie pour étudier les effets toxiques de microplastiques, en tant que vecteur de polluants, en utilisant les poissons modèles : poisson zèbre (*Danio rerio*) et médaka marin (*Oryzias melastigma*)**. Cormier B., Le Bihanic F., Keiter S.H., Engwall M., Larsson M., Yeung L., Clerandeanu C., Crebassa J.-C., Morin B., Bégout M.-L., Cousin X., Cachot J.
- Polymères et Océans, Montpellier, France (2018): **Toxic effects of industrial primary microplastics, spiked with model pollutants, using zebrafish (*Danio rerio*)**. Cormier B., Larsson M., Yeung L., Clérendeanu C., Kärrman A., Morin B., Engwall M., Bégout M.-L., Cousin X., Keiter S.H., Cachot J.

List of platform presentations (Speaker)

- **ECOBIM, Online (2021): Toxicological effects of environmental microplastics, using a chronic exposure with two teleost fish.** Cormier B., Le Bihanic F., Blanc M., Cabar M., Clérandeau C., Keiter S.H., Lemoine S., Morin B., Van Arkel K., Zapata S., Bégout M.L., Cachot J., Cousin X.
- **ECOBIM, Online (2021): Contamination des ressources halieutiques par les microplastiques et étude de l'exposition : cas de la Baie d'Arcachon (côte française de l'Atlantique Nord).** Cormier B., Le Bihanic F., Lefebvre C., Lecomte S., Cachot J., Morin B.
- **YES SETAC, Ghent, Belgium (2019): Toxicological effects in different stages of zebrafish after direct and trophic exposures to microplastics collected from two Guadeloupe beaches.** Cormier B., Cabar M., Zapata S., Lagarde F., Morin B., Dubocq F., Clérandeau C., Keiter S.H., Bégout M.-L., Cachot J., Cousin X.
- **MICRO, Lanzarote, Spain (2018): Toxicity assessment of microplastics using early life stage of zebrafish (*Danio rerio*) and marine medaka (*Oryzias melastigma*).** Cormier B., Le Bihanic F., Zapata S., Keiter S.H., Bégout M.-L., Cousin X., Cachot J.
- **MICRO, Lanzarote, Spain (2018): Sorption and bioavailability of model pollutants on microplastics.** Cormier B., Borchert F., Hylland K., Kärrmann A., Larsson M., Yeung L., Engwall M., Keiter S.H.
- **SETAC Europe, Rome, Italy (2018): Sorption of model pollutants on microplastics and toxicity assessment using early life stage of zebrafish (*Danio rerio*).** Cormier B., Larsson M., Yeung L., Clérandeau C., Kärrman A., Morin B., Engwall M., Bégout M.-L., Cousin X., Cachot J., Keiter S.H.
- **SEFA, Montpellier, France (2018): Quelle est la toxicité des microplastiques pour les premiers stades de développement des poissons ?** Cormier B., Le Bihanic F., Clérandeau C., Crebassa J.-C., Morin B., Bégout M.-L., Cousin X., Cachot J.

List of platform presentations (Involved)

- **ISPAC, Örebro, Sweden (2019): Ecotoxicological effects of microplastic contaminated with benzo[a]pyrene - Results from the Ephemare project.** Keiter S.H., Cormier B., Bégout M.-L., Cachot J., Cousin X., Larsson M., Engwall M.
- **Polymères et Océans, Créteil, France (2019): Conséquences physiologiques d'une exposition chronique de poissons à des microplastiques vierges ou contaminés.** Cormier B., Le Bihanic F., Joassard L., Keiter S., Cachot J., Bégout M.-L., Cousin X.
- **PRIMO 20, Charleston, South Carolina, USA (2019): Ecotoxicological effects of microplastics in marine ecosystems: insights from the EPHEMARE project.** Albentosa M., Avio C.G., Batel A., Bebianno M., Bégout M.L., Beiras R., Bellas J., Blust R., Braunbeck T., Cachot J., Carteny C.C., Cormier B., Cousin X., Cuesta A., Faimali M., Garaventa F., Gorbi S., Guilhermino L., Hylland K., Keiter S.H., Kopke K., Morin B., Pittura L., Regoli F., Town R.
- **MICRO, Lanzarote, Spain (2018): Physiological consequences of chronic exposure of marine medaka to microplastics.** Le Bihanic F., Cormier B., Misurale F., Joassard L., Keiter S.H., Cachot J., Bégout M.-L., Cousin X.
- **ECOBIM, Bordeaux, France (2018): Conséquences physiologiques de l'exposition de medaka marin à des microplastiques.** Le Bihanic F., Cormier B., Misurale F., Bringer A., Joassard L., Keiter S.H., Cachot J., Bégout M.-L., Cousin X.
- **ECOBIM, Bordeaux, France (2018): Toxicité comparée des microplastiques pour les premiers stades de développement de deux poissons modèles le medaka marin (*Oryzias melastigma*) et le poisson zebre (*Danio rerio*).** Le Bihanic F., Cormier B., Clérandeau C., Crebassa J.-C., Morin B., Bégout M.-L., Cousin X., Cachot J.
- **Polymères et Océans, Montpellier, France (2018): Toxicité des microplastiques pour les premiers stades de développement d'un poisson modèle : le medaka marin.** Le Bihanic F., Cormier B., Clérandeau C., Kärrman A., Morin B., Bégout M.-L., Cousin X., Keiter S.H., Cachot J.