

# Ellis Franklin

PhD Student · Bioinformatics & Ecotoxicology

Université de Lorraine, Metz, France

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## EDUCATION

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### PhD – Bioinformatics & Ecotoxicology

Université de Lorraine

**Title:** “Analytical tool and toxicological interpretation keys for time- and dose-dependent transcriptomic responses.” 2023 – Present

**Supervisors:** Prof. [Marie Laure Delignette-Muller](#) & Assoc. Prof. [Elise Billoir](#).

**Advisor:** Assoc. Prof. [Sophie Prud’homme](#).

### Master – Biodiversity, Ecology, and Evolution

Université de Lyon 1

**Topics:** Biodiversity and functioning of ecosystems · Bioinformatics and Modelling in Ecology · Bayesian Statistics · Genomics in Ecology and Evolution · Parasitological and Mutualistic Interactions. 2021 – 2023

### Bachelor – Life sciences

Université de Lyon 1

**Topics:** Community and Microbial Ecology · Ecophysiology · Genetics and Population Dynamics · Molecular tools for Ecology and Evolution. 2018 – 2021

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## RESEARCH EXPERIENCE

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### Doctoral Researcher

LIEC & LBBE

**Labs:** [LIEC](#) & [LBBE](#) · **Institutions:** Université de Lorraine & VetAgroSup · **Project:** [ANR Chroco](#)

2023 – Present

Ecotoxicogenomics thesis developing methodological approaches for analysis and interpretation of transcriptomic data modulated by contaminant dose and exposure time, across model (*Danio rerio*) and non-model (*Daphnia magna*) organisms.

**Axis 1:** [cluefish](#) – a workflow for structured biological interpretation of dose-response transcriptomic results ([Franklin et al., 2025](#)).

**Axis 2:** Extension of DRomics to time-dose-response data (in preparation, 2026).

More info: [theses.fr/s370682](https://theses.fr/s370682).

### Master's 2 Research Intern

LIEC, Université de Lyon 1

**Title:** “From modelling dose-response transcriptomic data to biological interpretation: an application to embryonic exposure of *Danio rerio* to DBP.” Jan – Jun 2023

Early development of [cluefish](#), addressing redundancy limitations of functional enrichment by combining ORA with PPIN construction and clustering (STRING, Cytoscape), biological databases (KEGG, WikiPathways, AnimalTFDB), and dose-response modelling metrics (BMDs, curve trends).

### Master's 1 Research Intern

LBBE, Université de Lyon 1

**Title:** “Development of a dose-response analysis on transcriptomic data to better understand the chronic effects of ionising radiation at low doses.” Apr – Jun 2022

First encounter with dose-response modelling applied to transcriptomic data, using [DRomics](#) to re-analyse RNA-seq data from *Danio rerio* embryos chronically exposed to ionising radiation. Addressed batch effect correction and explored the added value of a concentration-dependent framework, including BMD computation for ecological risk assessment.

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## PUBLICATIONS

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### Peer-reviewed articles

J. Ohanessian, S. M. Prud'homme, **E. Franklin**, G. Kitzinger, C. Lorgeoux, E. Billoir, V. Felten (2025). *Effects of dibutyl phthalate (DBP) on life history traits and population dynamics of Daphnia magna: comparison of two exposure regimes*. Peer Community Journal, 5. [DOI](#) · [Preprint](#)

**E. Franklin**, E. Billoir, P. Veber, J. Ohanessian, M. L. Delignette-Muller, S. M. Prud'homme (2025). *Cluefish: mining the dark matter of transcriptional data series with over-representation analysis enhanced by aggregated biological prior knowledge*. NAR Genomics and Bioinformatics, 7(3). [DOI](#) · [Preprint](#) · [GitHub](#)

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## COMMUNICATIONS

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### Oral – International

**E. Franklin** et al. (2024). *Interests and constraints towards unravelling endocrine disruptors mechanisms using dose-response transcriptomic data*. PRIMO22, Nantes, France. [HAL](#)

**E. Franklin** et al. (2025). *Exploring transcriptomic data with over-representation analysis enhanced by aggregated biological prior knowledge*. SETAC Europe, Vienna, Austria. [HAL](#)

**E. Franklin** et al. (2026). *Développement d'une méthode d'analyse intégrative de données transcriptomiques temps-dose-réponse (ENG: Development of an integrated analysis method for time-dose-reponse transcriptomic data)*. ECOBIM, Le Havre, France.

### Oral – National

**E. Franklin** et al. (2023). *Chronologie des effets et des réactions face à une exposition à un contaminant*. GDR Ecotox Aqua 2023, Metz, France.

**E. Franklin** et al. (2024). *Cluefish: exploration of transcriptomic data with over-representation analysis enhanced by aggregated biological prior knowledge*. GDR Ecotox Aqua 2024, Grenoble, France.

**E. Franklin** et al. (2025). *Unravelling transcriptomic response dynamics in ecotoxicology*. GDR Ecostat, Metz, France.

### Oral – Local & Internal

**E. Franklin** et al. (2026). *Cluefish: a workflow to make sense of transcriptomic dose-response data in ecotoxicology*. LBBE Internal Seminar, Lyon, France.

**E. Franklin** (2025). *Reproducible Research: Every little helps*. LEHNA Seminar, Lyon, France. [Slides](#) · [GitHub](#)

### Posters

**E. Franklin** et al. (2024). *From dose-response modelling of transcriptomic data to biological interpretation: an application to embryonic exposure of zebrafish to DBP*. PRIMO22, Nantes, France. [HAL](#)

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## AWARDS

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### 2024

**Best Oral Presentation Prize**, PRIMO22 Scientific Committee (Ifremer), Nantes, France.

**Best Illustration of Work**, DocDay, LIEC, Nancy, France.

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## TEACHING & SUPERVISION

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## Teaching Assistant

Université de Lorraine

Practical work for Master 2 students (16h): **R programming, ggplot2, and Quarto.**

2024

## Workshop – LIEC

Metz & Nancy

**A Step Towards Reproducible Research: Literate Programming.** Full-day interactive workshop designed and delivered independently for LIEC lab members (ANTRE initiative, organised with Elise Billoir). Structured in two parts: a discussion-based introduction to reproducibility challenges, followed by a hands-on Quarto session. [Workshop site](#) · [Materials](#) Feb 6, 2025

## Seminar – LBBE

Lyon

**Reproducible Research: Every little helps?** Half-day interactive seminar for the LBBE Student Seminar series ([Les Pinsons Migrateurs](#)). Covered the what, why, and how of reproducible research with discussion-driven format and interactive elements (Wooclap polls, drawing exercises). [Seminar site](#) · [Materials](#) Feb 21, 2026

## Student Co-supervision

LIEC, Metz

Co-supervision of Master 2 internship: *“Chronic dose-response exposure of Daphnia magna to dibutyl phthalate at various exposure durations: development and application of a respirometry test and monitoring of eye development.”* 2024

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## TRAINING HIGHLIGHTS

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### Best practices for reproducible research in numerical ecology

CESAB-FRB & GDR EcoStat, Montpellier

Whole 38h training week co-organised by [CESAB-FRB](#) and [GDR EcoStat](#). Covered the full reproducible research stack: project organisation, Git/GitHub, literate programming with Quarto, pipeline optimisation with targets, package development, dependency locking with renv, and containerisation with Docker. Nov 20–24, 2023

### Reproducible research : Methodological Principles for Open Science

France Université Numérique / Inria

Success · 24h · Reproducible research principles, computational notebooks (Jupyter, RStudio), version control with GitLab. 2024

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## SKILLS

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### Computational & Programming

**Languages:** R (advanced), Python (beginner–intermediate), Bash

**Reproducible research:** Quarto, R Markdown, renv, targets, Git · GitHub / GitLab / Codeberg

**Web & documents:** HTML, CSS, Typst, Markdown

**Software development:** Developed [cluefish](#) – a structured, fully documented R workflow.

### Bioinformatics

**RNA-seq preprocessing:** Salmon, Kallisto, HISAT2

**Differential expression & dose-response:** DESeq2, edgeR, DRomics

**Annotation:** biomaRt, KEGG, GO; identifier mapping across transcripts, genes, proteins

**Functional enrichment (ORA, FCS, pathway topology):** gprofiler2, clusterProfiler, topGO, DAVID; WGCNA

**Network biology:** PPIN construction and clustering (STRING, Cytoscape)

**Data visualisation:** ggplot2, patchwork, plotly integrated in Quarto reports.

### Statistics & Modelling

**Dose-response modelling:** item selection (ANOVA, linear/quadratic trend tests, custom trend tests), curve fitting and model selection, BMD computation, non-parametric bootstrapping

Multivariate analyses, cluster analysis and trees.

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## Languages

English: Native · French: Fluent.

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## SERVICE

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### PhD Representative

Represented doctoral researchers at the lab level for two years.

LIEC, Université de Lorraine

2023 – 2025

### Peer Review

Reviewer for *Nucleic Acids Research*.

### Memberships

SFBI (Société Française de Bioinformatique) · GDR StatOmique · GDR EcoStat · SETAC Omics Interest Group

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## OUTREACH & SCIENCE COMMUNICATION

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### Workshop Facilitator

DRomics: Dose-Response Curves for Omics.

GDR Ecotox Aqua, France

2024

### Fête de la Science

Co-organised and facilitated a 3-day public outreach event titled “*Prédateurs et Proies : dans l’océan, l’exemple des requins et des maquereaux*”, aimed at school groups and general audiences. Designed and ran a board game and simulation game to explain predator-prey dynamics.

LIEC, Metz, France

Oct 10-12, 2024

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