

Richard Bailleul

25, rue Jussieu
75005 Paris
✉ bailleul.richard@gmail.com

Education

- 2015-2019 **PhD in Developmental Biology**, CIRB, Collège de France.
- 2014-2015 **Research Master (M.S.) "Mathematics applied to Life Sciences"**, Paris-Sud University.
- 2011-2014 **Magistère (M.S.) in Mathematics**, Rennes 1 University and ENS Rennes.
- 2013-2014 **Agrégation (French teaching degree) in mathematics**, prepared at Rennes 1 University and ENS Rennes, option: probability and statistics.

Experience

Research

- 2015-2019 **PhD. CIRB, Collège de France,**
Patterning of the avian skin: mathematical modelling of embryonic dynamics.
Supervisors: Marie Manceau, Jonathan Touboul and Benoît Perthame.
Development of an approach enabling a dialogue between mathematical and biological inputs. Particular focus on the formation and evolution of the patterning of dorsal feather tracts in birds, mostly via hybrid reaction-diffusion-chemotaxis models.
- 2015 **Master internship. CIRB, Collège de France,**
Models for the emergence of skin patterns.
Supervisors: Marie Manceau, Jonathan Touboul and Benoît Perthame.
PhD project set up and framing through an in-depth study of the bibliography in developmental biology and modeling, analytical study and simulations of classical models of skin patterning, learning of basic experimental skills.
- 2013 **Magistère internship. CIRB, Collège de France,**
Breathing pulses and fronts in delayed neural-field equations.
Supervisor: Jonathan Touboul.
First opportunity to confront mathematical frameworks to biological behaviors, through the study of bifurcations in a class of integro-differential equations.
- 2012 **Licence internship. Rouen University,**
Simulation of invariant distributions for Markov chains, the 'Coupling From The Past' algorithm from Propp and Wilson.
Supervisor: Thierry de la Rue.

Teaching

- 2016-2018 **Teaching assistant,**
"Series, integrals, linear algebra" (108h) and "Matrix calculation" (36h).
Sorbonne University
- 2011-2015 **Tutoring,**
Private tuitions in mathematics, high school to license level.

Competences

Computer skills

Programming	Caml, C++ (basics).
Simulation	Matlab, FreeFem++, Python (basics).
Data analysis	Prism, ImageJ.
Edition	Office, L ^A T _E X.

Animal experimentation

Bird embryos handling, dissection, morphological analysis, drug treatment.

Cellular and molecular biology

In situ hybridization, probe synthesis, immunohistochemistry.

Imaging

Confocal imaging on tissue sections and skin explants.

Languages

French	Mother tongue
English	Fluent
Spanish	Scholar level

Research communication

- 2018 **Workshop "Mathematical modelling of tumor growth and wound healing"**, *oral presentation and group work*, Les Treilles Foundation.
- 2018 **Intern seminar of the Center of Interdisciplinary Research of Biology**, *oral presentation*, Collège de France.
- 2017 **Seminar of the Roscoff biology station**, *oral presentation*.
- 2016 **Summer school "Probability and PDE for biology"**, *poster presentation and group work*, CIRM (Aix-Marseille University).

Publications

Bailleul R., Desmarquet-Trin Dinh C., Hidalgo, M., Curantz C., Touboul J., Manceau M.
Symmetry breaking in the embryonic skin triggers directional and sequential front of competence during plumage patterning.
BioRxiv, <https://doi.org/10.1101/491092> (2018)

Haupaix N., Curantz C., Bailleul R., Beck S., Robic A., Manceau M.
The periodic coloration in birds forms through a prepatterning of somite origin.
Science **361**, 6408 (2018)

References

Marie MANCEAU, marie.manceau@college-de-france.fr, +33 1 44 27 15 22.
Jonathan TOUBOUL, jtouboul@brandeis.edu, +1 781-736-3080.