



Margaux FAILLA

Engineer & Lab manager

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Summary and Project description

I come from France where I did my integral studies. My first master's year was about genetics, immunology and animal development. After that, I specialized in imaging systems and image analysis for biology. I obtained my Master degree in 2016 after 2 experiences in research laboratories. One was about molecular biology and genetics in the immunology domain, and the second one, was about imaging systems applied for research on an ascidian model, *Phallusia mammillata*.

Since 2017, I moved to New York City. I joined Lionel Christiaen's lab to start as an Engineer.

My project is about establishing a microscopy-based high content screening in *Ciona robusta*. Preliminary, I designed and prepared the single-guide RNA to achieve the cell-specific gene loss-of-function for this assay. Now, I am focusing on targeting genes to capture and analyze the morphogenetics features that characterize the cardiopharyngeal cells. I'm developing a pipeline to carry out this high content image analysis to screen for phenotypes associated with CRISPR knockouts of target genes. With these results, we will be able to elaborate a biomolecular network model for cardiopharyngeal cell behavior in *Ciona robusta*, and provide a resource that can be used by others in the community in different developmental contexts.

Moreover, I'm trying to implement in our lab a system to miniaturize and help the imaging of many embryos and getting closer to high throughput experiments for live and fixed imaging.

Education

2015-2016	Master Imaging and Applied Systems to Biology	Nice-Sophia Antipolis University
2014-2015	Master Genetics, Immunology & Animal Development	Nice-Sophia Antipolis University
2013-2014	Bachelor Molecular Biology and Genetics	Nice-Sophia Antipolis University
2011-2013	Classe Prépa., Biology (BCPST)	Lycée Massena

Positions and Employment

Engineer & Lab manager (current position)

New York (USA)

April 2017 - present: Lionel Christiaen Lab, New York University, Center for Developmental Genetics, Department of Biology

- o Design, prepare and validate a library of sgRNA reagents for CRISPR/Cas9-mediated loss of function assays in *Ciona* embryos
- o Obtain embryos transfected with sgRNA and markers to achieve cell specific gene loss-of-function
- o Develop a microscopy-based systematic CRISPR/Cas9-mediated mutagenesis in *Ciona robusta*
- o Molecular biology techniques, CRISPR-Cas9 tool, Confocal Imaging, Epifluorescence, Image processing and 3D reconstruction (ImageJ, Imaris...)
- o Perform specific tasks to contribute to the maintenance of the lab's working environment

Research Support

Sophia-Antipolis (France)

October 2016 - December 2016 (3 months): Team STARS, François Brémond Team, Institut National de Recherche en Numérique et Informatique (INRIA)

Supervisor: Michal Koperski and Jane Desplanques

- o Semantic description of what is happening in the scene viewed by video cameras (Human action annotations)
- o Implementation of annotated videos for machine learning project

Trainee - Master Student

Villefranche-sur-Mer (France)

January 2016 - June 2016 (6 months): Alex McDougall Team "Cell cycle in Eggs and Embryos", CNRS UMR 7009 LBDV

Supervisors: Janet Chenevert and Christian Rouvière

- o Study of cortical forces during unequal cleavage with 3D imaging and reconstruction techniques
- o Implementation of optimized protocols; Confocal Imaging, Epifluorescence, SPIM; Image processing and 3D reconstruction (ImageJ, Imaris...)

Trainee - Master Student

Nice (France)

February 2015 - June 2015 (5 months): Jaap Neels Team "Adaptive responses to immuno-metabolic deregulation", INSERM U1065 C3M

Supervisors : Jaap Neels and Isabelle Satney

- o Study of PPAR β in thymocytes apoptosis induced by glucocorticoids
- o Cell purification by Magnetic sorting, Cell Isolation, Cell Culture, Cell Labelling, Flow Cytometry, Quantitative PCR

Publications

2017

1. Vlad Costache, Celine Hebras, Gerard Pruliere, Lydia Besnardeau, Margaux Failla, Richard R. Copley, David Burgess, Janet Chenevert & Alex McDougall. Kif2 localizes to a subdomain of cortical endoplasmic reticulum that drives asymmetric spindle position. Nature Communications, 2017, 8: 917. DOI: 10.1038/s41467-017-01048-8

Conferences & Workshops

- 2019 10th Tunicate meeting - Poster - Villefranche-sur-mer, France
M. Failla, Y. Bernadskaya, and L. Christiaen. A library of single guide RNA constructs for systematic CRISPR/Cas9-mediated mutagenesis in *Ciona Robusta*, 2019
- 2017 9th Tunicate meeting - Conference organization - New York City, USA
- 2016 Journées André Picard - Poster - Sorbonne University (Paris VI) - Paris, France
M. Failla, P. Stolz, V. Costache, C. Hebras, G. Pruliere, R. Dumollard, C. Rouviere, M. Gho, A. Mcdougall, J. Chenevert. Analyzing cortical pulling forces during unequal cleavages in the ascidian embryo, 2016
- 2015 AFC Congress - Poster and Congress organization - Juan les Pins, France
M. Failla, & M-J. Dejardin. Deep imaging on whole organisms or on thick tissues by using clarification methods, 2015 (poster for Master program mentored by C. Medioni, O. Pierre, C. Rouvière and F. Brau)