



19/11/1990 (28)  
Married, 1 daughter

# David Granjon

## PhD in Mathematical Physiology

### Education

2013 - 2016 **PhD in Life Sciences** [Université Pierre et Marie Curie, Paris](#), [Université de Lausanne, Switzerland](#)  
*Title of the Thesis: "Modeling of Calcium Homeostasis in the Rat and its Perturbations".*

*Building of a mathematical model describing calcium homeostasis, including its analysis and simulation of pathologies.*

*Thesis advisors: Dr. Aurélie Edwards and Pr. Olivier Bonny.*

2011 - 2013 **Master's Degree in Ecosciences, MIV** [Université Claude Bernard \(UCBL\), Lyon](#)  
Main subjects: Mathematics, Theoretical Ecology and Programming.

2010 - 2011 **Licence (3 year degree) in Mathematics and Computer Sciences for the Living (MIV)** [Université Claude Bernard \(UCBL\), Lyon](#)  
Main subjects: Mathematics, Ecology and Computer Sciences.

2008 - 2010 **Preparatory School for Engineers** [Lycée Claude Fauriel, Saint Etienne](#)  
Main subjects: Mathematics, Physics, Biology, Geology.

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[Linkedin Profil](#)

[Personal Website](#)  
[RinterFace](#)

### Current Position

06/17 - Now **Post Doctoral Researcher**

[The Interface Group, University of Zurich \(UZH\)](#)

Two main projects:

- develop user-friendly interfaces of Calcium and Phosphate Homeostasis, using the R-Shiny package, javascript and C. Management of linux web servers. Design new interactive tools dedicated to teaching courses.
- build a model linking the cardiac and renal functions, to better understand the interplay between chronic kidney disease as well as cardiac failure. Create virtual patient populations using Monte Carlo simulations.

*Supervisors: Dr. Diane de Zélicourt, Pr. Vartan Kurtcuoglu.*

### Programming



### Languages

French ★★★★★  
English ★★★★★

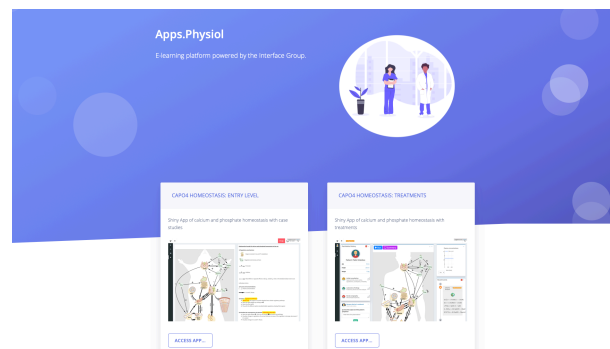


Figure 1: Apps.Physiol eLearning Platform: <http://physiol-seafile.uzh.ch>.

## Contacts

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Pr. Vartan Kurtcuoglu  
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## Previous Experiences

01/17 - 03/17 **Post Doctoral Researcher**

[CHUV | Lausanne university hospital, Switzerland](#)

Improvements to the model developed during my doctoral thesis. Publication of a second article (see publications).

*Supervisors: Dr. Aurélie Edwards and Pr. Olivier Bonny.*

07/13 - 08/13 **Internship in a Team of Theoretical Physiology**

[Centre for Applied Mathematics in Bioscience and Medicine \(CAMBAM\), Mc Gill University, Montreal, Canada](#)

Improvements to the model developed during the previous internship.

*Supervisors: Dr. Moisés Santillan, Pr. Michael Mackey.*

01/13 - 07/13 **Internship in a Laboratory of Applied Mathematics**

[Institut National de Recherche en Informatique et Automatique \(INRIA\), Team Dracula, Lyon](#)

*Title of the project: "Multiscale modeling of Zebrafish Somitogenesis"*

Development of a model accounting for the intra-cellular oscillator in each cell during somitogenesis.

*Supervisors: Dr. Laurent Pujo-menjouet (UCBL), Pr. Michael Mackey (Mc Gill, Canada).*

03/12 - 07/12 **Internship in a Laboratory of Applied Mathematics**

[Institut National de Recherche en Informatique et Automatique \(INRIA\), Team Dracula, Lyon](#)

*Title of the project: "Mathematical modeling of somitogenesis, reaction-diffusion systems".*

Analysis of two mathematical models: cell-cycle and clock/wavefront models.

*Supervisor: Dr. Laurent Pujo-Menjouet (UCBL).*

06/11 - 08/11 **Internship in a Laboratory of Theoretical Ecology**

[Laboratoire de Biométrie et Biologie Evolutive \(LBBE\), Team Modélisation et Ecotoxicologie Prédictive \(MEPS\), Lyon](#)

*Title of the project: "Ecotoxicology of Daphnia Magna".*

Study of the impact of pollution on the growth of Daphnia Magna through mathematical models.

*Supervisors: Pr. Sandrine Charles (UCBL), Pr. Marie Laure Delignette Muller (Ecole Nationale Vétérinaire de Lyon).*

## Awards

5/04/19

[2019 RStudio Shiny Contest.](#)

**Runner-Up price:** *A Virtual Lab for Teaching Physiology, details here.*

2/02/18

[NCCR Kidney.CH Retreat 2018.](#)

**Best Poster Award, 2nd price:** *A web-based application of Calcium and Phosphate Homeostasis.*

## Software Development - R packages

12/18 - Now **RinteRface**

[CRAN](#)

*Description: "A comprehensive collection of HTML templates for Shiny".*

This project aims at bringing the most famous HTML templates to Shiny, only with R.

*Documentation: <https://rinterface.com>*

01/19 - Now **tablerDash**

[CRAN](#)

*Description: "Bootstrap 4 dashboard template for shiny".*

tablerDash is built upon Tabler.io, a light but powerful and modern Bootstrap 4 HTML template.

*Documentation: <https://rinterface.github.io/tablerDash/>*

09/18 - Now **argon R Suite**

[CRAN](#)

*Description: "Bootstrap 4 argon HTML template".*

R wrapper around the argon HTML library for static templates as well as dynamic dashboards, fuelled by Shiny.

*Documentation: <https://rinterface.github.io/argonR/index.html> and <https://rinterface.github.io/argonDash/index.html>*

06/18 - Now **bs4Dash**

[CRAN](#)

*Description: "Bootstrap 4 shinydashboard using AdminLTE3".*

Build Bootstrap 4 dashboards using the full power of AdminLTE3, a dashboard template built on top of Bootstrap 4. See more at <https://github.com/almasaeed2010/AdminLTE/tree/v3-dev>.

*Documentation: <https://rinterface.github.io/bs4Dash/index.html>.*

CRAN

*Description: "Extensions for shinydashboard".*

Extend shinydashboard with AdminLTE2 components. AdminLTE2 is a free Bootstrap 3 dashboard template available at <https://adminlte.io>. Customize boxes, add timelines and a lot more.

Documentation: <https://rinterface.github.io/shinydashboardPlus/>.

## Publications

## An eLearning platform to teach calcium and phosphate homeostasis

D. Granjon, O. Bonny, F. Verrey, V. Kurtcuoglu and D. de Zelicourt

*Submitted to American Journal of Physiology-Advances in Physiology Education, 2019.*

## Coupling between Phosphate and Calcium Homeostasis: A Mathematical Model

D. Granjon, O. Bonny, A. Edwards

*American Journal of Physiology-Renal Physiology, 2017.*

## A Model of Calcium Homeostasis in the Rat

D. Granjon, O. Bonny, A. Edwards

*American Journal of Physiology-Renal Physiology*, 311 (5), 2016.

## Conferences and Talks

31/01/19

- 01/02/19

## NCCR Kidney.CH Retreat 2019

Murten, Switzerland

Oral presentation: "Web applications for physiology: bridge the gap between research and teaching".

09/09/18

- 12/09/18

**NCCR Kidney.CH Summer School 2018**

Zurich, Switzerland

Poster first author: "Web-based e-learning tools of Calcium and Phosphate Homeostasis".

08/07/18

- 12/07/18

## World Congress of Biomechanics 2018

Dublin, Ireland

Poster first author: "Addressing biomedical diversity via eLearning, an example from a physiology curriculum".

- 01/02/18  
- 02/02/18 **NCCR Kidney.CH Retreat 2018** [Murten, Switzerland](#)  
Poster first author: "A web-based application of Calcium and Phosphate Homeostasis".
- 17/10/17 **Bachelor-Themenworkshops 5. Semester HS 2017** [Zurich University of the Arts, Switzerland](#)  
Oral presentation: Computational Physiology.
- 5/05/17 **Lunch Seminar** [Institute of Physiology, Zurich \(UZH\)](#)  
Oral presentation: "A mathematical model of calcium and phosphate homeostasis in the rat and its perturbations".
- 29/06/16  
- 1/07/16 **Meeting of the Federation of Physiological Societies and the French Physiological Society** [Centre de Recherche des Cordeliers, Paris](#)  
Poster presentation: "Role of the rapidly exchangeable calcium pool in bone in calcium homeostasis".
- 23/03/16  
- 24/03/16 **Annual Franco-Swiss Meeting on Electrolytes Metabolism and Renal Physiology** [Inselspital, Bern](#)  
Oral presentation: "A model of  $\text{Ca/P}_i$  homeostasis in the Rat".
- 25/02/16  
- 27/02/16 **NCCR Kidney.CH Retreat 2016** [Murten, Switzerland](#)  
Poster first author: "Role of the bone rapidly exchangeable calcium pool in calcium homeostasis".
- 29/09/15  
- 02/10/15 **Société Francophone de Dialyse/Société de Néphrologie** [Lyon, France](#)  
Poster first author: "Consequences of primary hyperparathyroidism on renal calcium excretion".
- 19/03/15  
- 20/03/15 **Annual Franco-Swiss Meeting on Electrolytes Metabolism and Renal Physiology** [Centre de Recherche des Cordeliers, Paris](#)  
Oral presentation: "A Model of Calcium Homeostasis in the Rat".
- 6/02/15 **Groupe de travail Modélisation Numérique et Images** [MAP5, Paris Descartes](#)  
Oral presentation: "Calcium Homeostasis modeling and perturbations".

- 19/03/14  
- 20/03/14 **Annual Franco-Swiss Meeting on Electrolytes Metabolism and Renal Physiology** [CHUV, Lausanne](#)  
Oral presentation: "A Simplified Model of Plasma Calcium Regulation by PTH".
- 3/06/13  
- 6/06/13 **Conference " In honour of Michael Mackey's 70th birthday "** [Lyon, France](#)  
Oral presentation: "Oscillatory dynamic during zebrafish somitogenesis".

## Mentoring

- 08/18  
- 06/19 **Master Student supervisor** [Zurich, Switzerland](#)  
Supervised a master student in computational physiology: "Turn a physiological mathematical model into a gaming engine".
- 02/18  
- 07/18 **Master Student Co-Supervisor** [Zurich, Switzerland](#)  
Co-supervised a master student in applied mathematics: "Computational modeling of flow and solute transport in the nephrons of a kidney".
- 11/15  
- 06/16 **Student Supervisor** [Centre de Recherche des Cordeliers, Paris](#)  
Supervised a high school student for the "Young Researchers" program. Introduction to modeling and experimentations.

## Teaching

- 10/18  
- 11/18 **Teaching assistant** [Zurich, Switzerland](#)  
Practical courses about : "Blood formation", 20h.
- 04/18  
- 05/18 **Teaching assistant** [Zurich, Switzerland](#)  
Practical courses about : "Hearing". Absolute audiometry, determination of isophones, clinical audiometry, auditory localization and otoacoustic emissions, 30h.

## Detailed Knowledge

- **Web-based Application Development** ★★★★★

Expert in the development of R-Shiny web-applications (as well as HTML, CSS, Javascript).

- **Web-server Management** ★★★★★

Expert in creating and managing virtual machines, dedicated to host web servers or speed up simulations.

- **R Language** ★★★★★

Expert in R development for dynamical system analysis.

- **Version Control** ★★★★★

Git/Github as version control software.

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- **Dynamical Systems Analysis** ★★★★★

Steady states, linearization, stability, Lyapunov theory, limit cycle existence (Poincaré-Bendixon theorem), bifurcation analysis (Hopf bifurcation), sensitivity analysis and some control theory.

- **Differential Equations Theory** ★★★★★

Ordinary differential equations, partial differential equations, delay differential equations basic properties and important results.

- **Algebra and Analysis** ★★★★★

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- **Physiology** ★★★★★

Calcium and phosphate metabolism, renal physiology, cardiac physiology.

- **Ecology** ★★★★★

Basic properties of ecosystems, evolution theory, prey-predators interactions, host-parasites systems.

Updated: 08/12/2018