

Curriculum Vitæ

Olivier ALI

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Previous positions

2016 - 2017 Research associate in the Inria Project-Team Project Virtual Plants — *Inria Research Center of Sophia-Antipolis Méditerranée, Campus of Montpellier.*
Team leader: [Christophe Godin](#)

2012 - 2016 Postdoctoral Scholar in the RDP Laboratory — *ÉNS Lyon, France*
Topic: Multi-scale theoretical modelization & numerical simulation of mechanical stress influence on plant morphogenesis.
Research advisor: [Jan Traas](#)

2012 - 2014 Visiting fellow in The Inria Team Project Virtual Plants — *Inria Research Center of Sophia-Antipolis Méditerranée, Campus of Montpellier.*
Goal of the visit: Set the foundations of a 4D Numerical simulation framework dedicated to the study of plants tissular growth with cellular resolution.
Host research advisor: [Christophe Godin](#)

2006 - 2010 Ph.D. Candidate in the Institute for Advanced Biosciences — *University of Grenoble*
Topic: Theoretical study of adhesive proteins clustering dynamics.
Team leader: [Corinne Albigès-Rizo](#)

Other professional experience

2010 - 2012 Freelance graphics designer — *Indy Eye Studio - Lyon, France*
Photography, illustration & print.
Web: www.indyeyestudio.com

Academic education

2006 - 2010 Ph.D. in Physics (opt. Physics of living systems) — *University of Grenoble*
Thesis title: Theoretical study of mecano-chemical transduction in cellular adhesion.
Ph.D. Advisor: [Bertrand Fourcade](#)

2005 - 2006 Master in Physics (opt. Physics-Biology Interface) — *University of Paris XI / Institut Pasteur / ENS Paris*

2002 - 2005 Student (normalien) at École Normale Supérieure de Cachan — *ÉNS Cachan / University of Paris VI*
2004 - 2005: Agrégation de Physique (Teaching diploma high school & college level).
2002 - 2004: Bachelor (L3 & M1) in Fundamental Physics.

Additional education

07 2014 International Physics summer school — *Les Houches, France*
Title: Integrated structural and cell Biology from molecules to cells and organisms: Thinking out of the box.
Duration: One month, full time.

11-12 2005 Special course Genomes Analysis – Institut Pasteur, Paris
Topic: Theoretical and practical (wet lab and *in silico*) courses on genome analysis technics.
Duration: Two month, full time.

Supervision and teaching activities

2021-2022 Master internship and Starting Engineer co-advisor of Elsa Gascon — CNRS, ENS Lyon, Fr.

Since 2021 External member of the PhD supervision committee of Rawen Ben Malek — Doctoral school 567 (Plant Sciences) University Paris-Saclay.

Since 2021 Reviewer and jury member for Master internship evaluation within the Bioscience Master — ENS Lyon, Fr.

Dec 2019 Introduction to modeling plant biomechanics. Invited contributor — lecture & practical course (8h) — in a Master program — Swedish University of Agricultural Sciences Umeå, Sweden.

2016 - 2017 Starting Engineer co-advisor of Florian Gacon — Inria Grenoble Rhône-Alpes Research Center.

2016 - 2019 PhD co-advisor of Hadrien Oliveri — University of Montpellier & ENS Lyon, France.

2010 - 2012 Physics & Biophysics lecturer — IDSL MediPlus Lyon, France
Lecturer in a private medical school (Permanent position).

2007 - 2010 Teaching assistant (Moniteur) — Dpt. of Physics, University of Grenoble
Course topic: Interdisciplinary undergrad (L1) course on microscopy imaging.

Editorial and reviewing activities

Since 2018 Review editor for Frontiers in Plant Science, section plant biophysics and modeling.

Since 2017 Registered reviewer on Publons, with reviewing contributions for: *The European Physical Journal Plus*, *the International Journal of Molecular Sciences*, *PLOS Computational Biology*, *Cell Reports*, *The Biophysical Journal*, *Frontiers in Plant Science* and *Scientific Report*.

Administrative responsibilities & service to the community

2021 Reviewer for the French National Agency for Research (ANR).

Since 2021 Appointed member of the laboratory council at the Laboratoire de Reproduction et Développement des Plantes — ENS Lyon, Fr.

Since 2020 Board member of the CAN (Conseil d'Analyse Numérique) of the SFR Biosciences.
The CAN missions are threefold: (i) identify the needs, (ii) identify the know-how & (iii) organize the training of the registered biology labs in terms of computational tools and methods.

2020 President of an Inrae selection committee to hire an assistant engineer specialized in numerical simulations and image analysis (Concours Inrae IE BAP-E n°IE20-BAP-2).

Peer-reviewed publications

†: (co-) first author, ‡: (co-)corresponding author

- **BVPy: A FEniCS-based Python package to ease the expression and study of boundary value problems in Biology.**‡
Gacon, F. *et al.* — Journal of Open Source Software (2021)
- **Microtubule-Mediated Wall Anisotropy Contributes to Leaf Blade Flattening.**†
Zhao, F. *et al.* — Current Biology (2020)
- **Simulating Turgor-Induced Stress Patterns in Multilayered Plant Tissues.**†
Ali, O. *et al.* — Bulletin of Mathematical Biology (2019)
- **Regulation of plant cell wall stiffness by mechanical stress: a mesoscale physical model.**‡
Oliveri, H. *et al.* — Journal of Mathematical Biology (2018)
- **Transcriptional induction of cell wall remodelling genes is coupled to microtubule-driven growth isotropy at the shoot apex in Arabidopsis.**
Armezzani, A. *et al.* — Development, 145 (2018)
- **DRACO-STEM: An Automatic Tool to Generate High-Quality 3D Meshes of Shoot Apical Meristem Tissue at Cell Resolution.**
Cerutti, G. *et al.* — Frontiers in Plant Science, 8 (2017)
- **Force-Driven Polymerization and Turgor-Induced Wall Expansion.**†
Ali, O. & Traas, J. — Trends in Plant Science, 21(5) (2016)
- **A computational framework for 3D mechanical modeling of plant morphogenesis with cellular resolution.**†
Boudon, F. *et al.* — PLoS Computational Biology, 11(1) (2015)
- **An auxin-mediated shift toward growth isotropy promotes organ formation at the shoot meristem in Arabidopsis.**
Sassi, M. *et al.* — Current biology, 24(19) (2014)
- **Physical models of plant development.**†
Ali, O. *et al.* — An. rev. of cell & dev. biol., 30 (2014)
- **Cooperativity between integrin activation and mechanical stress leads to integrin clustering.**†
Ali, O. *et al.* — Biophysical Journal, 100(11) (2011)
- **Excitable waves at the margin of the contact area between a cell and a substrate.**†
Ali, O. *et al.* — Phys. Biol, 6(2) (2009)
- **Physical model for membrane protrusions during spreading.**
Chamaroux, F. *et al.* — Phys. Biol, 5(3) (2008)

Selected international conferences & invited lectures

- **The size of seed to come: How endosperm turgor pressure both promotes and restricts seed growth and size.**
Invited speaker at the 1st Hormone & Cell wall Seminar — *Umeå, Sweden* (2019).
- **Mechanical Control of seed size in Plants.**
Invited speaker at the Cell & Tissue Mini-symposium — *held on line by the Mechano-Biology Institute & the National University of Singapore* (2021).
- **Against the grain: Modeling seed growth control as an mechano-sensitive incoherent feedforward loop.**
Invited speaker at the Cambridge Morphogenesis Seminar — *held on line by Cambridge University* (2021).

- **The role of inner mechanical stresses during flat organ morphogenesis.**
Invited speaker at the Umeå Plant Science Center — *Umeå, Sweden* (2019).
- **Simulations & analysis of turgor-induced stress patterns in 3D multi-layered structures .**
Contributed lecture at the 19th International Conference on System Biology — *Lyon, France* (2018).
- **The missing link between plant cell wall rheology and mechanobiology.**
Invited speaker at the BIRS workshop entitled Multiscale Modeling of Cell Wall Mechanics and Growth in Walled Cells — *Banff, Canada* (2015).
- **A conceptual & computational multiscale approach for 3D mechanical modeling of plant morphogenesis.**
Contributed lecture at the LyonSysBiol conference — *Villeurbanne, France* (2014).
- **Mechanical modelling & numerical simulation of organogenesis at the shoot apical meristem of *Arabidopsis Thaliana*.**
Invited speaker at an Agropolis Seminar — *Montpellier, France* (2014).
- **Excitable waves at the margin of the contact area between a cell and its substrate.**
Contributed lecture at the European congress on Cell Mechanics — *Bad Honnef, Germany* (2009).

Skills

Languages: French (mother tongue)
English (fluent)

Scientific expertise: Statistical physics
Dynamical systems analysis - ODE, PDE, NL PDE Continuum mechanics
Finite Element Modeling
Computational physics
System Biology
Molecular biology

Computer skills: Scientific Python,
Python Library architecture
Versioning (Git)
Basic knowledge in Swift and C++.
Formal calculation & equation solving softwares (Mathematica)
Basic knowledge in web design and mastering (Wordpress, Google site)

Experimental skills: Basic knowledges in cell and plant culture.
Basic knowledges in confocal microscopic and image processing.