

LEVAYER Romain CV

Cell death and epithelial homeostasis lab

<https://research.pasteur.fr/en/team/cell-death-and-epithelial-homeostasis/>

Institut Pasteur

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Date of birth: 16/12/1984

Nationality: French

Married, one child

Academic positions and education background

March 2018: HDR degree (Habilitation to direct research, required for recruitment of PhD student), University Paris Sud, Paris (FR).

Since December 2016: G5 group leader (Cell death and epithelial homeostasis), Department of Developmental and Stem Cell Biology, Institut Pasteur, Paris (FR).

September 2012-November 2016: Post-doc in Eduardo Moreno's group. Institute of Cell Biology (ICB), University of Bern. "Quantitative description of loser cell elimination during cell competition" (CH).

October 2011-September 2012: Short term post-doc in Thomas Lecuit's group, IBDMML

2007-2011: PhD "Regulation of adhesion in a remodelling epithelium", supervisor: Thomas Lecuit, IBDMML, University Aix-Marseille 2 (FR).

2006-2007: Master 2 Interdisciplinary approach of Life sciences (AIV), ENS/Paris 7 (FR).

2005-2006: Master 1 Molecular Biology of the Cell, ENS/Paris 6 (FR).

2004-2005: Bachelor in biology at the "École Normale Supérieure" (ENS), Paris (FR).

2002-2004: Two years of "classe préparatoire" BCPST (Biology, Chemistry, Physics and Geology), Grenoble (FR).

Meetings and conferences

April 2018: Invited speaker Department of Genetics, Harvard Medical School, Boston (USA)

January 2018: Invited speaker GReD, Clermont-Ferrand (FR)

December 2017: Invited speaker Institut Jaques Monod, Paris (FR)

September 2017: Invited speaker EMBO workshop "Dynamics of living systems", Cargese (FR)

September 2017: Short talk European Drosophila Research Conference, London (UK)

June 2017: Short talk Drosophila meeting Iles-de-France, Paris (FR)

June 2017: Short talk Qbio symposium “Mechanical forces in Biology”, Paris (FR)

March 2017: Invited speaker, Institut Curie, Paris (FR).

February 2017: Invited speaker, Institut de Biologie Paris Seine, Paris (FR).

February 2017: Invited speaker, Centre de Biologie du Développement, Toulouse (FR).

September 2016: Invited speaker, French Drosophila meeting, Nice (FR).

June 2016: Short talk, Swiss Drosophila meeting, Zürich (CH).

May 2016: Short talk, SFBD meeting “Shaping life”, Marseille (FR).

May 2016: Invited speaker, department meeting Dunn School of pathology, Oxford University (UK).

November 2015: Invited speaker, IRCM, Montpellier (FR).

July 2014: Poster presentation at the HFSP awardees meeting, Lugano (CH).

July 2014: Participation to the 2014 Lindau medicine and physiology Nobel laureate meeting (DE).

June 2014: Invited speaker of the post-doc retreat of the Max Planck Institute for Molecular Cell Biology and Genetics, Dresden (DE).

June 2014: Short talk, Swiss Drosophila Meeting 2014, Fribourg (CH).

January 2014: Poster presentation at the workshop “Mechanics of growth and tissues: from development to cancer”, Curie Institute, Paris (FR).

November 2014: Invited speaker at Center for Models of SLife, Niels Bohr Institute, Copenhagen (DK).

April 2013: Poster presentation, Drosophila genetics meeting, Washington DC (USA).

May 2012: Poster presentation at the meeting “Systems biology of Drosophila development”, European Science Foundation meeting (PL).

March 2012: Invited speaker at the Genetics and Developmental biology department, Curie Institute, Paris (FR).

May 2010: Short talk at the 2nd joint SFBD-JSDB meeting (Developmental biology societies of France and Japan), Paris (FR).

September 2009: Poster presentation, ISDB meeting, Edinburgh (UK).

September 2008: Poster presentation, SFBD meeting, Giens (FR).

June 2006: Poster presentation at the *C. elegans* Development and Evolution topic meeting, University of Wisconsin, Madison (USA).

Additional training

March 2015: EMBO lab management course for postdocs, Leimen (DE).

August 2013: Summer school “New approaches to morphogenesis: live imaging and quantitative modeling”, University of Santa Barbara (USA).

September 2010: EMBO workshop “Microscopy, modelling and biophysical methods”, EMBL, Heidelberg, (DE).

April-June 2007: Internship: “Tracking Delta endocytosis with quantum dots in *Drosophila notum*”, advisors: François Schweisguth and Maxime Dahan, Biology department, ENS; Kastler Brossel laboratory, Physic department, ENS, Paris (FR).

January-March 2007: Internship: “*In vitro* synthesis of an actomyosin cortex”, advisor: Cécile Sykes, physicochemistry laboratory, Curie Institute, Paris (FR).

September-December 2006: Internship: “Modélisation of Bicoid diffusion and spatial regulation of Gap genes expression”, advisors: Vincent Hakim and Nathalie Dostatnie, LPS, ENS Paris, and Curie Institute, Paris (FR).

February-July 2006: Internship: “Looking for new MBK-2’s substrates targeted for degradation”, advisor: Géraldine Seydoux, Johns Hopkins School of Medicine, Baltimore (USA).

June-July 2005: Internship: “Modulation of the mosquito *Aedes aegypti* egg-laying behaviour by an intracellular parasite (*Edhazardia aedes*)”, advisor: Jacob Koella, Evolutionary parasitology laboratory, University Paris 6 (FR).

Teaching

January 2018: Organisation of a course and practical work around “The contribution of physics to developmental biology”, Molecular Biology of the Cell course, Institut Pasteur, Paris (FR).

November 2017: Advanced microscopy course, University of Fribourg (CH), “Practical aspects of *in vivo* live imaging and quantitative methods”, Fribourg (CH).

September 2017: Master2 student course Paris 7, “Deciphering the war code of cell: cell competition in development and disease”, Paris (FR).

March 2017: Bachelor student course at the Ecole Normale Supérieure, “Deciphering the war code of cell: cell competition in development and disease”, Paris (FR).

2016: Microscopy course for the imaging platform (MIC) of Bern University, hands on sessions for confocal and live imaging, Bern (CH).

2013 to 2016: Teaching to bachelor students, Introduction to *Drosophila* genetics (course and practical works), ICB, University of Bern (CH).

September 2008 to 2011: Teaching of cell biology to undergrad students (practical works, courses and working groups), university Aix-Marseille II.

October 2010: Master2 teaching, “epithelial morphogenesis”, University Aix-Marseille II

Mentoring

December 2016 to present: Mentoring of two M1 students, Kalina Belcheva (international selection through the Amgen program, currently applying for Doctoral schools in the US), Lucia Rodriguez (University Pompeu Fabra of Barcelona), L2 student Christina Fissoun (Université Cergy Pontoise). Mentoring of three M2 students, Szusanna Gere (AIV master, 3 months rotation Sept-Dec 2017), Jakub Voznica (AIV master, 3 months rotation Jan-March 2018), and Alexis Villars (M2 Gene Cells and Development, Jan-June 2018, Paris 11).

April 2014 to December 2015: Project management and training of two Master2 students (Julia Müller, Carole Dupont), Project management and training of a bachelor student (Michael Berger, Tsering Wüthrich).

Scientific outreach

November 2017: Organisation of a scientific outreach meeting in high school (opération Declics, Lycée Victor Duruy, Paris), short presentation and speed scientific meeting.

2016: Participation to a scientific speed meeting (organized by the FSER, Marseille).

2015: Live broadcast on a swiss scientific radio show (« CQFD » RTS, <https://pages.rts.ch/la-1ere/programmes/cqfd/21-08-2015>).

2007-2012: Participation to several « fêtes de la science ».

Scientific responsibilities

Symposium/meeting: Organisation of the Institut Pasteur symposium “Mechanical forces in Biology”, June 2017

Peer-reviewing: Reviewing and co-reviewing for the following journals: Current Biology, Development, EMBO journal, Journal of Cell Science, Nature, Plos Genetics, PNAS

January 2014 to December 2016: Responsible for the Leica confocal STED SP8 and Leica SP8 microscopes in the Institute of Cell Biology (maintenance and user training).

October 2012 to December 2016: Initiating and organising the journal club of the Institute of Cell Biology, Bern (CH).

October 2006 – June 2007: Organisation of the student club “morphogenesis” in the CRI (Centre de Réflexion Interdisciplinaire, Paris), organisation of journal clubs and lectures.

Grants/Fellowships

July 2017: ERC Starting Grant (project CopSpaDD: Competition for Space in Development and Disease)

April 2016: Selection for a G5 starting package in the Institut Pasteur.

May 2013: Participation to a successful *R' equip* grant writing for the ICB Bern to buy a Leica SP8 STED

September 2013: HFSP postdoctoral fellowship

September 2012: EMBO postdoctoral long term fellowship

September 2008: PhD Fellowship, 3 years (Allocation moniteur normalien)

Awards/prizes

February 2018: Young investigator award, SBCF (French Society of Cell Biology)

June 2016: Best talk prize, Swiss Drosophila meeting 2016.

June 2014: Best talk prize, Swiss Drosophila meeting 2014.

March 2012: Best PhD award, Fondation Réaumur (regrouping different French associations for biology, including Developmental Biology, Cell Biology, Endocytosis-exocytosis, Genetics, Microscopy and photonics and Protistology). Invited speaker at the annual meeting of the society

September 2011: Best poster prize, 6th meeting Physics of living matters, Cambridge (UK).

Publications

- Merino, M. M.*, Levayer, R.* & Moreno, E. Survival of the Fittest: Essential Roles of Cell Competition in Development, Aging, and Cancer. *Trends in cell biology*, doi:10.1016/j.tcb.2016.05.009 (2016).

(*: co-first authors)

- Levayer, R. & Moreno E. Tissue crowding induces caspase dependent competition for space. *Current biology*, doi:10.1016/j.cub.2015.12.072 (2016)

- Levayer, R. & Moreno, E. How to be in a good shape? The influence of clone morphology on cell competition. *Communicative & Integrative Biology*, doi:10.1080/19420889.2015.1102806 (2016).
- Levayer, R., Hauert, B. & Moreno, E. Cell mixing induced by myc is required for competitive tissue invasion and destruction. *Nature* **524**, 476-480, doi:10.1038/nature14684 (2015).
- Levayer, R. & Lecuit, T. Oscillation and polarity of E-cadherin asymmetries control actomyosin flow patterns during morphogenesis. *Developmental cell*, **26(2)** 162-75 (2013)
- Levayer, R. & Moreno, E. Mechanisms of cell competition: Themes and variations. *The Journal of cell biology* **200**, 689-698 (2013).
- Levayer, R. Regulation of intercellular adhesion during epithelial morphogenesis. *Biologie aujourd'hui* **206**, 219-236 (2012) (*in French*).
- Levayer, R. & Lecuit, T. Biomechanical regulation of contractility: spatial control and dynamics. *Trends in cell biology* **22**, 61-81 (2012).
- Levayer, R., Pelissier-Monier, A. & Lecuit, T. Spatial regulation of Dia and Myosin-II by RhoGEF2 controls initiation of E-cadherin endocytosis during epithelial morphogenesis. *Nature cell biology* **13**, 529-540 (2011).
- Levayer, R. & Lecuit, T. Breaking down EMT. *Nature cell biology* **10**, 757-759 (2008).

Other skills

Languages: French (mother tongue), English (fluent), Italian (good working knowledge), German (basic knowledge)

Computer: Programming on *Matlab*, *Igor*, good knowledge of image processing (*ImageJ*, *Igor*, *Matlab*)

Activities

- Music (piano, choir, accordion), hiking, biking, alpine skiing, cinema, reading