# Hugues BERRY

Senior Researcher (DR1 Inria)
Inria
Batiment CEI-2
56 Blvd Niels Bohr
CS 52132
69603 Villeurbanne cedex
France

hugues.berry@inria.fr
Phone (Office): +33 4 72 43 74 90
Mobile : +33 6 70 77 63 39
http://www.inrialpes.fr/Berry/

# 1  Professionnal history

**Current professionnal status**

Position: Senior Research Scientist since January 2020 (DR1 Inria, ≈ research full professor, with tenure)
Institution: Inria, Lyon, France.

**Previous professionnal experiences**

| Start | End | Institutions | Positions and status |
|-------|-----|--------------|---------------------|
| 09/2013 | 12/2019 | Inria Lyon | Directeur de Recherche Inria (DR2) |
| 10/2009 | 09/2013 | Inria Lyon | Chargé de Recherche Inria (CR1) |
| 09/2006 | 09/2009 | Inria Saclay | Chargé de Recherche Inria (CR1) |
| 09/2004 | 08/2006 | Inria Saclay | Détachement Inria |
| 09/2000 | 08/2004 | Univ. Cergy-Pontoise, Life Sci Dept | Maître de Conférences |
| 09/1999 | 08/2000 | Univ. Cergy-Pontoise, Life Sci Dept | A.T.E.R. |
| 09/1996 | 08/1999 | Univ. Technology of Compiègne | PhD Student (MESR grant) |

**Major organizational activities**

- **Head of AIstroSight** (2023-today), a joint research team between Inria, Hospices Civils de Lyon (Lyon University Hospital), Universite Claude Bernard Lyon 1 and Theranexus, a biotech company

- **Deputy Scientific Director** of Inria for "Digital Health and Biology" (2018-2023). My mission was to advise Inria's scientific director regarding our research on the application of numerical sciences (applied mathematics, computer science, artificial intelligence) to biology or health. In particular, this consisted of : being the main contact point between the field of biology and health outside Inria and our research teams, monitoring and managing the life cycle of our research teams in the domain, helping to define our research strategy in digital biology and health and how to implement it; managing governmental research programs led or co-led by Inria.

- **INSERM committee for health technologies** (2022-today): appointed member of the 7th specialized scientific board (CSS7) of Inserm, the French National Institute for biomedical research and human health. CSS7 assists Inserm senior management for the hiring or promotion of its researchers and the evaluation of its research teams regarding health technologies.

- **Membership of Scientific (advisory) boards**

  - Scientific advisory board (SAB) of INRAE UMR PRC, Tours, France, 2024-today
  - Scientific advisory board (SAB) of Inserm U1059 Sainbiose, Saint-Etienne, France, 2024-today

- Scientific board of EBRAINS-FR, the french node of the European reserarch infrastructure (ERIC) EBRAINS, 2024-today

- Inria's scientific board (Conseil Scientifique), 2014-2016.

- **Elaboration of the PEPR Digital Health** (2021). The PEPR Digital Health is the national program of the French government to fund research in digital health for 2022-2030. Its elaboration and steering is a joint action of Inria and Inserm. I have been one of the two Inria co-supervisors of its elaboration.

- **Comité d'Expertise et Scientifique pour les Recherches, les Etudes et les Evaluations dans le domaine de la Santé** (CESREES)(2020-today) - appointed member. The mission of the CESREES is to examine the public interest, the ethical and scientific quality of requests for access to french public health data.

- **Taskforce Inria Covid-19** Chargé de mission and co-supervisor of the taskforce (2020-2021). This taskforce has coordinated the mobilization of Inria's resources in close collaboration with all ministerial and governmental initiatives to mobilize Inria's resources for the short-term fight against the virus.

- **Editorial board** of PLoS Computational Biology: Associate Editor (2018-2024) then Section Editor (Neuroscience) (2024-today)

- **Vice-Chair** of Inria's "Evaluation Committee" (Commission d'Evaluation) (Oct. 2016- Feb. 2018). The goal of Inria's Evaluation Committee is to assess the calibre of research conducted at Inria and guarantee the quality of its hiring and internal promotions.

# 2 Diplomas

**Habilitation à diriger des recherches (Habilitation Thesis)**
"Modeling Complex Biological Systems: Examples in Computational Cell Biology, Computational Neuroscience and applications to Computer Science"
Date of the defense : June 2008
Granting institution : Ecole Doctorale d'Informatique - University of Orsay Paris-Sud - Orsay
Jury: *F. Alexandre* (Project-team Cortex, Inria, Nancy, France, Rapporteur), *E. Ben Jacob* (School of Physics and Astronomy, Tel Aviv University, Israel, Rapporteur), *K. Burrage* (Computation Laboratory, University of Oxford, Oxford, UK and Institute for Molecular Biology, University of Queensland, Brisbane, Australia, Rapporteur), *H. de Jong* (Project-Team Helix, Inria Rhône-Alpes, Grenoble, France), *J. Demongeot* (TIMC-IMAG Laboratory, University Joseph Fourier, Grenoble, France), *A. Lesne* (IHES, Bures-sur-Yvette and LPTMC, Univ. P & M. Curie, Paris, France), *O. Temam* (Project-Team Alchemy, Inria Saclay-Île-de-France, France).

**Ph.D.**
"Gelification et catalyse enzymatique des transitions gel-sol de la fibronectine: Implications dans le Remodelage de la Matrice Extracellulaire et l'Invasion Tumorale."
Date of the defense of the Ph.D. : October 08, 1999
Granting institution : Université de Technologie de Compiègne
Host institution. : UMR 6022 CNRS, Génie Enzymatique et Cellulaire, Univ. Technol. Compiegne and ERRMECe, EA 1391, Université de Cergy-Pontoise.
Supervisor: Pr. V. Larreta-Garde

**Other diplomas** (Masters and above):
- Master2 ("D.E.A") in Enzyme Technology, Université de Technologie de Compiègne,1995
- Engineer Diploma in Biotechnology, Université de Technologie de Compiègne,1994

# 3 Other synergetic activites

## 3.1 Other organizational activities

- Chair of Search committees:

  - Inserm Senior Research Scientists (Jury d'admissibilité DR2), subfield CSS7 "Technologies de santé", Chair, 2024
  - Inria Senior Research Scientists (Jury d'admissibilité DR2), Vice-Chair, 2017
  - Inria Grenoble Junior Research Scientists (Jury d'admissibilité CR2) , Inria Grenoble Research Center, Chair, 2014, 2015 & 2016.

- **HCERES committees:** The HCERES is a french governmental institution tasked with assessing and analysing the quality of higher education and research in France. I have served as an expert for the HCERES evaluation of the following laboratories:

  - Physics of cells and cancer, UMR CNRS 168, Institut Curie, Paris, 2023
  - CAPS lab (Cognition, Action et Plasticité Sensorimotrice), U1093 INSERM, Dijon, 2023
  - IRSN (Institut de radioprotection et de sureté nucléaire), program ROSIRIS, Fontenay-aux-Roses, 2016.

- Activities for the Inria Lyon research center (2021-today):

  - Scientific coordinator / Chargé de mission for the interactions with Lyon's biomedical ecosystem, 2022-today
  - Scientific head of the "AI technological development initiative" (Pôle de developpement IA) between Inria and HCL (Hospices Civils de Lyon, Lyon university hospitals trust), 2021-today
  - Inria's representative at the Board of Directors (Conseil d'administration) of Lyonbiopôle, the local competitiveness cluster (Pôle de compétitivité"), 2024-today
  - Inria's representative at the Comité de la Recherche en Matiere Biomedicale et de Sante Publique (CRBSP) of the HCL, 2021-today

- Member of LyonBiopôle's GTECH (Technical Group), a group of technical experts in charge of the evaluation of projects applying for a label from the competitiveness cluster, 2023-today

- My activities as Deputy Scientific Director of Inria (2018-2023) have led me to serve in a number of committees, the main ones I list here:

  - Comité Stratégique de Pilotage for the INRAE "DigitBio" metaprogram, 2021-today
  - Coordination and Steering committees of the Bernoulli Lab, the joint laboratory between Inria and APHP (Paris university hospitals trust), 2021-2022
  - Inria representative at the board of Aviesan, the French National Alliance for Life Sciences and Health, 2019-2023
  - Comite de la Recherche en Matiere Biomedicale et de Sante Publique (CRBSP) of AP-HP, 2019-2021
  - Working Group "Catalog of observational studies relevant to health" of IReSP (Institut de Recherche en Santé Publique), 2021
  - Monitoring committee of the French Health Data Hub, also member of the "working group on data", 2018-2020
  - Conseiller Scientifique, ITMO Technologies pour la santé, 2018-2022

- Selection committee for the "Postes d'accueil de l'AP-HP", funding sabbatical in research Institutes for Paris area clinicians, 2018-2020
- Comité des Tutelles, Institut Francais de Bioinformatique (IFB), 2018-2020
- Comité des Tutelles, France Life Imaging (FLI), 2018-2022
- Comité des Tutelles, France BioImaging (FBI), 2018-2022
- Comité de Pilotage, Action de Recherche Prospective Biologie Predictive INRA (2018)
- Comité de Pilotage et de Programmation, interCPP "Santé Numérique", ANR, 2018-2020

- Member of the "Commission des thèses" of the Doctoral School "Info-Maths" (ED 512) that brings together most of the laboratories and researchers in Computer Science and Mathematics in Lyon (2017-2019).

- Member of the Steering Commitee (comité de pilotage) of GdR IMaBIO (Imagerie et Microscopie pour la BIOlogie, `http://imabio-cnrs.fr`), 2016-2018. This GdR is a federation of the french research groups ($> 120$ labs) implicated in biophotonics, super-resolution microscopy and related simulation and analysis tools.

- Representative for Inria on the Administrative Board ("Conseil d'Administration") of the RNSC ("Réseau National des Systèmes Complexes", `http://rnsc.csregistry.org`), 2016.

- Member of Inria's "Parity-Equality" Committee (2015-2016) (`parite.inria.fr/en/`). This committee ensures that parity, gender issues and equality have been taken into account within Inria activities.

- Member of several Inria's Search Committees 2012-today (hiring research scientists, jury d'admissibilite et d'admission, CR2, CR1 and DR2).

- Member of the Science Steering Committee of the Rhône-Alpes Complex Systems Institute (IXXI) 2013-2016 (`www.ixxi.fr`).

- Member of Inria's "Evaluation Committee" (2011-2015).

- Member of the SPECIF Committee, that awards each year the Gilles Kahn award, for the best French PhD in Computer Science, 2011-2014.

- Member of the Evaluation committee for the calls for funding "Systems Biology and cancer" of the "ITMO Cancer" (consortium of all the French national research institutes for research against cancer) for years 2012 to 2015.

- Member of the AERES committee for the evaluation of the UR protection radiologique de l'homme, IRSN, 2010. AERES is the National Evaluation Agency that is tasked with evaluating French research and higher education institutions and research organizations.

## 3.2 Conference Organization

- 1st Singapore-France Joint Workshop on AI in Health, held in association with the international conference MedInfo, Lyon, France, August 27-29, 2019.

- INSERM Workshop "Intracellular dynamics of molecules: analysis and models". The workshop combined a 3-day critical assessment phase (in Bordaux, France, June 24-26 2019) and a 3-day technical worskshop (in Lyon, France, July 1-3 2019). This workshop addressed a biologist audience and covered the main experimental methods to quantify the mobility and trajectories of biomolecules in living cells, with an emphasis on the quantification methods for individual trajectories and the interest of computer simulations for analysis and interpretation.

- Workshop "Dynamiques des molecules et assemblages moleculaires", Montpellier, France, 4 December 2017.

- Module "Molecular assembling and dynamics: from experimentation to modeling" at the thematic school "Functional Microscopy in Biology" (MiFoBio 2016), Seignosse, France, 30 Sep-07 Oct 2016.

- Minisymposium "Modeling Spatiotemporal Calcium Dynamics" at ECMTB 2016 (10th European Conference on Mathematical and Theoretical Biology), The University of Nottingham, UK, 11-15 July 2016.

- 2-day workshop "Molecule Trajectories in Cellular Spaces: promoting interactions between theoreticians and experimentalists", Ecole Normale Superieure de Lyon (France), November 16-17, 2015.

- Organization committee of the bis-annual CNRS thematic school "CompSysBio: Advanced Lecture Course on Computational Systems Biology", 2015 and 2017.

- Workshop "Computational Methods and Modeling of Astrocyte Physiology and Neuron-Glia Interactions", held as part of the conference OCNS (Organization for Computational Neuroscience) 2014 in Quebec, Canada, July 26-31, 2014.

- Conference "Mathematical modeling in cell biology" in Lyon, March 25-29, 2013

- Organization committee of the annual CNRS-INRA thematic school "**EIEFB**: Ecole interdisciplinaire d'échanges et de formation en biologie'', 2010-2017

- Autumn School/Conference, NeuroComp 2007 on Computational Neurosciences, 14-16 November, Paris.

## 3.3   Other committees

- Search committees (committees to hire professors / assistant professors): Since 2009, I have served in 15 search committees for Assistant Professor, Full Professor or Research Engineer positions, in fields ranging from applied mathematics (CNU section 26), computer science (section 27), biology (sections 64 & 65) to neuroscience (section 69).

- PhD / HdR committees

  - HdR (Habilitation a diriger les recherches / Habilitation thesis) :
    * M. di Volo, Univ. Claude-Bernard Lyon 1, France, March 2024 (examiner)
    * N. Glade, Univ. Grenoble-Alpes, France, November 2022 (reviewer)
    * J. Leroy-Dudal, Cergy-Pontoise University, France, February 2022 (examiner)
    * J. Roux, Universite Cote d'Azur, Nice, France, September 2019 (reviewer)
    * J.B. Masson, Sorbonne University, Pasteur Institute, Paris, France, May 2019 (reviewer)
    * S. Bottani, Univ. Paris Diderot, November 2018 (reviewer)
    * D. Martinez, Univ. de Lorraine, Nancy, March 2017 (reviewer)
    * A. Stephanou, Univ. Grenoble, December 2011 (examiner)

  - PhD juries
    * C. Bolut, Univ. Toulouse III, France, July 2024 (reviewer)
    * O. Bin Ka'b Ali, Concordia Univ., Montreal, Canada, March 2024 (reviewer)
    * M. Davy, Univ. Montpellier, France, November 2023 (examiner)
    * A. Poshtokhi, Univ. of Ulster, UK, June 2023 (reviewer)

* S. Abbara, Univ. Paris-Saclay, Pasteur Institute, France, October 2022 (reviewer)
* H. Verdier, Univ. Paris-Cité, Pasteur Institute, France, October 2022 (reviewer)
* R. Vuillaume, Univ. Bourgogne-Franche-Comté, December 2021 (reviewer)
* A. Douilet, Univ. Bretagne Ouest, September 2020 (chair)
* Y. Cui, Univ. Paris Descartes, December 2018 (reviewer)
* F. Oschmann, Technische Universität Berlin, Oct 2018 (reviewer).
* A. Mendes, Univ. P & M Curie, Paris, Sep 2017 (examiner).
* I. Djafer-Cherif, Univ. Paris-Saclay, Paris, July 2017 (reviewer).
* M. Potier, Univ. Paris-Est, Creteil, July 2017 (examiner).
* G. Rodriguez, Univ. P & M Curie, Paris, October 2016 (reviewer).
* A. Garnier, Univ. P & M Curie, Paris, December 2015 (examiner).
* N. Subramaniyam, Tampere University of Technology, Finland, December 2015 (examiner)
* Z. Chaker, Univ. Paris Descartes, December 2014 (examiner)
* V. Ady, Univ. Paris Descartes, November 2013 (reviewer)
* G. Detorakis, Univ. Nancy, October, 2013 (reviewer)
* M. Lefort, Univ. Nancy, July 04, 2012 (reviewer)
* G. Corre, Ecole Pratique des Hautes Etudes, Paris, June 27, 2012 (reviewer)
* H. Belmabrouk, Univ. Nancy, May 15, 2012 (reviewer)
* R. Martinez, Univ. Lyon, September 26, 2011 (examiner).
* L. Alecu, Uni. Nancy, June 30, 2011 (examiner)
* A. Demarez, January 31, 2011, Univ. Paris Descartes (reviewer).
* T. Girod, November 10, 2010, Univ. Nancy 1 (reviewer).
* A. Coulon, July 01 2010 Univ. Lyon 1, 2010 (examiner).
* M. Valvassori, July 10, 2009, Univ. Paris 8 (reviewer)
* M. Ambard, June 08, 2009, Univ. Nancy 1 (reviewer)
* J.-B. Rouquier, Dec. 08 2008, ENS Lyon (examiner)
* David Meunier, Oct. 19, 2007, Université Lumière Lyon 2. (examiner).

- Editiorial activities

  - Editorial Board of PLoS Computational Biology:
    * Section Editor for Neuroscience (2024-today)
    * Associate Editor (2018-2024)
    * Guest Editor (2017-2018)
  - Member of the Local Organization committee for Medinfo 2019 (https://medinfo-lyon.org/)
  - Member of the Technical Program Committee for HPCS 2013 (http://hpcs2013.cisedu.info)
  - Frequent reviewer for journals: PLoS Comput Biol, Scientific Reports, Bull Math Biol, PLoS One, Frontiers Synaptic Neuroscience, Frontiers Computational Neuroscience, J Theor Biol, Physical Biol, J Biol Physics, New J Physics...

- Expert for calls for funding or project selection:

  - NC3R (UK National center for the Replacement, refinement and reduction of animal research), 2022
  - NSERC (Natural Sciences and Engineering Research Council of Canada), 2022
  - DFG (German central research funding organisation), 2021

- Wellcome Trust grants (UK charitable foundation for health research), 2021
- Emergence Call for Proposals 2021, Sorbonne Université
- AUF (Agence Universitaire de la Francophonie), programme mobilités doctorales 2020-2021
- BBSRC (UK non-medical bioscience public funding), 2020
- NSF (US National Science Foundation), call "Early-career Program", 2016
- FNRS, Belgium, 2012-2017, 2019.
- FRC (Fond pour la Recherche sur le Cerveau) "Espoir en tête" 2016.
- Selection committee for the call "Systems Biology and cancer" of the "ITMO Cancer" from 2012 to 2015.
- COFECUB (France-Bresil cooperations), Campus France, 2011,
- DIM (Domaine d'interet majeur), Region Ile de France; 2011, 2018
- ANR (French National Research Agency) Calls "Générique" (2008, 2011, 2022) and "SysComm" (2008 & 2009),

# 4  Supervision of research activities

Together, I have (co)-supervised 4 software engineers, 3 postdoctoral researchers, 17 PhD students and 14 Master (M2) students. Unless otherwise indicated, all students listed below were full supervisions. For PhD students, I also indicate the funding source. Roughly half on them have taken jobs in private companies (that they have sometimes funded), and the other half opted for academia (doctoral, postdoctoral or permanent postions).

- Engineers / Software developers
    * **Lucas Simon** (Software developer) - 2024-2025- *MetaboGraph.* Funded by Inria via ADT "MLDD".
    * **Nicolas Simon** (Software developer) - 2022-2024- *Machine learning for drug discovery.* Funded by Inria via ADT "MLDD".
    * **Salim Sadoune** (Software developer) - 2022-2024- *LLM models for the automatic detection of negation cues and scopes in clinical reports.* Funded by Inria. Salim is now NLP engineer at Aix-Marseille University.
    * **Magali Vangkeosay** (Software developer) - 10/2012 - 09/2014 - *Development of a software for automated quantitative analysis of time-lapse microscopy movies of growing bacterial populations.* Funded by Inria via ADT "Multi*Pop". Magali is now R & D Engineer at Cosmo Tech, Lyon, France.
- Postdoctoral researchers
    * **Leonardo Trujillo** - 2024-2025-*Mathematical modelling of the impact of endocannabinoid plasticity at the network level.* Funded by ANR grant EngFlea.
    * **Maurizio de Pitta**- 2013-2017 - *Understanding the functional relevance of neuron-astrocyte interactions in brain function.* Funded by the EU by an ERCIM grant followed by an IOF Marie Curie grant "Neuron-Astro-Nets" (collaboration with N. Brunel, Univ. Chicago). Maurizio now has his own lab in Toronto, Canada.
    * **Pierre Gabriel**- 09/2011-08/2012 - *Mathematical modeling of protein aggregation and aging in E coli.* Funded by the French National Agency for Research (ANR), Project Pagdeg. Pierre is now a full professor with the Mathematics Department, University of Tours, France.
- PhD Students

* **Andrea Ducos** - 2023 - *Partial differential equation discovery for spatio-temporal simulations in cells* . ED Info-Maths Lyon. Co-supervised (20%) with Audrey Denizot and Thomas Guyet (AIstroSight)
* **Schayma Ben Marzougui-El Garrai** - 2023 - *Modelling compartmented second messanger networks in retinal growth cones.* ED Info-Maths Lyon, ANR grant (project SecNet). Co-supervised (50%) with Audrey Denizot (AIstroSight)
* **Florian Dupeuble** - 2023- *Biophysical modeling of the neurovascular unit.* ED Info-Maths Lyon, Inria grant. Co-supervised (50%) with Audrey Denizot (AIstroSight).
* **Arnaud Hubert** - 2022- *Modelling endocannabinoid-mediated synaptic plasticity and its implication in fast learning.* ED Info-Maths Lyon, ANR grant (project EngFlea).
* **Hana Sebia** - 2022- *Optimal transport for comparison of semantic graph representation of care pathways - application to patient phenotyping.* ED Info-Maths Lyon. Co-supervised (50%) with Thomas Guyet (AIstroSight).
* **Nathan Quiblier** - 2021- *Approximate Bayesian Computation for multimodal microscopy data: exploring the mobility of transcription factors in the nucleus of living cells.* ED Info-Maths Lyon, ANR grant (project ABC4M).
* **Lisa Blum-Moyse** - 2020-2023, *Modelling the integration of synaptic activity by astrocytes*, ED Info-Maths Lyon, "Contrat Doctoral Normaliens" ENS Lyon. Defense Sep. 14, 2023. Lisa currently holds a postdoctoral research position in Konstanz, Germany.
* **Audrey Denizot** - 2016-2019 : *Simulation of calcium signaling in fine astrocytic processes*, ED Info-Maths Lyon, "Contrat Doctoral Normaliens" ENS Lyon, co-supervised (50%) with Hédi Soula (CRC, Univ. P&M Curie, Paris). Defense Nov. 8, 2019. Audrey is now a postdoc in Japan, in Erik De Schutter's lab, Okinawa Institute for Science and Technology.
* **Marie Fernandez** - 2015-2017 : *Extraction and analysis of the acoustic network of social birds*, co-supervised (33%) with Hédi Soula (CRC, Univ. P&M Curie, Paris) and Clémentine Vignal (Univ. J. Monnet, Saint-Etienne). Defense April 9, 2017. ED Info-Maths Lyon, Bourse région Rhône-Alpes. Marie has started a permaculture consulting firm in southern France.
* **Alexandre Foncelle** - 2014-2017 : *Data-driven computational modelling for some of the implications of dopamine in the brain: from subcellular signalling to area networks*, Defense April 5, 2017. ED Info-Maths Lyon, ANR grant (project Dopaciumcity). Alex is now an INSERM research Engineer with Lyon Neuroscience Research Center (CRNL).
* **Alvaro Mateos Gonzalez**- 2014-2017: *Asymptotic analysis of partial differential equations arising in biological processes of anomalous diffusion.*, co-supervised (30%) with Vincent Calvez (EPI Numed) and Thomas Lepoutre (EPI Dracula), Defense: September 22, 2017. ED Info-Maths Lyon, "Contrat Doctoral Normaliens" ENS Lyon. Alvaro holds a postdoc position in Mathematics at Shangai University, China.
* **Ilya Prokin** - 2013-2016 : *Modeling and simulation of signal transduction in living cells: synaptic plasticity of basal ganglia neurons*, Defense: December 02, 2016, ED Info-Maths Lyon, Inria grant. Ilya funded the startup company Coeus Metis Labs.
* **Jules Lallouette** - 2011-2014 : *Modélisation des réponses calciques de réseaux d'astrocytes: relation entre topologie et dynamiques*, Defense: December 04, 2014. ED Info-Maths Lyon, MESR grant. Jules is now postdoc in Erik De Schutter's lab, Okinawa Institute for Science and Technology, Japan.
* **Anne-Sophie Coquel** - 2009-2012 - Co-Supervised (50%) with A. Lindner (INSERM U1001, Cochin Medical School, Paris, France). *Deciphering the molecular mechanisms underlying the role of protein aggregation in aging of E. coli.* Defense: November 16, 2012. ED Info-Maths Lyon. Inria Grant to AEN (Action d'Envergure Nationale) ColAge. Anne-Sophie is now Head of Genomics at Sanofi, Vitry-sur-Seine, France.

* **Fei Jiang** - 2006-2009 - Inria Saclay & Orsay University. Co-Supervised (40%) with M. Schoenauer (TAO, Inria, Saclay, France). *Evolution and optimization of large neural networks.*Defense: December 16, 2009. Inria Grant. Sadly, I don't have much contact with Fei anymore.

* **Benoit Siri**- 2005-2008 - Inria Saclay & Orsay University, *Topology-dynamics-learning interactions in complex bioinspired neural networks*, Defense: December 18th, 2008. Ph.D. funded by a grant by the French National Agency for Research (ANR) (Call JC/JC, Project ASTICO). Benoit is now R&D engineer at Henix, Paris.

* **Delphine Pellenc**- 2002-2005 - Université de Cergy-Pontoise- Co-Supervision (50 %) with O. Gallet, *Adsorption-induced fibronectin self-assembling: experimental characterization on hydroxyapatite and study by numerical simulation.*Defense: October 21st, 2005. MESR Grant. Delphine is now Director of STEM and Head of Physics at St Joseph's College, Reading, UK

– Master students

* **Nathan Quiblier** (Sorbonne Université, M2 Mathématiques de la Modélisation) April-September 2021, *Stochastic modelling and simulations of transcription factors in the nucleus.* Nathan started a PhD with me.

* **Lisa Blum-Moyse** (ENS Lyon, M2 Physics) February-June 2020, *Modelling the modulation of cortical on-off state switching by astrocytes.* Lisa started a PhD with me.

* **Tymofii Prokopenko** (ENS Lyon, M2 Computer Science) February-June 2019, co-supervised with Olivier Pascual (Institut NeuroMyoGene INSERM, Lyon) and Christophe Rigotti (Inria Beagle), *Classification of the activity of microglia across vigilance states: a data mining approach..*

* **Carlos Vivar-Rios** (Erasmus+ master internship) March-July 2017, co-supervised (50%) with Audrey Denizot, *Spatial stochastic simulations of calcium waves in astrocytes.* Carlos is now PhD student in A. Volterra's lab, University Lausanne, Switzerland.

* **Audrey Denizot** (Master 2 Bioscience, ENS Lyon) September-December 2015, *Multiscale simulations of Ca waves dynamics in fine astrocytic processes.* Audrey did her PhD with me.

* **Raphael Bournhonesque** (Master 2 Computer Science, ENS Lyon) February-June 2015, *Role of glutamate transporter diffusion in glutamate clearance.* Raphael is now a datascientist with Wuha.

* **Alvaro Mateos Gonzalez** (Master 2 Mathematics, ENS Lyon) March-June 2014, co-supervised (30%) with Vincent Calvez (EPI Numed) *Anomalous subdiffusion equations as diffusion limits to integro PDEs with age structure.* Alvaro started a PhD with me (co-supervision).

* **Osama Khalil** (Master in Medicine, Univ. of Cairo, Egypt) - Feb-May - 2013 - *Computational systems biology of signal transduction in living cells: synaptic plasticity of striatum neurons.* EGIDE grant. After a PhD at Ohio State University, USA, Osama is now a postdoc at the Mathematics department of the University of Utah.

* **Amanda Lo Van** (Master 2 IADE, Lyon, now a PhD Student, Carmen, Lyon, France) - Feb-June 2013 - *Individual-based modeling of simple genetic circuits.* After a postdoc at the Italian Institute for Technology, Genova, Italy, Amanda is now an assistant professor at Insa Lyon, France.

* **Jean-Marie Gomes** (Master 2, Computer Science, ENS Lyon) - Feb-June - 2011 - *The bidirectional response of cortico-striatal synapses to 2-arachidonyl-glycerol.* Jean-Marie did his PhD with A. Destexhe's lab, Gif-sur-Yvette, France.

* **Jules Lallouette** (Master 2 IADE, Lyon) - Feb-June 2011 : *Transport in complex networks: the case of mixed neuron/glial cell networks.* Jules did his PhD with me.

* **Zayna Chaker** (Master 2 AIV, Univ. Paris 5 Descartes), April-July 2010 - *Protein aggregation underlying bacterial aging : Computer simulations.* Zayna is now a postdoc at Biozentrum, Univ. Basel, Switzerland.

* **Edouard Garnier de Labareyre** (Ecole polytechnique, Internship, co-supervised (50%) with O. Temam, Alchemy, Inria Saclay) - April-July 2008 - *Emergence of computation and abstraction functions on biological neural networks.* Edouard is founder and CTO of PPE analytics.

* **Geoffrey Caron-Lormier** (Master 2) - September 2001-July 2002 - Université de Cergy-Pontoise, *Biomathematics of the early steps of integrin signaling pathway: FAK and Src auto- and co-activation.* Geoffrey is a researcher at Rothamsted Research, UK

# 5 Grants / Management

I distinguish below between the research projects I am supervising or have supervised from those for which I have been a partner, but not supervisor.

- Grants as supervisor

  - **ABC4M**, 2020-, grant ANR-20-CE45-0023-01, Approximate Bayesian computation-driven multimodal microscopy to explore the nuclear mobility of transcription factors, a project funded by the French National Agency for Research (ANR), Call "AAP2020".
    * We combine computer simulations and Approximate Bayesian computation with simultaneous multiple microscopy methods (FCS and spt-PALM) to quantify the way transcription factors explore the nucleus to find their binding sites
    * I am supervising the project. Other participants are Institut Langevin, ESPCI, Paris (I. Izeddin), Phlam laboratory, Lille (L. Héliot) and Univ. Berlkeley, CA, USA (X. Darzacq).
    * Total amount funded: 565 k€.

  - **Neuron-Astro-Nets**: 2013-2017, Marie-Curie International Outgoing Fellowship (IOF) grant from EU FP7.
    * This project aimed at developing a new model of synaptic plasticity that takes into account astrocyte signaling, its extension to astrocytes-synapse biochemical interactions in ensembles of synapses enwrapped by the same astrocyte and, eventually, to the firing of a single neuron or networks.
    * I was coordinator of the project. Nicolas Brunel (University of Chicago, Dept Statistics and Neurobiology) was the other participant.
    * The project has funded Maurizio De Pittá's postdoc for 4 years (June 2013- May 2017). M. De Pittá first spent one year in Beagle, Lyon funded by an EU ERCIM grant (06/2013-05/2014) then two years in N. Brunel's group in Chicago (06/2014-05/2016) and one year back in Beagle in Lyon (06/2016-05/2017). The IOF grant funded the last three years.
    * Total amount funded: 270 k€.

  - **MultiPop**: 2012-2014, an ADT funded by Inria's Technological Development Department D2T.
    * The objective was to develop a new software for automated quantification of bacterial cells in microscopy movies, in collaboration with INSERM U1001 and Paris 5 MAP (Applied Mathematics) Labs. The mathematical and methodological aspects at the basis of the software had already been laid out during A-S Coquel's PhD (defended in 2012, co-supervised with A. Lindner, INSERM U1001).
    * Total amount funded : 200 k€.

  - **Astrocytic regulation of neuronal network activity**: 2012-2013, a Research Networks Program of the High Council for Scientific and Technological Cooperation between France-Israel, with groups from Tel Aviv University.
    * The specific objectives of this project were to determine the properties of astrocytic calcium wave propagation and to reveal how astrocyte signals dynamically affect synaptic information transfer, thus regulating neuronal network activity. To this aim, we combined theoretical and experimental investigations of small neuron-glial networks.
    * I was coordinator of the project for the French side and supervised the modeling aspects. The coordinator for the Israeli group was Pr. Y. Hanein (Tel Aviv University Institute for Nanoscience and Nanotechnology, `nano.tau.ac.il/hanein`), who was responsible for

the experimental parts. The other partner was Pr. E. Ben-Jacob (School of Physics and Astronomy, Tel Aviv University, `tamar.tau.ac.il/~eshel/EBJG/`). The project also gathered 4 PhD or Master students in Tel Aviv and Lyon.

  * Total amount funded : 160 k€.

– **ColAge**: 2008-2012, an Inria AEN ("Action d'Envergure Nationale") project on modeling and simulation of systems biology.

  * We have searched for natural and engineering solutions to the control of bacterial growth and aging using both systems biology and synthetic biology approaches. Our main strategy was to leverage synergies resulting from day-to-day collaborations between computer scientists and cell biologists
  * I have supervised the project. Other participants were INSERM U1001 Paris, LAPM Lab CNRS Grenoble, EPI Ibis Grenoble, EPI Biocore Sophia and EPI Contraintes Rocquencourt.
  * Over the 4 years, ColAge has gathered more than 20 members (14 permanent researchers, 3 postdocs and 4 PhD students), led directly to the publications of $> 25$ peer-reviewed articles and was at the origin of 3 closely related research projects funded by the ANR or Inria.
  * website (incl. publication list): `colage.saclay.inria.fr`
  * Total amount funded: 626 k€.

– **ASTICO**, 2005-2008, grant ANR-05-JCJC-0128, Apprentissage dans les SysTemes bIologiques COmplexes / Learning in complex biological systems, a project funded by the French National Agency for Research (ANR), Call "Jeunes Chercheurs" / Young Researchers.

  * Our goal was to investigate how the structure complexity in complex biological neural networks conditions their functional capacities, and more specifically, their learning characteristics.
  * I have supervised this project. Other participants were Non Linear Institute, UMR 6618 CNRS, Nice; ANIM, U742 INSERM/UPMC, Paris and ETIS, UMR 8051 CNRS, Cergy-Pontoise (total 5 permanent researchers).
  * The project funded B. Siri's PhD and directly led to the publications of 7 peer-reviewed articles (journals and conferences).
  * Total amount funded: 110 k€.

- Grants as partner

  – "SecNet" (Spatio-temporal dynamics of second messenger networks), 2023- ANR-22-CE16-0034-02, Call AAPG ANR 2022. Supervisor: X. Nicol (Vision Institute, Paris). Total amount funded: 533 k€.

  – "EngFlea" (Engram of fast learning in the striatum), 2022- grant ANR-21-CE16-0022-02, Call AAPG ANR 2021. Supervisor: L. Venance (CIRB, Collège de France, Paris). Total amount funded: 630 k€.

  – "Dallish" (Data Assimilation and Lattice LIght SHeet imaging for endocytosis/exocytosis pathway modeling in the whole cell), Call AAPG ANR 2016 (2016-2020). Supervisor: C. Kervrann (Inria Rennes). Other participants: J. Salamero (Institute Curie, Paris) and B. Laroche (INRA, Jouy-en-Josas). Total amount funded: 440 k€.

  – "Dopaciumcity" (Dopamine modulation of calcium influx underlying synaptic plasticity): ANR-14-NEUC-0003, a 4-year project (2014-2018) funded by a grant from the ANR-NSF-NIH Call for French-US Projects in Computational Neuroscience. With L. Venance, College de France, CIRB, CNRS/UMR 7241 - INSERM U1050, Paris, France and Kim Blackwell,

Krasnow Institute of Advanced Studies, George Mason University, Fairfax, VA, USA. Supervisor: L. Venance (for France) and K.L. Blackwell (for US) . Total amount funded: 880 k€.

– "PAGDEG" (Causes and consequences of protein aggregation in cellular degeneration): grant ANR-09-PIRI-0030, a three-year project (2009-2012) funded by the French National Agency for Research (ANR), Call "PIRIBIO" - Programme interdisciplinaire de recherches sur les systèmes moléculaires et cellulaires, et d'innovation biomédicale. Supervisor: A. Lindner (INSERM, Paris) ; Other participants: Y. Chen (ENS Paris), L. Moisan (Univ. Paris 5). Total amount funded: 450 k€.

– "NeoBG" (towards a biologically realistic theory of reinforcement learning), 2011-2012, Appel Projets exploratoires pluridisciplinaires inter-instituts (PEPII) CNRS - Supervisor : B. Delord (Univ. P & M Curie, Paris). With Ph. Faure and L. Venance (College de France, Paris). Total amount funded : 24 k€.

– "RASMOT": A one year (2010) research project funded by the call "Programme interdisciplinaire CNRS Neuro-IC : Neurosciences et neuroinformatique computationnelle". Supervisor: E. Guigon (ISIR, CNRS, Univ. P&M Curie Paris). Total amount funded : 24 k€.

– "AMYBIA" (Aggregating Myriads of Bio-Inspired Agents); a two-year project (2008-2009) funded by an Inria ARC (Collaborative Research Initiative). Supervisor: N. Fatès (Project-Team MAIA, Inria Nancy-Lorraine); Other participants: B. Girau (Project-Team Cortex, Inria Nancy-Lorraine). Total amount funded : 24 k€.

– "MACACC" (Modeling cortical activity and analysis of the cerebral code); a two-year project (2008-2009) funded by an Inria ARC (Collaborative Research Initiative). Supervisor: B. Cessac (Institut Non-Linéaire de Nice and Project-Team Odyssee, Inria Nice); Other participants: EPI Odyssee, Inria Nice), Cortex, Inria Nancy, Mediterranean Institute for Cognitive Neuroscience, Marseille, Lab. J.A. Dieudonné, Lab. Neurobiology, Univ. Nice. Total amount funded: 66 k€.

# 6 Prizes and awards

- Recipient of the "RIPEC C3" individual bonus for both pedagogical investment, scientific activity, and tasks of general interest, 2023-2025.

- Elected Full Member, Sigma Xi: The Scientific Research Honor Society, 2021-2022

- Conference Fellowship of the United Engineering Foundation (Mount Vernon, VA, USA), 1998.

# 7 Teaching

Almost all my teaching dates back from my years as a PhD student in Univ Technology Compiegne (1996-1999) and an assistant professor in the University of Cergy Pontoise (1999-2004). Since my hiring at Inria, I have been teaching approx. 10 hours per year at Master levels (at INSA Lyon and ENS Lyon). The topics of these lectures concerns diffusion and reaction in intracellular environments.

- Total: 1000 hours (eq. TD)

- Level: from L2 to M2

- Main Subjects:

  – Computer programming basics for biologists (L2)
  – Biochemistry/Metabolism (L2)

- Enzyme kinetics (L2 & L3)
- Biomathematics and modeling (L3)
- Biophysics: Neutron and light scattering (M1)
- Protein/Ligand interactions (M1)
- Diffusion and reaction in intracellular environments (M2)

# 8    Dissemination of scientific knowledge

- "Le mouvement est devenu massif," an interview to the Fench journal L'Usine Nouvelle, Special Edition "A year of simulation", number 3608, April 25, 2019.

- Interview for a news of the Journal "Biotechniques"

- "Alan Turing aurait 100 ans : témoignage", a 2 min interview on Turing's 1952 paper on chemical morphogenesis (in french).

- "Alan Turing : l'étrange origine des formes" (short paper for A. Turing centenary), with C. Castro, on Inria's web site, 2012

- "Du chaos dans les neurones" (chaos in neurons), with B. Cessac, *Pour La Science*, Nov. 2009, 385:108-115 (in french). Also an online article for the *)i(nterstices* web journal

- "Quand les bactéries se mêlent du calcul des ordinateurs..." (about bacteria and computer calculations) : a short vulgarization text plus a longer podcast on the *)i(nterstices* web journal

- "Alchimistes de l'informatique" (computer alchemists), *La Recherche*, may 2008.

- "Why computers are like the weather", *NewScientist*, July 2005. A comment on our paper : Berry, Graia Perez and Temam (2006) Chaos in computer performance. *CHAOS*, 16:013110.

# 9    Technology development : software or other realization

## 9.1    Software development

Between 2012-2016, I have supervised the development of a software called "FluoBacTracker" as part of the Inria-funded (ADT) project "Multipop". FluoBacTracker was an integrated software tool to identify and track bacterial cells and their lineages throughout microscopy "movies" (time lapse microscopy). I have been supervisor of the ADT and head of the Steering Committee. I supervised and ratified all the design and architectural choices. Moreover I have served as a day-to-day technical support to the developers for basic questions on the biological aspects. The development of FluoBacTracker has been crucial for the PhD of Anne-Sophie Coquel but the software has also been used by a couple of other academic labs.

## 9.2    Technology transfer

I am co-owner of Patent FR2937762, together with O. Temam and S. Yehia. The patent is an extension of our results published in the conference HPCA 2009 (Yehia et al., 2009) on the conception of specialized hardware accelerators to speedup the execution of parts (loops) of a program. This patent is co-owned by INRIA and Thalès (where S. Yehia was working at the time, he is now with Intel Portland) and registered in France only (Thalès decided not to extend it to international in 2011).
My contribution has mainly consisted in writing a C++ code to fuse the individual circuits into a single compound one that minimizes the total cost using evolutionary strategy.

# 10 Publications

## 10.1 Articles & Conference Proceedings

| Article type | # articles |
|---|---|
| Books | 2 |
| Book Chapters | 10 |
| Peer-Reviewed Journals | 61 |
| Peer-Reviewed Internatl. Conferences | 25 |
| Peer-Reviewed Workshops & Abstracts | 12 |
| Patents | 1 |

**A note on the order of the authors in my field**: The first or the first two authors are usually the ones who produced the results ("junior authors"), while the last or two last ones are the "leading" supervisors. However, when publishing a collaboration work between experimentalists and theoreticians, determining the authors' positions is a bit more delicate. There is no real "leading" author because both approaches were equally important for getting the results published. That is why we are often second or second last author.

**Hugues BERRY**

# Complete Publication List

*Almost all the articles below can be downloaded at*
*http://www.inrialpes.fr/Berry/PublisHB.html*

## Preprints / submitted

[1] Sadoune, S., Richard, A., Talbot, F., Guyet, T., Boussel, L. and Berry, H., (2024). Automatic analysis of negation cues and scopes for medical texts in french using language models. Submitted, URL `https://hal.science/hal-04564718`.

[2] Quiblier, N., Rye, J.-M., Leclerc, P., Truong, H., Hannou, A., Héliot, L. and Berry, H., (2024). Enhancing Fluorescence Correlation Spectroscopy with Machine Learning for Advanced Analysis of Anomalous Diffusion. Submitted, URL `https://inria.hal.science/hal-04650578`.

## Publications in Peer-Reviewed Journals

[1] Blum Moyse, L. and Berry, H., (2024). A Coupled Neural Field Model for the Standard Consolidation Theory. *Journal of Theoretical Biology*, **588**:111818. URL `https://inria.hal.science/hal-04527872`.

[2] Mouttou, A., Bremaud, E., Noero, J., Dibsy, R., Arone, C., Mak, J., Muriaux, D., Berry, H. and Favard, C., (2023). Quantification of membrane binding and diffusion using fluorescence correlation spectroscopy diffusion laws. *Biophysical Journal*, **122**(11):2216–2229. `https://www.biorxiv.org/content/10.1101/2022.09.12.507540v1`, URL `https://doi.org/10.1016/j.bpj.2023.01.006`.

[3] Dembitskaya, Y., Perez, S., Piette, C., Berry, H., Magistretti, P. J. and Venance, L., (2022). Lactate supply overtakes glucose when neural computational and cognitive loads scale up. *Proceedings of the National Academy of Sciences of the U.S.A.*, **119**(47):e2212004119. `https://www.biorxiv.org/content/early/2022/05/23/2022.05.23.493059`, URL `https://www.pnas.org/doi/epdf/10.1073/pnas.2212004119`.

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[60] Berry, H., Débat, H. and Larreta Garde, V., (1999). Oxygen concentration determines regiospecificity in soybean lipoxygenase-1 reaction via a branched kinetic scheme. *Journal of Biological Chemistry*, **273**:2769–2776.

[61] Berry, H., Débat, H. and Larreta Garde, V., (1997). Excess substrate inhibition of soybean lipoxygenase-1 is mainly oxygen-dependent. *FEBS Letters*, **408**:324–326.

# Publications in Peer-Reviewed International Conference Proceedings

[1] Denizot, A., Calì, C., Berry, H. and De Schutter, E., September (2021). Stochastic Spatially-Extended Simulations Predict the Effect of ER Distribution on Astrocytic Microdomain Ca2+ Activity. In *NANOCOM 2021: Eighth Annual ACM International Conference on Nanoscale Computing and Communication*, pages 1–5. ACM, New York, NY, United States. URL `https://hal.archives-ouvertes.fr/hal-03590777`.

[2] Badoual, A., Arizono, M., Denizot, A., Ducros, M., Berry, H., Valentin Nägerl, U. and Kervrann, C., April (2021). Simulation of Astrocytic Calcium Dynamics in Lattice Light Sheet Microscopy Images. In *IEEE International Symposium on Biomedical Imaging*. Nice, France. URL `https://hal.inria.fr/hal-03106797`.

[3] Lallouette, J. and Berry, H., (2013). Topology drives calcium wave propagation in 3d astrocyte networks. In Gilbert, T., Kirkilionis, M. and Nicolis, G., eds., *Proceedings of the European Conference on Complex Systems 2012*, Springer Proceedings in Complexity, pages 453–463. Springer International Publishing.

[4] Cui, Y., Paille, V., Delord, B., Genet, S., Fino, E., Venance, L. and Berry, H., July (2013). Endocannabinoids mediate spike-timing dependent potentiation and depression: a model-based experimental approach. In *22nd Annual Computational Neuroscience Meeting (CNS'2013), BMC Neuroscience 14(Suppl 1):O1*. Paris. Preprint HAL: inserm-00842298.

[5] Hashmi, A., Berry, H., Temam, O. and Lipasti, M., June (2011). Automatic abstraction and fault tolerance in cortical microarchitectures. In *38th ACM/IEEE International Symposium on Computer Architecture, ISCA 2011*. San Jose, CA, USA.

[6] Auras, D., Girbal, S., Berry, H., Temam, O. and Yehia, S., 0ct. (2010). Memory interface for multi-purpose multi-stream accelerators. In *International Conference on Compilers, Architectures and Synthesis for Embedded Systems, CASES 2010*. Scottsdale, AZ, USA.

[7] Auras, D., Girbal, S., Berry, H., Temam, O. and Yehia, S., June (2010). CMA: Chip multi-accelerator. In *8th IEEE Symposium on Application Specific Processors, SASP 2010*. Anaheim, CA, USA.

[8] Vlassopoulos, N., Fates, N., Berry, H. and Girau, B., June (2010). An FPGA design for the stochastic greenberg-hastings cellular automata. In Smari, W., ed., *The 2010 International Conference on High Performance Computing & Simulation, HPCS 2010*, pages 565–574. IEEE, Caen, France.

[9] Fates, N. and Berry, H., September (2010). Critical phenomena in a discrete stochastic reaction-diffusion medium. In Peper, F., ed., *Fourth International Workshop on Natural Computing, IWC 2009*, volume 2 of *Proceedings in Information and Communications Technology*, pages 141–148. Springer, Himeji, Japan. ISSN: 1867-2914.

[10] Jiang, F., Berry, H. and Schoenauer, M., June (2009). The impact of network topology on self-organizing maps. In *World Summit on Genetic and Evolutionary Computation, GECS-2009*. Shangai, China.

[11] Yehia, S., Girbal, S., Berry, H. and Temam, O., February (2009). Reconciling specialization and flexibility through compound circuits. In *15th International Symposium on High-Performance Computer Architecture, HPCA*. Raleigh, North Carolina.

[12] Jiang, F., Berry, H. and Schoenauer, M., September (2008). Supervised and unsupervised evolutionary learning of echo state networks. In *10th International Conference on Parallel Problem Solving From Nature, PPSN-2008*. Dortmund, Germany.

[13] Jiang, F., Berry, H. and Schoenauer, M., July (2008). Unsupervised learning of echo state networks: Balancing the double pole. In *Genetic and Evolutionary Computation Conference, GECCO-2008*. Atlanta, GA, USA. 2-page abstract.

[14] Jiang, F., Berry, H. and Schoenauer, M., October (2007). Optimizing the topology of complex neural networks. In *European Conference on Complex Systems, ECCS 2007*. Dresden, Germany.

[15] Siri, B., Berry, H., Cessac, B., Delord, B. and Quoy, M., October (2007). Local learning rules and bifurcations in the global dynamics of random recurrent neural networks. In *European Conference on Complex Systems, ECCS 2007*. Dresden, Germany.

[16] Siri, B., Berry, H., Cessac, B., Delord, B. and Quoy, M., June (2006). Topological and dynamical structures induced by hebbian learning in random neural networks. In *International Conference on Complex Systems, ICCS 2006*. Boston, MA, USA.

[17] Gracia Pérez, D., Berry, H. and Temam, O., December (2005). Budgeted region sampling (beers): Wisely allocating simulated instructions for a better accuracy/speed/applicability tradeoff. In *5th IEEE International Symposium on Signal Processing and Information Technology*. Athens, Greece.

[18] Berry, H. and Temam, O., (2005). Characterizing self-developing biological neural networks: A first step towards their application to computing systems. In *Proc. International Work-conference on Artifical Neural Networks, IWANN, June 2005, Barcelona, Spain*, Lecture Notes Computer Science, **3512**, 306–317.
e-print: arXiv:q-bio.NC/0505021; Hal inria: inria-00000024.

[19] Pellenc, D., Gallet, O. and Berry, H., July (2005). How do surface- and neighbour-induced conformational changes affect the morphological properties of diffusion-aggregation driven surface-assemblies? In *IMACS World Congress 2005 for Scientific Computation, Applied Mathematics and Simulation*. Paris, France.

[20] Pellenc, D., Gallet, O. and Berry, H., July (2005). Two-dimensional protein aggregation: Effect of surface- and neighbour-induced conformational changes. In *European Conference on Mathematical and Theoretical Biology (ECMTB)*. Dresden, Germany.

[21] Caron-Lormier, G. and Berry, H., August (2003). Amplification and oscillations in the fak/src kinase system during integrin signaling. In *International Conference on Mathematical Biology 2003*. Dundee, Scotland.

[22] Berry, H., Pauthe, E., Gallet, O. and Larreta Garde, V., (1998). Proteolysis of aggregated fibronectin: a model for in vivo matrix degradation. In *Proc. Enzyme Engineering XIV, Oct. 1997, Beijing, China*, Annals of the New York Academy of Sciences, **864**, 198–202.
**This paper won the Conference Fellowship, awarded by the United Engineering Foundation, Mount Vernon, VA, USA**.

[23] Pauthe, E., Dauchez, M., Berry, H., Berjot, M., Monti, J., Alix, A. and Larreta-Garde, V., (1998). Enzymatic and structural approaches of thermolysin mechanism in glycerol containing media. In *Proc. Enzyme Engineering XIV, Oct. 1997, Beijing, China*, Annals of the New York Academy of Sciences, **864**, 458–462.

[24] Berry, H., Debat, H. and Larreta Garde, V., (1996). A mechanistic and kinetic approach to the regulation by oxygen of soybean lipoxygenase-1 catalysis. In *Proc. Enzyme Engineering XIV, Oct. 1997, Beijing, China*, Annals of the New York Academy of Sciences, **864**, 366-370.

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[25] Berry, H., Lambert, C. and Larreta Garde, V., (1996). Influence of environment modifications on enzyme catalysis: Comparison of macromolecular and molecular effects of cosolvents on lipoxygenase reactions. In *Proc. Enzyme Engineering XIII, Oct. 1995, San Diego, CA, USA*, Annals of the New York Academy of Sciences, **799**, 290–297.

# Books

[1] Abou, B. and Berry, H., eds., (2019). *Sexe et genre: De la biologie a la sociologie*. Editions Materiologiques, Paris.

[2] De Pitta, M. and Berry, H., eds., (2019). *Computational Glioscience*. Springer Series in Computational Neuroscience. Springer, Cham. URL `https://link.springer.com/book/10.1007%2F978-3-030-00817-8`.

# Book Chapters

[1] Berry, H. and Watier, L., March (2022). Pandémie de Covid-19. L'aide de l'IA et du numérique. In NORDLINGER, B., VILLANI, C. and de FRESNOYE, O., eds., *Médecine et intelligence artificielle*. CNRS. URL `https://inria.hal.science/hal-04165597`.

[2] Berry, H., January (2023). Les utilisations de l'IA pour l'hôpital et la santé publique : données nécessaires, applications et obstacles potentiels. In Paul, C. and Le Métayer, D., eds., *Maîtriser l'IA au service de l'action publique: Une responsabilité individuelle et collective*, Collection : Au fil du débat, chapter 5, pages 83–94. Berger-Levrault. URL `https://boutique.berger-levrault.fr/maitriser-l-ia-au-service-de-l-action-publique.html`.

[3] Denizot, A., Berry, H. and Venugopal, S., (2020). *Intracellular Calcium Signals in Astrocytes, Computational Modeling of*, pages 1–12. Springer New York, New York, NY. `https://hal.inria.fr/hal-02419317`, URL `https://doi.org/10.1007/978-1-4614-7320-6_100693-1`.

[4] De Pitta, M. and Berry, H., (2019). A neuron-glial perspective for computational neuroscience. In De Pitta, M. and Berry, H., eds., *Computational Glioscience*, pages 3–35. Springer. URL `https://hal.inria.fr/hal-01995849v1`.

[5] De Pitta, M., Ben-Jacob, E. and Berry, H., (2019). G protein-coupled receptor-mediated calcium signaling in astrocytes. In De Pitta, M. and Berry, H., eds., *Computational Glioscience*, pages 115–150. Springer. URL `https://hal.inria.fr/hal-01995850v1`.

[6] Lallouette, J., De Pitta, M. and Berry, H., (2019). Astrocyte networks and intercellular calcium propagation. In De Pitta, M. and Berry, H.,

eds., *Computational Glioscience*, pages 177–210. Springer. URL `https://hal.inria.fr/hal-01995852v1`.

[7] Caré, B., LoVan, A., Berry, H. and Soula, H., (2015). Signalisation sous contraintes spatiales. consequences sur les conditions de stabilité et de bifurcation. In Glade, N. and Stephanou, A., eds., *Le vivant critique et chaotique*, volume 1, chapter 6, pages 199–222. Editions Matériologiques, Paris.

[8] Berry, H., (2013). Modélisation de la diffusion-réaction dans les milieux intracellulaires encombrés. In Glade, N. and Stephanou, A., eds., *Le vivant discret et continu*, chapter 9, pages 241–266. Editions Matériologiques, Paris.

[9] Berry, H. and Beslon, G., (2013). De la modélisation comme poésie. la modélisation de systèmes biologiques complexes vue par deux modélisateurs. In Varenne, F. and Silberstein, M., eds., *Modéliser & simuler. Epistémologies et pratiques de la modélisation et de la simulation*, volume 1, chapter 11, pages 327–390. Editions Matériologiques, Paris.

[10] Berry, H., (2008). Nonequilibrium phase transition in scattered cell communities coupled by auto/paracrine-like signalling. In Pollack, G. and Chin, W.-C., eds., *Phase transitions in cell biology*, pages 23–41. Springer Verlag.

# Publications in Workshop Proceedings and Abstracts

[1] Venance, L., Cui, Y., Paille, V., Delord, B., Genet, S. and Berry, H., (2011). Sub-second induction unveils a switch from nmda- to endocannabinoid-ltp (abstract). Society for Neuroscience, Washington, DC. Program No. 348.04. 2011 Neuroscience Meeting Planner. Online.

[2] De Pitta, M., Volman, V., Berry, H. and Ben-Jacob, E., (2011). Astrocyte regulation of long-term synaptic plasticity (abstract). Society for Neuroscience, Washington, DC. Program No. 663.20. 2011 Neuroscience Meeting Planner. Online.

[3] Berry, A., De Pitta, M., Volman, V. and Ben-Jacob, E., (2011). Astrocyte regulation of presynaptic plasticity (abstract). Society for Neuroscience, Washington, DC. Program No. 663.10. 2011 Neuroscience Meeting Planner. Online.

[4] Delord, B., Naudé, J., Paz, J. and Berry, H. ., February (2011). Modeling the effects of intrinsic plasticity on rate coding (abstract). In *Computational and Systems Neuroscience (COSYNE) 2011*. Abstract.

[5] Goldberg, M., De Pittà, M., Volman, V., Berry, H. and Ben-Jacob, E., (2010). On the determinants of calcium wave propagation distance in astrocyte networks: nonlinear gap junctions and oscillatory modes (abstract). In *40th annual meeting of the Society for Neuroscience*. Society for Neuroscience, San Diego, CA. Program No. 552.22. 2010 Neuroscience Meeting Planner. Online.

[6] Girbal, S., Yehia, S., Berry, H. and Temam, O., January (2010). Stream and memory hierarchy design for multi-purpose accelerators. In *1st Workshop on SoC Architecture, Accelerators and Workloads (SAW-1)*. Bangalore, India.

[7] Hashmi, A., Berry, H., Temam, O. and Lipasti, M., December (2009). Leveraging progress in neurobiology for computing systems. In *1st Workshop on New Directions in Computer Architecture (NDCA-1)*. New-York, New-York, USA.

[8] Naudé, J., Genet, S., Berry, H., Paz, J. and Delord, B., 8-11 October (2008). A formalization of the computational impact of intrinsic plasticity. In *Proceedings of NeuroComp'08*, pages 19–26. Marseille, France.

[9] Genet, S., Delord, B., Sabarly, L., Guigon, E. and Berry, H., 23-24 October (2006). On the propagation of Ca-dependent plateau and valley potentials in cerebellar Purkinje cells and how they drive the cell output. In *Proceedings of NeuroComp'06*, pages 167–170. Pont-à-Mousson, France.

[10] Siri, B., Berry, H., Cessac, B., Delord, B., Quoy, M. and Temam, O., 23-24 October (2006). Learning-induced topological effects on dynamics in neural networks. In *Proceedings of NeuroComp'06*, pages 206–209. Pont-à-Mousson, France.

[11] Berry, H. and Quoy, M., September (2005). Structure and dynamics of random recurrent neural networks. In *Active agents and their environments as dynamical systems*, workshop held during the VIIIth European Conference on Artificial Life (ECAL). University of Kent, Canterbury, Kent (UK).

[12] Gracia Pérez, D., Berry, H. and Temam, O., June (2005). Edca: A new clustering approach for sampling. In *MoBS: Workshop on Modeling, Benchmarking, and Simulation*. Madison, Wisconsin, USA.

# Patents

[1] Yehia, S., Temam, O. and Berry, H., April (2010). Procede pour la conception d'accelerateurs. Patent number FR2937762, Institut National de la Propriete Industrielle, France.

# Invited Conferences.

**N.B.: Talks prefixed with an asterisk ∗ are presentations related to my organizational activities, not to my own research work.**

[1] June (2024). 48e colloque annuel de l'AFSTAL, Lille.

[2] May (2024). Seminaire Emerg'in + LiPh4SAS, Tours.

[3] March (2023). 4th "Synaptic Microenvironment" Mini-symposium and Workshop, Solden, Austria.

[4] November (2023). Workshop "Inferring Neural Networks from Electrophysiological and Functional Imaging", Centre de Recherches Mathématiques, Montreal, Canada.

[5] November (2023). Journée 3R 2023, Lyon.

[6] * October (2023). Workshop IIT Dehli - Inria, New Dehli, India.

[7] July (2023). Colloque GDR ImaBio 2023.

[8] * June (2023). 6emes Journees Franco-Internationales d'Oncologie.

[9] * May (2023). Centre Leon Berard, Lyon.

[10] March (2023). 3rd 'Synaptic Microenvironment' Mini-symposium and Workshop, Solden, Austria.

[11] * December (2022). Table ronde, Cité des sciences et de l'Industrie de La Villette, Paris.

[12] December (2022). Master Neuroscience of the University of Lyon 1.

[13] * October (2022). Master AI4OneHealth, University of Grenoble-Alpes.

[14] July (2022). CNS 2022, Workshop "Emerging Perspectives and Models for Neuron-Glial Interactions", Melbourne, Australia.

[15] July (2022). CNS 2022, "Tutorial Models of Neuron-Glia Interactions", Melbourne, Australia.

[16] June (2022). I-Stem Institute.

[17] June (2022). Centre de Recheche en Neurosciences de Lyon, CRNL.

[18] * May (2022). Ecole Nationale Supérieure de la Police.

[19] * May (2022). Groupement des Animaleries de Grenoble.

[20] * April (2022). 6th scientific day on technological innovation.

[21] * November (2021). Presentation to "Journée scientifique 2021" of the EDISS Doctoral School, Lyon.

[22] * November (2021). Presentation to "Journée enjeu Santé Globale et Bio-Ingénierie", Insa Lyon.

[23] March (2021). Workshop "Spatio-temporal encoding and decoding in cell signaling ", Paris.

[24] * February (2021). Presentation to the bi-academic workgroup on AI and Health (French Academy of Sciences and Academy of Medicine).

[25] * January (2021). Interview with the French Comite National Pilote d'Ethique du Numerique.

[26] * November (2020). 2nd Japan-France-Germany trilateral symposium on AI. fully on-line.

[27] November (2020). 9th annual conference of the Groupement de Recherche "GPCR-PhysioMed". fully on-line.

[28] * December (2019). Aviesan Meeting. Brussels, Belgium.

[29] October (2019). Action nationale de formation du cnrs, measurement of molecular dynamics in living cells. Lille, France.

[30] July (2019). Inserm workshop 250, Intracellular dynamics of molecules: analysis and models. Bordeauw, France.

[31] June (2019). Dynamical Systems and Applications to Biology, CIMPA school. Dhaka, Bangladesh. 10 hours of classes.

[32] April (2019). Random Walks and Intracellular Transport, School of Mathematics, University of Manchester. Manchester, UK.

[33] April (2019). Tampere University of Technology. Tampere, Finland.

[34] * March (2019). 2019 French-American Innovation Day (FAID2019). Houston, Texas, USA.

[35] November (2018). Journees de l'ITMO Technologies pour la sante, Tech-San. Strasbourg, France.

[36] May (2018). Modelisation stochastique en Biologie. Tours, France.

[37] * June (2018). Singapore – France AI workshop. Singapore.

[38] * December (2017). Your carreer day, I2BC. Saclay, France.

[39] December (2017). Dynamiques des molecules et assemblages moleculaires. Montpellier, France.

[40] June (2017). Imaging the cell. Rennes, France.

[41] March (2017). Seminaires de l'Institut du Fer a Moulin. Paris, France.

[42] February (2017). Seminaires de l'Institut de Mathematiques de Marseille. Marseille, France.

[43] February (2017). Advances in experimental and theoretical studies of astrocyte-neuron interactions, workshop of the 2017 COSYNE conference. Snowbird, Utah, USA.

[44] * January (2017). Ecole de jeunes chercheurs et chercheuses en informatique mathematique. Lyon, France.

[45] January (2017). Workshop "models of life" college de France. Paris, France.

[46] December (2016). CIMPA school "mathematical models in biology and medicine". Moka, Mauritius.

[47] October (2016). Meeting of the GDR biocomp. Lyon.

[48] September (2016). Workshop "in vitro and in silico modelling of neuron-astrocyte communication" of the 2016 bernstein conference. Berlin, Germany.

[49] July (2016). Meeting of the BIOSS working-group. Lyon.

[50] March (2016). Workshop stochastic modelling of transport processes in biology. Manchester, UK.

[51] December (2015). Neuron-glia interactions workshop of the European Institute for Theoretical Neuroscience, EITN. Paris, France.

[52] November (2015). Workshop molecule trajectories in cellular spaces. Lyon, France.

[53] June (2015). Seminars of the centre de recherche en neurobiologie et neurophysiologie de marseille. Marseille, France.

[54] June (2015). Seminars of the LBFA lab. Grenoble, France.

[55] April (2015). Advanced Lecture Course on Computational Systems Biology (CompSysBio). Aussois, France.

[56] March (2015). Seminars of the center for mathematical medecine and biology, The University of Nottingham. Nottingham, UK.

[57] February (2015). Seminars of the PHLAM Lab. Lille, France.

[58] February (2015). NYU Adu Dhabi workshop on computational neuroscience. Abu Dhabi, United Arab Emirates.

[59] January (2015). Quantitative BioImaging 2015. Institut Pasteur, Paris, France.

[60] December (2014). Seminar of the BioMediTech Institute, Tampere University of Technology. Tampere, Finland.

[61] November (2014). Journée de l'IXXI "modéliser des objets biologiques, à l'interface entre biologie et physique". Grenoble, France.

[62] October (2014). First international conference on astrocytes in brain function and dysfunction. Paris, France.

[63] October (2014). MIFOBIO 2014, CNRS multidisciplinary thematic school on functional microscopy in biology. Seignosse, France.

[64] July (2014). OCNS 2014 workshop on computational methods and modeling of astrocyte physiology and neuron-glia interactions. Quebec City, Canada.

[65] July (2014). Thematic days bioimage informatics and cells to tissues modeling. Toulouse, France.

[66] March (2014). Semovi seminar. Grenoble, France.

[67] February (2014). 5th France-israel binational conference on computational neurosciences. Sde-Bokker, Israel.

[68] August (2013). Workshop control of self-organizing nonlinear systems. Wittenberg, Germany.

[69] July (2013). CNS 2013. Paris, France.

[70] July (2013). Bioimage informatics workshop. Paris, France.

[71] June (2013). Dynamique des systemes biologiques. Caen, France.

[72] March (2013). Workshop complex network dynamics. Montpellier, France.

[73] Sept (2012). CEMPI inaugural conference - biology workshop. Lille, France.

[74] June (2012). Ecole de printemps 2012 de la societe francophone de biologie theorique. Saint Flour, France.

[75] May (2012). Workshop on the organization of excitable dynamics in hierarchical neural networks. Bremen, Germany.

[76] October (2011). Workshop on development and learning in artificial neural networks, DevLeaNN, ISC-PIF, Paris, France.

[77] Sept (2011). Seminars of the modeling and image team, MAP5 (Paris 5 laboratory for applied mathematics).

[78] June (2011). 2011 Summer Solstice Conference on Discrete Models of Complex Systems, Turku, Finland.

[79] May (2011). 31st seminar of the Francophone Society for Theoretical Biology (SFBT). Autrans, France.

[80] April (2011). IXXI Lyon seminar on the neurophysiology of cognition. Lyon, France.

[81] May (2010). 2nd workshop school chaos and dynamics in biological networks. Cargese, Corsica, France.

[82] June (2010). 2nd Summer Solstice International Conference on discrete models of complex systems, Nancy, France.

[83] June (2009). 2nd paris workshop on MAS in biology at meso or macroscopic scales, paris, France.

[84] June (2009). 2nd INRIA-NIH workshop on biomedical computing, rocquencourt, France.

[85] March (2009). INRIA-LJAD days on mathematics of living systems, nice, France.

[86] January (2009). Unithe ou cafe, INRIA Saclay, France.

[87] January (2009). Univ. Wisconsin, Madison, Dept. Electrical and Computer Engineering, Madison, Wisconsin,USA.

[88] February (2008). Institut des Systemes Complexes de Paris (ISC-PIF), Paris, France.

[89] February (2008). Journees du GdR Dycoec: Dynamique et controle de ensembles complexes, Nice, France.

[90] January (2008). Programme d'Epigenomique, SMABio group, Evry, France.

[91] December (2007). Institut des Systmes Complexes Rhne-Alpin (IXXI), Lyon, France.

[92] May (2007). Understanding Complex Systems 2007, University of Illinois at Urbana-Champaign, USA.

[93] April (2007). Colloque ANR des projets SDV Jeunes Chercheurs, Nancy, France.

[94] March (2007). Ecole Interdiscipinaire d'Echange et de Formation en Biologie, France.

[95] February 26th (2007). Project-team MAIA, INRIA, Nancy, France.

[96] February (2007). Project-team CORTEX, INRIA, Nancy, France.

[97] November (2006). 3ème workshop applications médicales de l'informatique: Nouvelles approches, AMINA. Monastir, Tunisia.

[98] June (2006). NKS2006 Wolfram Science Conference. Washington D.C., USA.

[99] March (2006). 9emes Rencontres du Non Lineaire. Paris, France.

[100] October (2005). Workshop Phase Transition in Cell Biology, fourth international congress of cellular and molecular biology. Poitiers, France.