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Audrey Denizot

Research Experience

2023.02-now **INRIA junior researcher (CR)**, AIStroSight, INRIA, Lyon, France
2021-2022 **JSPS postdoctoral fellow**, CNU, OIST, Japan. Advisor: Pr. E. De Schutter
2020-2021 **Postdoctoral Scholar**, CNU, OIST, Japan. Advisor: Pr. E. De Schutter
2016-2019 **PhD**, Beagle team, INRIA, LIRIS, France. Advisors: Dr. H. Berry & Pr. H. Soula
Simulating calcium signaling in fine astrocytic processes.

Research internships in experimental & computational neuroscience

2016 Neurocentre Magendie, France. Advisor: Dr. A. Panatier
2015 Beagle team, INRIA, France. Advisors: Dr. H. Berry & Pr. H. Soula
2013 University of Cambridge, England. Advisors: Dr. R. T. Káradóttir & Dr. H. Gautier
2012 Neuroscience research centre, Lyon, France. Advisors: Dr. E. Sotirakis & Pr. J. Honnorat

Education & Diplomas

2016-2019 **PhD in computational neuroscience**, LIRIS, INSA Lyon, France
2016 **Master Biosciences (M.Sc. degree in Biology)**, ENS Lyon, France
2014-2015 **Préparation à l'agrégation** (biology & earth sciences teaching diploma), ENS Lyon, France
2012 License Biosciences (B.Sc. degree in Biology), ENS Lyon, France
2009-2011 Classe préparatoire scientifique, Lycée Carnot, Dijon, France

Awards & Grants

2021-2023 **Grants-in-Aid for JSPS Research Fellow** (JSPS International Research Fellow) grant
2021-2023 **JSPS Postdoctoral Standard Long-term Postdoctoral grant**
2021 Best Poster Award, 1^{st} Virtual Conference of the European Society for Neurochemistry
2020 2020 Trainee Professional Development Award (TPDA), Society for Neuroscience
2019 Travel award for the annual CNS meeting 2019
2018 LIRIS International Mobility Grant
2016-2019 **PhD funding by the French Ministry of Superior Education** (CDSN)
2011-2016 **State Agent-Student position for excellence** at ENS Lyon ("Normalien" grade)

Publications

Code: *: equal contribution

Peer-Reviewed Journals

○ **A. Denizot**, M. Arizono, U. V. Nägerl, H. Berry, & E. De Schutter. Control of Ca2+ signals by astrocyte nanoscale morphology at tripartite synapses, Glia, Sep. 2022, vol. 70, p. 2378-2391.

- A. Covelo, A. Badoual, **A. Denizot**. Reinforcing interdisciplinary collaborations to unravel the astrocyte "Calcium Code", J. Mol. Neurosci., May 2022.

- **A. Denizot**, M. Arizono, U. V. Nägerl, H. Soula, and H. Berry, "Simulation of calcium signaling in fine astrocytic processes: Effect of spatial properties on spontaneous activity," PLOS Computational Biology, vol. 15, p. e1006795, Aug. 2019.

- K. Ceyzériat, L. Ben Haim, **A. Denizot**, D. Pommier, M. Matos, O. Guillemaud, M.-A. Palomares, L. Abjean, F. Petit, P. Gipchtein, M.-C. Gaillard, M. Guillermier, S. Bernier, M. Gaudin, G. Aurégan, C. Joséphine, N. Déchamps, J. Veran, V. Langlais, K. Cambon, A. P. Bemelmans, J. Baijer, G. Bonvento, M. Dhenain, J.-F. Deleuze, S. H. R. Oliet, E. Brouillet, P. Hantraye, M.-A. Carrillo-de Sauvage, R. Olaso, A. Panatier, and C. Escartin, "Modulation of astrocyte reactivity improves functional deficits in mouse models of Alzheimer's disease," Acta Neuropathologica Communications, vol. 6, p. 104, Oct. 2018.

Preprints

- **A. Denizot**, M. F. Veloz Castillo, P. Puchenkov, C. Cali, E. De Schutter. The endoplasmic reticulum in perisynaptic astrocytic processes: shape, distribution and effect on calcium activity, bioRxiv, 2022, doi:10.1101/2022.02.28.482292.

Book chapters

- K. Lenk*, **A. Denizot***, B. Genocchi, I. Seppälä, M. Taheri, S. Nadkarni, Computational models of astrocyte function at glutamatergic synapses, in: "New Technologies for Glutamate Interactions: Neurons and Glia", Springer Nature, NeuroMethods, 2024, *In Press*.

- **A. Denizot**, H. Berry, and S. Venugopal, Intracellular Calcium Signals in Astrocytes, Computational Modeling of, in: Jaeger, D., Jung, R. (Eds.), Encyclopedia of Computational Neuroscience, 2020. Springer, New York, NY, pp. 1–12.

Peer-reviewed International Conference Proceedings

- **A. Denizot**, C. Cali, H. Berry, E. De Schutter. Stochastic Spatially-Extended Simulations Predict the Effect of ER Distribution on Astrocytic Microdomain Ca2+ Activity. Proceedings of the Eight Annual ACM International Conference on Nanoscale Computing and Communication (pp. 1-5), Sept. 2021.

- A. Badoual, M. Arizono, **A. Denizot**, M. Ducros, H. Berry, U. V. Nägerl, C. Kervrann. Simulation of Astrocytic Calcium Dynamics in Lattice Light Sheet Microscopy Images. IEEE 18th International Symposium on Biomedical Imaging (ISBI) (pp. 135-139). IEEE, April 2021

Presentations

Code: †: Poster, ¶: talk, ★: **invited talk**

- **A. Denizot**. "Linking astrocyte morphology to function: insights from computational approaches", GliaLab, Oslo University, Norway, February 2024. ★

- **A. Denizot**. "Dissecting astrocyte function with computational models", Simula, Numerical Analysis and Scientific Computing (SCAN) department meeting, Oslo, Norway, February 2024. ★

- **A. Denizot**, P. Puchenkov, E. De Schutter. Linking astrocyte function to cell shape: insights from computational models, 50th Naito conference, "Glia World - Glial Cells Governing Brain Functions", Sapporo, Japan, October 2023. †

- **A. Denizot**. Linking astrocyte nano-morphology to calcium activity at tripartite synapses, ICVS Satellite Symposium of the ISN-ESN Conference, August 2023, Braga, Portugal. ★

- **A. Denizot**, Tutorial - Modeling astrocytic calcium signaling, Annual Computational Neuroscience Meeting, Leipzig, Germany, July 2023. ★

- **A. Denizot**, P. Puchenkov, E. De Schutter. Computational tools to unravel mechanistic links between intracellular architecture and cell function, XVI European Meeting on Glial Cells in Health and Disease, GLIA 2023, Berlin, Germany. †

- **A. Denizot**. Dissecting the functions of astrocyte nano-architecture using voxel-based computational models, FENS Regional Meeting, May 2023, Algarve, Portugal. ★

- **A. Denizot**. Linking astrocyte morphology to calcium activity: insights from computational approaches, CEA Paris-Saclay, site de Fontenay-aux-Roses, MIRCen, April 2023. ★

- **A. Denizot**, M. F. Veloz Castillo, P. Puchenkov, C. Cali, E. De Schutter. The endoplasmic reticulum in fine astrocytic processes: presence, shape, distribution and effect on Ca2+ activity, Federation of European Neuroscience Societies Forum 2022, Paris, France, July 2022. †

- **A. Denizot**, M. F. Veloz Castillo, C. Cali, E. De Schutter. Endoplasmic reticulum-plasma membrane contact sites in perisynaptic astrocytic processes: properties and effects, Neuro2022, The 45th Annual Meeting of the Japan Neuroscience Society, Okinawa, Japan, June 2022. ¶

- **A. Denizot**. "The Endoplasmic Reticulum in Perisynaptic Astrocytic Processes: Properties and Effects.", "All about astrocytes" symposium, organized by Pr. B. Kuhn, Okinawa Institute of Science and Technology, Japan, July 2022. ★

- **A. Denizot**. "Decoding the astrocytic calcium code with computational approaches", 99th Annual Meeting of the Physiological Society of Japan, Sendai, March 2022. ★

- **A. Denizot**. 8th ACM International Conference on Nanoscale Computing and Communication Virtual Conference, "Spatially-Extended Simulations Predict the Effect of ER Distribution on Astrocytic Microdomain Ca2+ Activity". Sept 2021. https://bit.ly/2YXwMKq ★

- **A. Denizot**, M. Arizono, V. U. Nägerl, E. De Schutter, H. Berry. The nanoscale morphology of astrocyte branchlets governs local calcium activity. The 44th Annual Meeting of the Japan Neuroscience Society, Kobe Convention Center. July 2021. ¶

- **A. Denizot**, C. Cali, H. Berry, E. De Schutter. Probing the localization of the endoplasmic reticulum in the gliapil and its effect on astrocytic calcium signals. XV European Meeting on Glial Cells in Health and Disease, GLIA 2021, July 2021, †

- **A. Denizot**. Disentangling astrocytic calcium signals: insights from spatially-extended models. Annual Computational Neuroscience Meeting, online, July 2021. https://bit.ly/3luuDO1 ★

- **A. Denizot**. Computational approaches for simulating calcium signals in astrocytes: insights, limitations, challenges and perspectives. 1^{st} Virtual Conference of the European Society for Neurochemistry "Future perspectives for European neurochemistry – a young scientist's conference", May 2021, ¶

- **A. Denizot**, C. Cali, H. Berry, E. De Schutter. Elucidating the morphology of the endoplasmic reticulum in fine astrocyte branchlets and its effect on calcium signals. 1^{st} Virtual Conference of the European Society for Neurochemistry "Future perspectives for European neurochemistry – a young scientist's conference", May 2021, †

- **A. Denizot**, C. Cali, H. Berry, E. De Schutter. Elucidating the morphology of the endoplasmic reticulum in fine astrocyte branchlets and its effect on calcium signals. 2021 Virtual Glia Trainee Symposium, March 2021, †

- **A. Denizot**, C. Cali, H. Berry, E. De Schutter. Effect of the geometry of the endoplasmic reticulum on astrocytic Ca2+ signals at tripartite synapses: insights from simulations in realistic 3D geometries, *SfN Global Connectome: A Virtual Event*, January 2021, †

- **A. Denizot**, C. Cali, W. Chen, I. Hepburn, H. Berry, E. De Schutter. Reaction-diffusion simulations of astrocytic Ca^{2+} signaling in realistic geometries, *Annual Computational Neuroscience Meeting*, July 2020, online, https://bit.ly/3i1bqzD https://bit.ly/367A27E †

- **A. Denizot**, M. Arizono, W. Chen, I. Hepburn, H. Soula, V. U. Nägerl, E. De Schutter, H. Berry. Investigating the effect of the nanoscale architecture of astrocytic processes on the propagation of calcium signals, *Annual Computational Neuroscience Meeting*, July 2019, Barcelona, Spain †
- **A. Denizot**, H. Soula, H. Berry, Simulation of calcium signaling in fine astrocytic processes, *OIST Computational Neuroscience Course*, Okinawa, Japan, July 2018 †
- **A. Denizot**, H. Soula, H. Berry, Simulation of calcium signaling in fine astrocytic processes: effect of spatial properties on spontaneous activity, *LyonSysBio*, Lyon, France, Nov. 2017 †¶
- **A. Denizot**, H. Soula, H. Berry, Simulation of calcium signaling in fine astrocytic processes, *OIST Computational Neuroscience Course*, Okinawa, Japan, July 2017 †
- **A. Denizot**, Towards simulation of calcium signaling in fine astrocytic processes, *International Astrocyte School*, Bertinoro, Italy, March 2017 ¶
- **A. Denizot**, H. Soula, H. Berry, Simulation of calcium signaling in fine astrocytic processes, *CompSysbio*, Aussois, France, March 2017 †

Conference Organization

July 2021 Annual CNS Meeting, "Computational approaches for studying astrocyte dynamics & astrocyte-neuron communication". https://astrocytenet.org/cns2021-online-workshop/

Organizers: B. Genocchi, **A. Denizot**, K. Lenk, S. Nadkarni, M. Taheri

Speakers: Y. Goda, A. Borisyuk, J. Shih, A. Scimemi, G. Yu, L. Heja, A. Pillai, R. Jolivet, M. Collard, **A. Denizot**, R. Refaeli, K. Lenk

May 2021 1^{st} Virtual Conference of the ESN, "Let's join forces - Bridging the gap between experimental, computational & data sciences to disentangle astrocyte calcium activity"

Speakers: A. Covelo, A. Badoual & **A. Denizot**

Teaching

2016-2019 **Teaching assistant**: 64h/year to Master students at INSA Lyon & ENS Lyon. Main Subjects: Enzymology (M1), Cellular Biology (M2) & Neurobiology (M2)

2017 Private lessons for students preparing competitive exams to enter French Grandes Ecoles

2008-2011 Private lessons for high-school students in maths, physics and biology

Supervision

PhD students

2023.11-2026 **Andréa Ducos 40%** (with Dr. T. Guyet & Dr. H. Berry)

Project Partial differential equation discovery for spatio-temporal simulations in cells

2023.10-2026 **Schayma Ben Marzougui 50%** (with Dr. H. Berry)

Project Modeling compartmentalized second messenger networks in the retinal growth cones

2023.09-2026 **Florian Dupeuble 70%** (with Dr. H. Berry)

Project Biophysical modeling of neurovascular coupling at the gliovascular unit

Master students

2023.11-2024 **Zoë Laffitte**, UCBL, France. **50%** (with Dr. Jan-Michael Rye)

Implementation of an open-access database of 3D cell meshes for reaction-diffusion simulations

2023.04-07 **Zoë Laffitte**, UCBL, France. **100%**
Designing an open-access database of 3D cell meshes for reaction-diffusion simulations

2023.02-07 **Mathieu Chambard**, UCBL, France. **33%** (with Dr. T. Guyet & Dr. H. Berry)
Multiscale Modeling with Partial Differential Equations (PDEs)

2021.09-12 **Ryo Nakatani**, OIST, Japan. **100%**
Reaction-diffusion modeling of glutamatergic transmission at tripartite synapses

2020.10-12 **Haruki Shigeta**, Tohoku University, Japan. **100%**
Efect of astrocyte-synapse proximity on glutamate concentration in the synaptic cleft

2017.03-07 **Carlos Vivar Rios**, Erasmus+ Master student. **50%** (with Dr. H. Berry)
Effect of spatial constraints in realistic 3D meshes of astrocytic processes on Ca^{2+} signals

Community Service

2024 Reviewer at a scientific evaluation panel from the French National Research Agency (ANR)

2023-now Team representative at the committee of computer resources users (CUMI)

2023 Member of the 1st year PhD evaluation committee of Den-Whilrex Garcia, Paris-Saclay

2023 Member of the 2nd year PhD evaluation committee of Aitakin Ezzati, Université Aix-Marseille

2018-now Reviewer for PLOS Computational Biology, eLife, Communications Biology & Psychoneuroendocrinology

2020-2022 Reviewed applications to the OIST Computational Neuroscience Course 2020 & 2022

2021-2022 Sustainable Development Goals Advisory Group, OIST, Japan

2020-2022 Elected Researcher Representative of the OIST Researcher Community, OIST, Japan

Skills

Biology Neuroscience, Biochemistry, Electrophysiology, Molecular biology, Cellular Biology

Modeling Python, C, ODEs, Monte Carlo

Software/tools Git, LaTeX, STEPS, Blender, Trelis

Professional Development

2023 Training on the supervision of doctoral students ; 2 days

2023 Workplace First-Aid Rescuer (SST: Sauveteur Secouriste du Travail) ; 2 days

2023 Mental Health First Aid Rescuer (PSSM: Premiers secours en santé mentale) ; 2 days

2021 Neuromatch Academy: Deep Learning Course ; 3 weeks

2020 Leadership & Management Skills Course for Postdocs, hfp consulting ; 2 weeks

2017 Okinawa Computational Neuroscience Course ; 3 weeks

Outreach

2019-now **"Papier-Mâché Sciences"** assocation. *https://papiermachesciences.org*
Member of the board of directors & editorial committee. Goal: explain the content of scientific publications in French & outline the scientific method & publication process.

Responsibilities Author, reviewer, translator, editor, co-head of external communication

2021-2023 **"ComSciCon France"**. Proofreader & mentor for "Publithon", where PhD students have to write a scientific article accessible to a large audience. My role was to guide them through the process of scientific writing as well as following editorial guidelines.

2021.07 **"Researcher Appreciation Month"**, OIST, Japan. Co-organization, presentation of a 3min blitz talk, a poster & art pieces derived from my research.

2020.03 **"Researcher Appreciation Week"**, OIST, Japan. '200s research' talk & poster session.

2017-2020 **"DéMesures"** association. *https://demesures.jimdo.com/*

Aim: raising awareness of the importance of scales in science & awakening critical thinking.

Responsibilities Head of collaborations & communication, recruitment manager

Projects
- Founder & co-manager of "Instant Recherche" (researcher interviews)
- Founder & manager of a collaboration with the French radio "Radio Brume" & "Science pour tous" to record podcasts on topics where science and society converge
- Co-manager of the "ArtScience" project
- Led interactive scientific animation: "Fête de la Science" 2017, 2018 & 2019, "GeekTouch" 2017 & 2018, "A Nous de Voir" 2018, "Dans la blouse d'un chercheur" 2018
- Creation of a photo panel on the similarities between science & art
- Co-foundation of the "Cosmograff" project, which presented the Solar System & its scales via a guided walk in Lyon, collaboration with the Musée des Confluences & street artists
- Creation of audio-guides, EWASS annual meeting (astronomy)
- Interview to "Sème ta Science" 2018 to present DéMesures activities

Languages

French	Native	English	Full professional proficiency
German	Intermediate	Spanish	Basic
Japanese	Intermediate	Italian	Basic