Guillaume Lamour

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Summary

- Research Scientist in **biomaterials** and **biophysics** with over 10 years experience in project writing and development. Skilled with AFM (ambient and liquid imaging, force spectroscopy, nanomechanics), cell culture, immunocytochemistry, genetic engineering techniques, manipulation of proteins and lipids, surface modification, molecular dynamics simulations, and scripting in Matlab.
- Co-author of 21 peer-reviewed publications in international scientific journals (including *ACS Nano*, *JACS*, *Phys Rev X*, *Biomaterials*, *Biophys J*, *etc.*)

Research Interests

Interfacing physics, chemistry and computing with biology at the nanoscale; biomaterials; biophysics; bioengineering; nanomechanics; polymer physics; self-assembly; amyloids; lipid membranes; atomic force microscopy; development of technical and software tools for quantitative measurements in biology.

Professional Experience

Research Associate/Engineer 2017–present
Lambe, UMR8587, team "Polymers at Interfaces", University of Evry, France.

→ Developing an AFM platform to discover how actin filament networks can mechanically remodel lipid membranes. This helps understanding mechanisms underlying endocytosis, vesicle formation, and may open up new research avenues in drug design targeting membrane-cytoskeleton interactions.

Postdoctoral Research Fellow 2011–2016
Gsponer and Li labs, Biochemistry Department, UBC, Vancouver, Canada

→ Investigated amyloids and connected their mechanical properties (stiffness, strength) with the intermolecular interactions in the fibrils. This helps understanding the molecular origins of amyloid diseases (e.g. Alzheimer's or prion diseases) and may help in designing amyloid-based nanomaterials with tailored mechanical properties.

Ph.D. Researcher 2006–2010
Hamraoui lab, Biomedical Department, University of Paris Descartes, France.

→ Discovered how nanoscale spatial variations in adhesion energy of self-assembled monolayers, used as culture substrates, can dramatically affect the adhesion and differentiation of neuronal cells (i.e. making axons and dendrites). This may help designing new biocompatible materials with controlled physico-chemical surface features.

Education

Universities of Paris Descartes and Paris Diderot, France

Ph.D. in Interfaces of Chemistry, Physics, and Informatics with Biology (2010)

M.Sc., Cellular and Molecular Biophysics (2006)

B.Sc., Physical-Chemistry (2004)

Service Activities

Reviewed research articles for following journals: *ACS Nano*, *Biophys J*, *J Biomed Mater Res A*, *Langmuir*, *J Mol Model*.

Funding

Doctoral work: French Ministry of Research (2006–2009). Postdoc: Genopole fellowship (2017–2019, 150 k€), ANR Dynactube. AFM equipment: DIM Respore.

Teaching TUTORIAL LECTURER

– 2016: *Physics* classes to Physics students and *Biophysics* classes to Biology students at the University of Evry (96 h; 3 × 40 students; 1st year undergraduates): Mechanics, electricity and optics.

– 2007: *Physics* classes to medical school students at the Faculty of Medicine, University of Paris Descartes (66 h; 2 × 40 students; 1st year undergraduates): Diffusion (fluid statics and dynamics), electricity and optics.

MENTOR/(CO-)ADVISOR
Universities of Evry, Paris Descartes and University of BC. Students (level):

– Rogerio Lopes (Ph.D.): Interaction of actin networks and lipid nanotubes. 2019–present
– Maxime Liboz (Ph.D.): Cell mechanics using AFM force mapping. 2018–present
– Roy Nassar (Ph.D.): Nanomechanics of amyloid fibrils *in silico*. 2015–2018
– Laleh Samii (Ph.D.): AFM imaging of modified DNA strands. 2013–2014
– Yongnan Li (M.Sc.): Steered molecular dynamics simulations on the GB1 protein. 2011
– Xin Du (Ph.D.): Effects of Cathepsin K on collagen fibrils. 2011
– Alexandre Teixeira (M.Sc.): Software tool for contact angle analysis. 2009

Journal Publications
h-index = 13

- Webpages (including citation profile):
  – Google Scholar: scholar.google.ca/citations?user=8AxLjooAAAAJ&hl=en&oi=ao
  – ResearcherID: www.researcherid.com/rid/D-6758-2015

  → Since 2009: 9 first-, 6 second-, and 2 last-author publications.
  → Since 2015: > 550 citations.

- Selected Publications (corresponding author underlined):

[1] **Lamour G.**, A. Allard, J. Pelta, S. Labdi, M. Lenz, and C. Campillo. . *Mapping and modeling the nanomechanics of bare and protein-coated lipid nanotubes.* PHYS REV X. 2020; 10:011031-1–17. Journal impact factor (IF) = 12

[2] Nassar R., E. Wong, J. Gsponer, and **G. Lamour**. *Inverse correlation between amyloid stiffness and size.* J AM CHEM SOC. 2019; 141:58–61. IF = 15

[3] Nassar R., E. Wong, JM. Bui, CK. Yip, HB. Li, J. Gsponer, and **G. Lamour**. *Mechanical anisotropy in GNNQQNY amyloid crystals.* J PHYS CHEM LETT. 2018; 9:4901–09. IF = 7

[4] **Lamour G.**, C. Yip, HB. Li, and J. Gsponer. *High intrinsic mechanical flexibility of mouse prion nanofibrils revealed by measurements of axial and radial Young's moduli.* ACS NANO. 2014; 8:3851–61. IF = 14

[5] **Lamour G.**, A. Eftekhari-Bafrooei, E. Borguet, S. Souès, and A. Hamraoui. *Neuronal adhesion and differentiation driven by nanoscale surface free-energy gradients.* BIOMATERIALS. 2010; 31:3762–71. IF = 10

Conference Talks

– GORDON-KENAN RESEARCH SEMINAR, Lewiston, **USA**. 2011
– FRONTIERS IN BIOPHYSICS, Vancouver, **Canada**. 2013
– MOLECULAR ORIGINS OF NEURODEGEN. DISEASES, Vancouver, **Canada**. 2014
– BPS MEETING: POLYMERS AND SELF-ASSEMBLY, Rio de Janeiro, **Brazil**. 2015
– GDR 3070, PHYSICS FROM THE CELL TO THE TISSUE, Arcachon, **France**. 2016
– FRENCH MICROSCOPY SOCIETY (SFμ), Poitiers, **France**. 2019
– MICROSCOPIES À SONDES LOCALES, Saint-Valéry-sur-Somme, **France**. 2020
– 8TH MULTIFREQUENCY AFM CONFERENCE, Madrid, **Spain**. 2020

Invited Seminars	– Universidad de Los Andes, Dept. of Physics, Bogota, **Colombia**.	2010
	– Institute for Bioengineering of Catalonia, Barcelona, **Spain**.	2010
	– McGill University, Dept. of Bioengineering, Montreal (QC), **Canada**.	2014
	– DuPont Central R&D, Materials Science, Wilmington (DE), **USA**.	2015
	– Simon Fraser University, Biophysics Group, Burnaby (BC), **Canada**.	2015
	– Illumina Inc., San Diego (CA), **USA**.	2015
	– Cambridge University, Dept. of Physiology, Dev. and Neurosci., **UK**.	2015
	– Collège de France, LCMCP, Paris, **France**.	2016
	– Sorbonne Université, IBPS, Paris, **France**.	2020
Poster Presentations	– European Biophysics Congress, London, **UK**.	2007
	– Forum of European Neurosciences Soc., Geneva, **Switzerland**.	2008
	– Physics of Cells (EMBO), Primošten, **Croatia**.	2009
	– Prion New World, Montreal (QC), **Canada**.	2011
	– Gordon Res. Conf.: Science of Adhesion, Lewiston (ME), **USA**.	2011
	– Prion, Amsterdam, **Netherlands**.	2012
	– Biophysical Society meeting, Philadelphia (PA), **USA**.	2013
	– SPM on Soft Polymeric Materials, Toronto (ON), **Canada**.	2014
	– Physics and Biological Systems, Palaiseau, **France**.	2016
	– Physics and Biological Systems, Gif-sur-Yvette, **France**.	2018