Curriculum vitae (November 11th, 2019)

Daniel JOST

born: February 15th, 1982
citizenship: French
Married, three children

Laboratoire LBMC (Biology & Modeling of the Cell)
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Education:

2007-2010	Ph.D in theoretical physics - École Normale Supérieure de Lyon (Lyon, France).
2004-2007	M.Sc in Physics (Statistical, non-linear and numerical physics) - École Normale Supérieure de Lyon (Lyon, France).
2005-2006	Agrégation externe de Sciences Physiques.
2003-2004	B.Sc in Physics - École Normale Supérieure de Lyon (Lyon, France).

Research activities:

2019-present	LBMC, CNRS UMR 5239, ENS de Lyon, Lyon, France. Group Leader of 'Physical Biology of Chromatin'. CNRS Research Associate (CRCN).
2014-2018	TIMC-IMAG, CNRS UMR 5525, University Grenoble-Alpes, La Tronche, France. Team BCM. CNRS Research Associate (CRCN).
2012-2014	Laboratoire de Physique de l'École Normale Supérieure de Lyon (Lyon, France). Fixed-term lecturer and research fellow.
2010-2012	Department of Physics, Harvard University (Cambridge, USA). Post-doc in the group of Erel Levine.
2007-2010	Laboratoire de Physique et Centre Blaise Pascal de l'École Normale Supérieure de Lyon (Lyon, France). PhD student in the group of Ralf Everaers.
2007	Laboratoire de Physique et Centre Blaise Pascal de l'École Normale Supérieure de Lyon (Lyon, France). 4 months internship in the group of Ralf Everaers.
2005	Institute for Microstructural Sciences (Ottawa, Canada). 3 months internship in the group of Chandre Dharma-Wardana.
2004	Institut Fresnel (Marseille, France). 2 months internship in the group of Pierre-François Lenne.

Teaching activities:

2015-present	Participation in several systems biology courses (M2 Physique, ENS Lyon; M2 Interface Physique-Biologie, ENS Lyon; M1 Biologie-Santé, Univ. Montpellier; M2 Biologie, Univ. Grenoble-Alpes)
2015	Mentoring project for ENSIMAG students (projet spé 2A).
2012-2014	Fixed-term lecturer in the Department of Physics at ENS Lyon (Agrégé préparateur): 280 hours of teaching (dynamical systems, numerical methods, mathematics, thermodynamics,...).
2007-2010	Teaching assistant in the Department of Physics at ENS Lyon (Monitorat): 192 hours of teaching (numerical methods, thermodynamics, electromagnetism,...).

Responsabilities:

- Team leader at LBMC (2019-present).
- Regular referee for *Nature Communications*, *Biophysical Journal*, *Nucleic Acids Research*, *Phys. Biol.*, *PLoS Comp. Biol.*, *BMC Bioinfo.*, *AIMS Biophys.*, *J. Phys: Cond. Matt.*, *J. Chem. Phys.*, *Phys. Rev. Lett.*, *Phys. Rev. E* and *Phys. Rev. X*.
- Review Editor for *Frontiers in Biophysics* (2017-present).
- Member of the scientific board of SeMoVi (2014-present).
- External referee for ANR (French funding agency) (2015) and MRC (UK funding agency) (2018).
- Member of the intra-lab news journal (2016-2018).
- Elected member of the laboratory council (2016-2018).
- Member of the direction committee of the Institut Rhône-Alpin des Systèmes Complexes IXXI (2017-present).
- Member of the organization and scientific committee of the CompSysBio school (2018-present).
- Member of the organization and scientific committee of the 3DGenomics school (2019-present).
- In charge of the communication and of one WP in the IDEX project SYMER (2018-2022).
- Participation to thesis committees and juries (Zara Fahmi, 2018 [Babraham Institute, Cambridge, UK]; Sylvain Pulicani, 2018 [LIRMM, Montpellier, France]; Andrea Papale [SISSA, Trieste, Italy])
- Member of GDR Architecture Du Noyau, GDRI EpiGene2Sys and COST Action EUTOPIA.
- Member of the Management Committee and Working group leader of the COST Action International Nucleome Consortium (2019-present)
- Organizer of the LBMC/Physics lab joint meeting at ENS Lyon (2019-present).

People:

2019-2022	Amith Zafal Abdulla. Ph.D (with C. Vaillant)
2019-2021	Maxime Tortora. Postdoctoral fellow.
2019-2021	Hossein Salari. Postdoctoral fellow.
2019	Bahareh Afshinpour. Bioinformatic engineer (6 months) (with M. Richard).
2019	Amir Jahangiri. 4 months internship (M1).
2019	Antoine Dessus. 1 month internship (L3).
2018-2021	Kapil Newar. Ph.D (with Eric Fanchon).
2018-2021	Clémentine Descamps. 6 months internship (M2)+ Ph.D (with M. Richard).
2018	Antoine Roland. 5 months internship (M2).
2017	Paul Terzian. 6 months internship (M2, with M. Richard).
2016-2018	Magali Richard. Post-doctoral fellow.
2016-2018	Surya Ghosh. Post-doctoral fellow.
2016	Jérémy Vachier. 4 months internship (M2, with Cédric Vaillant)
2016	Axel Verdier. 6 months internship (M2, with Cédric Vaillant)
2016	Jose Carlos Marugan. 6 months internship (M2).
2015	Solène Lyon. 3 months internship (M1).
2015	Juan Olarte-Plata. 4 months internship (M2, with Cédric Vaillant).
2014	Mehari Zerihun. 4 months internship (M2).
2013-2016	Noelle Haddad. Ph.D (with Cédric Vaillant).
2010	Asif Zubair. 5 months internship (M2, with Ralf Everaers).

Funding:

2014-2016 IXXI Rhône-Alpes and AGIR Université de Grenoble: GeneDivNet - Genetic diversity of network properties in dynamic environments (principal investigator, in collaboration with G. Yvert).

2015-2018 ANR (Agence Nationale de la Recherche): EpiDevoMath - Epigenetic regulation of development: towards a predictive mathematical modeling of three dimensional genome folding and cellular memory (partner, in collaboration with G. Cavalli [PI of the project], R. Everaers and C. Vaillant).

2016-2018 FRM (Fondation pour la Recherche Médicale): The physico-chemistry of nuclear reorganization during cellular senescence (partner, in collaboration with G. Cavalli [PI of the project] and C. Vaillant).

2016-2019 ITMO Cancer/INSERM (Plan Cancer): Discovery and Modeling of epigenetically regulated genomic domains in lung cancer (principal investigator, in collaboration with S. Khochbin, E. Brambilla and C. Vaillant).

2018 CNRS Mission Interdisciplinarité: Quantitative modeling of chromosome 3D reorganization during senescence: role of nucleosome and HMGA proteins (principal investigator, in collaboration with C. Vaillant and G. Cavalli).

2018-2022 IDEX Univ Grenoble-Alpes: SYMER - A systems approach to new paradigms in metabolic and epigenetic regulation (partner, in collaboration with U. Schlattner [PI of the project] and more than 40 scientists from Univ Grenoble-Alpes).

2018-2021 ANR (Agence Nationale de la Recherche): SinFoNIE - Single gene Focus during Nuclear receptor Induced Expression (partner, in collaboration with K. Bystricky [PI of the project] and T. Sexton).

2019-2022 ANR Young Investigator program (Agence Nationale de la Recherche): 3DynOrg - Quantitative modeling of the 3D dynamical organization of chromosomes (PI).

Publications:

Research articles:

1. C. Decamps, F. Privé, R. Bacher, D. Jost, A. Waguet, HADACA consortium, E.A. Houseman, E. Lurie, P. Lutsik, A. Milosavljevic, M. Scherer, M.G.B. Blum & M. Richard. Guidelines for cell-type heterogeneity quantification based on a comparative analysis of reference-free DNA methylation deconvolution software, in submission, bioRxiv 698050 (2019).

2. S. Sati, B. Bonev, Q. Szabo, D. Jost et al, DNMT1 drives 4D genome rewiring during oncogene induced senescence, in submission (2019).

3. M. Richard, C. Decamps, F. Chuffart, E. Brambilla, S. Rousseaux, S. Khochbin & D. Jost, *PenDA, a rank-based method for Personalized Differential Analysis: application to lung cancer*, in submission (2019).

4. K. Pal, M. Forcato, D. Jost, T. Sexton, C. Vaillant, E. Salviato, E.M.C. Mazza, E. Lugli, G. Cavalli & F. Ferrari, *Global chromatin conformation differences in the Drosophila dosage compensated chromosome X*, Nature Com. **10**: 5355 (2019).

5. M. Socol*, R. Wang*, D. Jost*, P. Carrivain*, C. Vaillant, E. Le Cam, V. Dahirel, C. Normand, K. Bystricky, J.M. Victor, O. Gadal & A. Bancaud, Rouse model with transient intramolecular contacts on a timescale of seconds recapitulates folding and fluctuation of yeast chromosomes, Nucleic Acids Res, gkz374 (2019). (* joint first authors)

6. S. K. Ghosh & D. Jost, *How epigenome drives chromosome folding and dynamics, insights from efficient coarse-grained models of chromosomes*, PLoS Comp. Biol. **14**, e1006159 (2018).

7. Q. Szabo, D. Jost, J.-M. Chang, D. Cattoni, G. L. Papadopoulos, B. Bonev, T. Sexton, J. Gurgo, C. Jacquier, M. Nollmann, F. Bantignies & G. Cavalli, *TADs are 3D structural units of higher-order chromosome organization in Drosophila*, Science Adv., **4**, eaar8082 (2018).

8. D. Jost & C. Vaillant, *Epigenomics in 3D: importance of long-range spreading and specific interaction in epigenomic maintenance*, Nucleic Acids Res., **46**, 2252-2264 (2018).

9. M. Richard*, F. Chuffart, G. Duplus-Bottin, F. Pouyet, E. Fulcrand, M. Entrevan, A. Barthelaix, M. Spichty, D. Jost* & G. Yvert*, *Assigning function to natural allelic variation via dynamic modeling of the inducibility of a gene network*, Mol. Syst. Biol., **14**, e7803 (2018). (* joint corresponding authors)

10. N. Haddad, D. Jost* & C. Vaillant*, *Perspectives: Using polymer modeling to understand the formation and function of nuclear compartments*, Chrom. Res. **25**: 35-50 (2017). (* joint corresponding authors)

11. N. Haddad, C. Vaillant & D. Jost, *IC-Finder: inferring robustly the hierarchical organization of chromatin folding*, Nucleic Acids Res. **45**: e81 (2017).

12. F. Chuffart, M. Richard, D. Jost, C. Burny, H. Duplus-Bottin, Y. Ohya & G. Yvert, *Exploiting single-cell quantitative data to map genetic variants having probabilistic effects*, PLoS Genetics, **12**: e1006213 (2016).

13. J.D. Olarte-Plata, N. Haddad, C. Vaillant & D. Jost, *The folding landscape of the epigenome*, Phys. Biol., **13**: 026001 (2016).

14. M.B. Zerihun, C. Vaillant & D. Jost, *Effect of replication on epigenetic memory and consequences on gene transcription*, Phys. Biol., **12**: 026007 (2015).

15. R. Sharma, D. Jost, J. Kind, G. Gomez-Saldivar, B. van Steensel, P. Askjaer, C. Vaillant & P. Meister, *Differential spatial and structural organization of the X chromosome underlies dosage compensation in C. elegans*, Genes Dev. **28**: 2591-2596 (2014).

16. A. Lavi-Itzkovitz*, N. Peterman*, D. Jost* & E. Levine, *Quantitative effect of target translation on small RNA efficacy reveals a novel mode of interaction*, Nucleic Acids Res.**42**: 12200-12211 (2014). (* joint first authors)

17. D. Jost, P. Carrivain, G. Cavalli & C. Vaillant, *Modeling epigenome folding: formation and dynamics of topologically-associated chromatin domains*, Nucleic Acids Res. **42**: 9541-9549 (2014).

18. D. Jost, *Bifurcation in epigenetics: implication to development, proliferation and diseases*, Phys. Rev. E **89**: 010701 (2014).

19. S. Meyer, D. Jost, N. Theodorakopoulos, M. Peyrard, R. Lavery & R. Everaers, *Temperature dependence of the DNA double-helix at the nanoscale: structure, elasticity and fluctuations*, Biophys. J. **105**: 1904-1914 (2013).

20. D. Jost, *Twist-DNA: computing base-pair and bubble opening probabilitites in genomic superhelical DNA*, Bioinformatics **29**: 2479-2481 (2013).

21. D. Jost, A. Nowojewski & E. Levine, *Regulating the many to benefit the few: role of weak small RNA targets*, Biophys. J. **104**: 1773-1782 (2013).

22. D. Jost, A. Zubair & R. Everaers, *Bubble statistics and positioning in superhelically stressed DNA*, Phys. Rev. E **84**: 031912 (2011).

23. D. Jost & R. Everaers, *Prediction of RNA multi-loop and pseudoknot conformations from a lattice-based, coarse-grain tertiary structure model*, J. Chem. Phys. **132**: 095101 (2010).

24. D. Jost & R. Everaers. *A unified Poland-Scheraga model of oligo- and polynucleotide DNA melting: salt effects and predictive power*, Biophys. J. **96**: 1056-1067 (2009).

25. D. Jost & R. Everaers. *Genome wide application of DNA melting analysis*, J. Phys: Condens. Matter **21**: 034108 (2009).

26. D. Jost & M.C.W. Dharma-Wardana. *Ground-state energy and Wigner crystallization in thick two-dimensional electron systems*, Phys. Rev. B **72**: 195315 (2005).

Review articles/Book chapters:

1. S.K. Ghosh & D. Jost, *Genome organization via loop extrusion, insights from polymer physics models*, Brief. Func. Genom., elz023 (2019).

2. C. Vaillant & D. Jost, *Modeling the functional coupling between 3D chromatin organization and epigenome*, in "Modeling the 3D conformation of genomes" in the Computational Biophysics Series (Taylor & Francis, Editors G. Tiana & L. Giorgetti) (2019).

3. D. Jost, A. Rosa, C. Vaillant & R. Everaers, *A polymer physics view on universal and sequence-specific aspects of chromosome folding*, in "Nuclear Architecture and Dynamics" in the Translational Epigenetics Series (Elsevier, Editors C. Lavelle & J.-M. Victor) (2018).

4. D. Jost, C. Vaillant & P. Meister, *Coupling 1D modifications and 3D nuclear organization: data, models and function*, Curr. Opin. Cell Biol., **44**: 20-27 (2017).

5. D. Jost, A. Nowojewski & E. Levine, *Small RNA biology is systems biology*, BMB Rep. **44**: 11-21 (2011).

Communications at conferences, seminars or schools:

1. Chromatin Club (Lyon, December 2019), *invited speaker.*

2. 4D Genome Computational Day (Lyon, November 2019), *invited speaker.*

3. CECAM Workshop: Modeling phase separation in health and disease: from nano- to meso-scale (Toulouse, October 2019), *invited speaker.*

4. Epigene2sys Meeting (London, September 2019), *poster presentation.*

5. LifeTime Unconference (Barcelona, July 2019), *invited speaker.*

6. Gordon Research Conference: Chromosome Dynamics (Newry, June 2019), *poster presentation.*

7. Science Week IDEX University Grenoble-Alpes (Grenoble, June 2019), *invited speaker.*

8. CompSysBio2019, Advanced Lecture Course on Computational Systems Biology (Aussois, April 2019), *poster presentation.*

9. CBI Mini-Symposium on Cell-to-cell variability & Chromosomes (Toulouse, February 2019), *invited speaker.*

10. ICSB2018, International Conference on Systems Biology (Lyon, October 2018), *oral presentation.*

11. Chromatin and nuclear organization (Pisa, October 2018), *invited speaker.*

12. INRIAbcd seminar (Lyon, July 2018), *invited speaker.*

13. Lipkow's group seminar at Babraham Institute (Cambridge, June 2018), *invited speaker.*

14. Journée Technologies de la Santé Grenobloises (Grenoble, June 2018),*invited speaker.*

15. BIOP team seminar at LIPhy (Grenoble, June 2018), *invited speaker.*

16. CECAM Workshop: Epigenetics and Multiscale Genomics (Lausanne, May 2018), *invited speaker.*

17. Lecture series on Epigenetics, Chromatin and Nuclear Organization at the Institute of Cell Biology (Bern, March 2018), *invited speaker.*

18. 14th course on Epigenetics of Institut Curie (Paris, March 2018), *invited speaker.*

19. LBMC seminar (Lyon, March 2018), *invited speaker.*

20. Epigene2Sys Meeting (Munich, January 2018), *poster presentation.*

21. BEeSy retreat (Grenoble, December 2017), *invited speaker.*

22. gopro2017: Optimized management of space: from cities to natural systems (Lyon, December 2017), *invited speaker.*

23. Lyon SysBio 2017 (Lyon, November 2017), *poster presentation.*

24. BioMed Conference: Multidimensional Genomics: the 3D/4D organization of chromatin (Barcelona, November 2017), *invited speaker.*

25. CBS Seminar (Montpellier, June 2017), *invited speaker.*

26. Rencontres scientifiques des Grands Causses: Modélisation physique de l'organisation nucléaire et de ses pathologies (Millau, May 2017), *invited speaker.*

27. CECAM Workshop: Multiscale Modeling and Experimental Approaches to Genome Organization (Les Houches, April 2017), *invited speaker.*

28. Physics-Biology interface seminar (Paris, March 2017), *invited speaker.*

29. 1st qBio mini-Workshop (Milan, February 2017), *invited speaker.*

30. Lyon SysBio 2016 (Lyon, November 2016), *oral presentation.*

31. CECAM Workshop: Mesoscopic Modeling in Physics of Molecular and Cell Biology (Toulouse, October 2016), *oral presentation.*

32. INFN BioPhys consortium (Bari, September 2016), *invited speaker.*

33. CSHL Meeting: Epigenetics & Chromatin (Cold Spring Harbor, September 2016),*poster presentation.*

34. StatPhys26 (Lyon, July 2016), *oral presentation.*

35. ICTP workshop: Genome Architecture in Space and Time (Trieste, June 2016), *invited speaker.*

36. Meeting of the GDR Architecture et Dynamique Nucléaire (ADN) (Paris, April 2016), *oral presentation.*

37. Epigenesys Meeting 2016 (Paris, February 2016), *poster presentation.*

38. Lyon SysBio 2015 (Lyon, November 2015), *poster presentation.*

39. EMBO Conference: Nuclear structure and dynamics (Isle-sur-la-Sorgues, October 2015), *poster presentation.*

40. Symposium "Signaling through chromatin" (Grenoble, September 2015), *oral presentation.*

41. JOBIM 2015: Journée Ouverte en Biologie, Informatique & Mathématiques (Clermond-Ferrand, July 2015), *oral presentation.*

42. CECAM Workshop: Integrative genomics with hierarchical physical models of DNA and chromosomes (Lyon, June 2015), *invited speaker.*

43. EMBO Conference: Chromatin and Epigenetics (Heidelberg, May 2015), *poster presentation.*

44. BEeSy 2015: Perspectives in Environmental and Systems Biology (Grenoble, April 2015), *oral presentation.*

45. Meeting of the GDR Architecture et Dynamique Nucléaire (ADN) (Paris, April 2015), *oral presentation.*

46. Lyon SysBio 2014 (Lyon, November 2014), *oral presentation.*

47. SeMoVi seminar: epigenetics (Lyon, September 2014), *invited speaker.*

48. ICTP workshop: Interdisciplinary views on chromosome structures and functions (Trieste, September 2014), *poster presentation.*

49. Adhesion & Inflammation lab seminar (Marseille, June 2014), *invited speaker.*

50. Meeting of the GDR CellTiss (Lyon, November 2013), *poster presentation.*

51. EMBO Conference: Nuclear structure and dynamics (Isle-sur-la-Sorgues, October 2013), *poster presentation.*

52. Meeting of the GDR Architecture et Dynamique Nucléaire (ADN) (Paris, April 2013), *oral presentation.*

53. Meeting of the GDR CellTiss (Autran, October 2012), *oral presentation.*

54. APS March Meeting (Boston, March 2012), *oral presentation.*

55. Keystone Symposium: Gene Silencing by Small RNAs (Vancouver, February 2012), *poster presentation.*

56. Systems Biology Retreat (Portsmouth, October 2011), *poster presentation.*

57. Cells, Circuits, and Computation 2011 (Cambridge, January 2011), *poster presentation.*

58. CECAM workshop: Coarse-grain mechanics of DNA: bases to chromosomes (Lyon, June 2010), *invited speaker.*

59. APS March Meeting (Portland, March 2010), *oral presentation.*

60. BioStruc09: Unraveling the structure of biomolecules: from non-equilibrium statistical mechanics to mechanical manipulation (Florence, February 2009), *poster presentation.*

61. Modelling complex biological systems in the context of genomics (Lille, April 2008), *poster presentation.*