

Arvind 'Rasi' Subramaniam

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Education

- Ph.D. in Physics, University of Chicago 2008
- B.Tech. in Metallurgical and Materials Engineering, Indian Institute of Technology Madras, India 2004

Employment

- Assistant Professor 2015–
Basic Sciences Division & Computational Biology Section of Public Health Sciences Division
Fred Hutchinson Cancer Research Center, Seattle, WA
- Postdoctoral Fellow 2008–2015
Center for Systems Biology & Department of Molecular and Cellular Biology
Harvard University, Cambridge, MA. Advisors: Erin O'Shea, Phillippe Cluzel
- Graduate Fellow 2005–2008
Theoretical Condensed Matter Physics Group
University of Chicago, Chicago, IL. Advisor: Ilya Gruzberg

Honors

- CAREER Award, National Science Foundation 2018
- Sidney Kimmel Scholar 2017
- K99/R00 Pathway to Independence Award, National Institutes of Health 2013
- Wentzel Research Prize for Outstanding Research in Theoretical Physics 2007
University of Chicago
- Chandrasekhar, McCormick, and Sachs Graduate Research Fellowships 2004
University of Chicago
- Dhandapani Memorial Prize for highest GPA in Metallurgical and Materials Engineering 2004
Indian Institute of Technology Madras, India

Other Affiliations

- Affiliate Assistant Professor 2017–
Department of Genome Sciences & Department of Microbiology & Department of Biochemistry
University of Washington, Seattle
- Participant in the Program on 'Random Shapes' 2007
Institute for Pure and Applied Mathematics
University of California, Los Angeles
- Visiting Affiliate in the Program on 'Stochastic Geometry and Field Theory' 2006
Kavli Institute for Theoretical Physics
University of California, Santa Barbara

Graduate Research Fellow Experimental Condensed Matter Physics University of Chicago, Advisor: Thomas Rosenbaum	2004–2005
Summer Undergraduate Research Fellow Material Science & Engineering California Institute of Technology, Advisor: Sossina Haile	2003
Summer Research Fellow Department of Physics Indian Institute of Science, Bangalore, Advisor: Arup Kumar Raychaudhuri	2002

Invited Talks

Translational Machinery in Health and Disease Gordon Research conference, Galveston	2021
Biophysics Group, Massachusetts Institute of Technology, Cambridge	2020
Department of Genetics, Rutgers University, New Brunswick	2020
Emergent Simplicity in Biophysical Dynamics TSRC workshop, Telluride	2019
Department of Medical Genetics, University of Washington, Seattle	2018
Department of Biochemistry, University of Washington, Seattle	2017
Combi Seminar, Department of Genome Sciences, University of Washington, Seattle	2016
Department of Molecular Biology and Genetics, Johns Hopkins University School of Medicine, Baltimore	2014

Teaching

Instructor, MCB 517: Tools for Computational Biology, University of Washington, Seattle	2018–19
Teaching Assistant, Foundations of Systems Biology and Bioengineering, Harvard University	2012
Teaching Assistant, Introduction to Quantitative Tools for Cell Biology, Harvard University	2010
Teaching Assistant, Symplectic Methods of Classical Dynamics, University of Chicago	2008
Teaching Assistant, Advanced Mathematical Methods of Physics, University of Chicago	2008
Teaching Assistant, Solid State Physics, University of Chicago	2007

Ph.D. Trainees

Katharine Chen, Molecular and Cellular Biology, University of Washington	2019–
Ty Bottorff, Biophysics, Structure and Design Graduate Program, University of Washington	2019–
Patrick Nugent, Molecular and Cellular Biology, University of Washington	2018–
Philip Burke, Microbiology, University of Washington (joint with Jesse Bloom)	2017–
Heather Machkovech, Genome Sciences, University of Washington (joint with Jesse Bloom)	2016–18

Postdoctoral Trainees

Heungwon Park	2016–
Michelle Kriner	2016–18

Research Technician Trainees

Yuya Zhao	2018–
Shea Ransford	2017–18
Michael 'Max' Ferrin	2015–17

Ph.D. Thesis Committee

Kristian Davidsen, Molecular and Cellular Biology, University of Washington	2020–
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Alison Greenlaw, Molecular and Cellular Biology, University of Washington	2020–
Alexandre Germanos, Molecular and Cellular Biology, University of Washington	2019–
Samantha Schuster, Molecular and Cellular Biology, University of Washington	2019–
Bianca Ruiz, Genome Sciences, University of Washington	2018–
Dylan Udy, Molecular and Cellular Biology, University of Washington	2017–
Joey Pangallo, Molecular and Cellular Biology, University of Washington	2016–
Ethan Keeler, Electrical Engineering, University of Washington	2016–2018
Robin Green, Molecular and Cellular Biology, University of Washington	2015–2017
Qing Feng, Molecular and Cellular Biology, University of Washington	2015–2017

Other Service

Organizer, Computational Biology Seminar Series, Fred Hutchinson Cancer Research Center	2017–
Weintraub Graduate Student Award Selection Committee, Fred Hutchinson Cancer Research Center	2017
Admissions Committee, Biophysics and Structural Design Graduate Program, University of Washington	2017–18
Admissions Committee, Molecular and Cellular Biology Graduate Program, University of Washington	2016–17
Lead Organizer (joint with Jeffrey Moffitt), Microbial Sciences Initiative Journal Club, Harvard University	2010
Organizer, Metallurgical and Materials Engineering Student Association, IIT Madras, India	2002–03

Reviewer and Referee

Ad-hoc journal referee for PNAS, PLoS Biology, eLife, Cell Reports, Nature Communications, Nature Microbiology, Physical Biology, Physical Review Letters, Physical Review B

Ad-hoc grant reviewer for US National Science Foundation, US-Israel Binational Foundation, Research Foundation – Flanders Belgium, Swedish Foundation for Strategic Research, Israel Ministry of Science and Technology, Swiss National Science Foundation

Reviewer for Regeneron Science Talent Search Competition (2018)

Extramural Research Support

Current

NSF CAREER MCB-1846521 (PI) Experimentally Integrated Modeling of Quality Control During Eukaryotic mRNA Translation 100,000\$ direct costs per year	2019–24
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NIH R35 GM119835 (PI) Regulation of Protein Synthesis by Synonymous Codon Usage 235,000\$ direct costs per year	2016–21
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Completed

Sidney Kimmel Scholarship (PI) Quantitative Profiling of Synonymous Mutation Effects in Cancer Cells 100,000\$ total costs per year	2017–19
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NIH K99/R00 GM107113 (PI) Role of Synonymous Codon Usage as Gene Regulators in Bacteria and Cancer Cells 680,000\$ total costs over 4 years	2013–17
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Publications

(corresponding authors are underlined)

16. Kriner MA, Subramaniam AR. The serine transporter SdaC prevents cell lysis upon glucose depletion in *Escherichia coli*. *MicrobiologyOpen* 9(2):e960 (2020). [DOI](#)
15. Park H, Subramaniam AR. Inverted translational control of eukaryotic gene expression by ribosome collisions. *PLoS Biology* 17(9):e3000396 (2019). [DOI](#)
14. Machkovech HM, Bloom JD, Subramaniam AR. Comprehensive profiling of translation initiation in influenza virus infected cells. *PLoS Pathogens* 15(1):e1007518 (2019). [DOI](#)
13. Darnell AM, Subramaniam AR, O'Shea EK. Translational control through differential ribosome pausing during amino acid limitation in mammalian cells. *Molecular Cell* 71 229 (2018). [DOI](#)
12. Ferrin MF, Subramaniam AR. Kinetic modeling predicts a stimulatory role for ribosome collisions at elongation stall sites in bacteria. *eLife* 6:e23629 (2017). [DOI](#)
11. Subramaniam AR, Zid B, O'Shea EK. An integrated approach reveals regulatory controls on bacterial translation elongation. *Cell* 159 1200 (2014). [DOI](#)
10. Subramaniam AR, DeLoughery A, Bradshaw N, Chen Y, O'Shea EK, Losick R, Chai Y. A serine sensor for multicellularity in a bacterium. *eLife* 2:e01501 (2013). [DOI](#)
9. Subramaniam AR, Pan T, Cluzel P. Environmental perturbations lift the degeneracy of the genetic code to regulate protein levels in bacteria. *PNAS* 110 2419 (2013). [DOI](#)
8. Obuse H, Subramaniam AR, Furusaki A, Gruzberg IA, Ludwig AWW. Conformal invariance, multifractality, and finite-size scaling at Anderson localization transitions in two dimensions. *Physical Review B* 82 035309 (2010). [DOI](#)
7. Subramaniam AR, Gruzberg IA, Ludwig AWW. Boundary criticality and multifractality at the 2D spin quantum Hall transition. *Physical Review B* 78 245105 (2008). [DOI](#)
6. Obuse H, Subramaniam AR, Furusaki A, Gruzberg IA, Ludwig AWW. Boundary multifractality at the integer quantum Hall plateau transition: implications for the critical theory. *Physical Review Letters* 101 116802 (2008). [DOI](#)
5. Obuse H, Subramaniam AR, Furusaki A, Gruzberg IA, Ludwig AWW. Corner multifractality for reflex angles and conformal invariance at 2D Anderson metal-insulator transition with spin-orbit scattering, *Physica E* 40 1404 (2008). [DOI](#)
4. Jia X, Subramaniam AR, Gruzberg IA, Chakravarty S. Entanglement entropy and multifractality at localization transitions. *Physical Review B* 77 014208 (2008). [DOI](#)
3. Obuse H, Subramaniam AR, Furusaki A, Gruzberg IA, Ludwig AWW. Multifractality and conformal invariance at 2D metal-insulator transition in the spin-orbit symmetry class. *Physical Review Letters* 98 156802 (2007). [DOI](#)
2. Mildenberger A, Subramaniam AR, Narayanan R, Evers F, Gruzberg IA, Mirlin AD. Boundary multifractality in critical 1D systems with long-range hopping. *Physical Review B* 75 094204 (2007). [DOI](#)
1. Subramaniam AR, Gruzberg IA, Ludwig AWW, Evers F, Mildenberger A, Mirlin AD. Surface criticality and multifractality at localization transitions. *Physical Review Letters* 96 126802 (2006). [DOI](#)