

## 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 Member 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

NSF CAREER Award 2019

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

Department of Medical Genetics, University of Washington, Seattle	2018
Department of Microbiology, University of Washington, Seattle	2017
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

Lead Instructor, MCB 517A: Tools for Computational Biology, University of Washington, Seattle	2018
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

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

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
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, eLife, Cell Reports, Nature Communications, Nature Microbiology, Physical Biology, Physical Review Letters, Physical Review B

Ad-hoc grant reviewer for United States-Israel Binational Foundation, Research Foundation – Flanders Belgium, Swedish Foundation for Strategic Research

## Extramural Research Support

### Current

NSF CAREER (PI) 2019–24  
Experimentally integrated modeling of quality control during eukaryotic mRNA translation  
100,000\$ direct costs per year

Sidney Kimmel Scholarship (PI) 2017–19  
Quantitative Profiling of Synonymous Mutation Effects in Cancer Cells  
100,000\$ total costs per year

NIH R35 GM119835 (PI) 2016–21  
Regulation of Protein Synthesis by Synonymous Codon Usage  
235,000\$ direct costs per year

### Completed

NIH K99/R00 GM107113 (PI) 2013–17  
Role of Synonymous Codon Usage as Gene Regulators in Bacteria and Cancer Cells  
680,000\$ total costs over 4 years

## Publications

(corresponding author is underlined)

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](#)