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Education

2011	Ph.D. Genetics, Bioinformatics and Computational Biology Dissertation: Mathematical modeling of pathways involved in cell cycle regulation and cell differentiation	Virginia Tech Blacksburg, VA
2006	B.Tech. Industrial Biotechnology Centre for Biotechnology	Anna University Chennai, India

Work Experience

Nov '20	Assistant Professor (Fixed-Term) Pathobiology and Diagnostic Investigation	Michigan State University East Lansing, MI
2018–Present	Senior Research Associate Pathobiology and Diagnostic Investigation	Michigan State University East Lansing, MI
2013–2017	Postdoctoral Research Associate Public Health Research Institute	Rutgers University Newark, NJ
Feb–Mar'17	Visiting Scientist National Center for Biotechnology Information	National Institutes of Health Bethesda, MD
Jan–Feb'15	Visiting Scientist Center for Cell Circuits	Broad Institute Boston, MA
2012–2013	Postdoctoral Research Associate Dept. of Mathematics	Rutgers University Piscataway, NJ
2006–2011	Graduate Research Assistant Dept. of Biology	Virginia Tech Blacksburg, VA
2005–2006	Student Researcher Bioinformatics Centre	Indian Institute of Science Bangalore, India

Research Keywords

Computational biology/bioinformatics | genomics/transcriptomics | molecular evolution and phylogeny | comparative pathogenomics | drug repurposing | infectious diseases

Publications

[*Contributed equally] [©Corresponding author]

[JRaviLab current/past members, underlined]

From Michigan State University

- Samart K*, Tuyishime P*, Krishnan A[©], **Ravi J[©]**. Reconciling multiple connectivity scores for drug repurposing. 2020 [[arXiv](#)] [[Live doc](#)] [[GitHub](#)] [*submitted to Briefings in Bioinformatics*]
- Chen SZ, Sosinski LM, **Ravi J[©]**. MolEvolvR: A molecular evolution and phylogeny web-app to characterize proteins. [*In preparation.*]
- Hadi SA, Kolte IV, Brenner EP, Gardy J, Cunha EAT, Ferrazoli L, Villela DA, Santos RS, **Ravi J**, Sreevatsan S, Basta PC. Discovery of a predominant and distinct lineage of Mycobacterium tuberculosis in Brazilian indigenous population. [*Under review in Scientific Reports.*]

- Lensmire JM, Dodson JP, Hsueh BY, Wischer MR, Delekta PC, Shook JC, Ottosen EN, Kies PJ, **Ravi J**, Hammer ND. The *Staphylococcus aureus* cystine transporters, TcyABC and TcyP, facilitate nutrient sulfur acquisition during infection. *Infection and Immunity*. 2019 Dec; epub. PMID: 31843961.

From Rutgers University

- **Ravi J**[©], Anantharaman V, Chen SZ, Datta, P, Aravind L[©], Gennaro ML[©]. Phage-shock-protein (Psp) Envelope Stress Response: Evolutionary History & Discovery of Novel Players. 2020. [[bioRxiv](#)] [[Webapp](#)]
- **Ravi J**^{*}, Kaufman G^{*}, Rey-Jurado E, Mehra S, Nikolaev EZ, Kaushal D, Sontag ED, Pine R, Tyagi S, Gennaro ML. Single-cell analysis of genes involved in lipid droplet accumulation in *Mycobacterium tuberculosis*-infected macrophages. *In preparation*.
- **Ravi J**, Anantharaman V, Aravind L, Gennaro ML. Variations on a theme: Evolution of the phage-shock-protein system in Actinobacteria. *Antonie Van Leeuwenhoek*. 2018 May;111(5):753-760. PMID: 29488183. [[GitHub](#)]
- Chauhan R, **Ravi J**, Datta P, Chen T, Schnappinger D, Bassler K, Balázsi G, Gennaro ML. (2016) Reconstruction and topological characterization of the sigma factor regulatory network of *Mycobacterium tuberculosis*. *Nature communications*. 7:11062. PMID: 27029515. [[GitHub](#)]
- Datta P, **Ravi J**, Guerrini V, Chauhan R, Hancioglu B, Igoshin O, Neiditch M, Gennaro ML. (2015) The Psp system of *Mycobacterium tuberculosis* integrates envelope stress sensing and envelope preserving functions. *Molecular Microbiology*. 97: 408-422. PMID: 25899163. [[GitHub](#)]
- Salamon H, Bruiners N, Lakehal K, Shi L, **Ravi J**, Yamaguchi KD, Pine R, Gennaro ML. (2014) Cutting Edge: Vitamin D regulates lipid metabolism in *Mycobacterium tuberculosis* infection. *Journal of Immunology* 193: 30-34. PMID: 24899504.

From Virginia Tech

- **Ravi J**[©], Tyson JJ[©]. Modeling the START transition in the budding yeast cell cycle. *Submitted*.
- Thorne C, **Ravi J**, Tyson JJ, Lee E. Feedback among components of the β -catenin destruction complex imparts discrete signal transduction and memory. *Submitted*. [Results hosted [here](#)]

Grants, Awards

Research Funding

- 2020 NIH R01 Sub-award. PI: Neal Hammer.
- 2019 Diversity Research Network, Launch Awards Program, Michigan State University.
- 2019 Harvey J Fiege Endowed Research Fund, College of Veterinary Medicine, Michigan State University.
- 2017 ORAU/ORISE Visiting Scientist Program at NCBI, NIH.
- 2015 Broad Institute Visiting Scientist Program at the Center for Cell Circuits.
- 2007 P.E.O. International Peace Scholarship: Graduate Research.
- **Also see the student scholarship section below.*

Conference

- 2018, 2020 ISMB: Conference registration grant award.
- 2017 ASM Tuberculosis: Travel grant award.

Teaching, Education, and Outreach

- All-University Excellence in Diversity Award, Michigan State University (for R-Ladies East Lansing).
- MSU Data Science Learning Community funded by the MSU Academic Advancement Network.
- Sponsorships for 15+ R-Ladies East Lansing meetups.
- Sponsorship for Women+ Data Science East Lansing @MSU symposia (2019, 2020).

Teaching/Workshops, Oral Presentations, Posters

Workshop & talks: jravilab.github.io/talk | *Upcoming; *Invited; ^VVirtual; #cancelled due to COVID-19.

Teaching, Workshops

- 2020-09: *Methods in phylogeny, pangenomes, genomics. *Integrated Microbial Biology, MSU, MI*
- 2020-05: *#Session on Data Visualization. *DANG! symposium, Univ of Michigan, MI*
- 2020-02: *Molecular Evolution and Phylogeny. *Chemistry and Biology of Pathogens, MSU, MI*
- 2019-09: *Best Practices for Computational Sciences: R for Reproducible Research. *Diversity Research Network Researcher's Workshop, MSU, MI*
- 2019-03: R for Genomics Workshop. *Indian Institute of Technology, Madras, India*
- 2019/20: *Tidyverse Workshop for Genomics. *R for Plant Genomics course, MSU, MI*
- 2018/19: Introduction to Tidy Data with R Workshop. *R-Ladies East Lansing, MI*
- 2018/19: Introduction to Data Visualization with R Workshop. *R-Ladies East Lansing, MI*

Co-organized Meetings

- 2020–Now: Women+ Data Science webinar series^V
- 2020-04: #Women+ Data Science Symposium at MSU, *East Lansing, MI*
- 2020-08: Conference on Computational Health. *Grand Rapids, MI*
- 2019-04: Women in Data Science Symposium *East Lansing, @MSU*
- 2018–Now: R-Ladies East Lansing workshops, meetups, and discussions, *MI*

Talks

- 2020-11: *Michigan Precollege & Youth Outreach Conference^V.
- 2020-08: BEACON Congress^V.
- 2020-07: Intelligent Systems for Molecular Biology, International Society for Computational Biology^V.
- 2019-09: *R for you! Diversity Research Network, MSU Inclusion. *MI*
- 2019-08: Conference on Computational Health. *Grand Rapids, MI* | Also, chaired one of the sessions.
- 2019-07: Gram-positive bacteria and bacilli meeting. *College Park, MD*
- 2019-05: *Chemistry and Biology of Pathogens. *MSU, MI*
- 2019-01: *Simple rules to make an effective scientific presentation. *CMIB seminar series, MSU, MI*
- 2018-07: ISMB 2018, *Chicago, IL*
- 2016-06: ASM Microbe 2016, *Boston, MA*
- 2014-10: *Institute for Mathematical Sciences, *Chennai, India*

Posters

- 2019-05: ASBMB Symposium on Evolution and Core Processes in Gene Expression. *Michigan State University, MI* | Also, chaired one of the sessions.
- 2017-07: ASM Tuberculosis, *New York, NY*
- 2015-11: Lipid Research Symposium at the Rutgers Center for Lipid Research, *Rutgers University, NJ*
- 2011-03: Computational Cell Biology Meeting. *Cold Spring Harbor Laboratories, NY*
- 2010-11: Signal Transduction and Gene Regulatory Networks Workshop. *Mathematical Biosciences Institute, OSU, OH*
- 2009-07: Gordon Research Conference on Cell Growth and Proliferation. *Colby College, ME*
- 2009-03: Computational Cell Biology Meeting. *Cold Spring Harbor Laboratories, NY*
- 2009-02: Biological Sciences Research Symposium. *Virginia Tech, VA*

Other Scientific Meetings

- 2014-09: Computational Genomics workshop. *Center for Cell Circuits, Broad Institute, MA*
- 2013-09: Biomarkers for Tuberculosis: New Questions, New Tools. *Chantilly, VA*
- 2010-05: The Cell Cycle Meeting. *Cold Spring Harbor Laboratories, NY*

- 2007-06: Joint meeting of the National Centers of Integrative and Systems Biology 2007. *Boston, MA*
- 2007-06: Summer Symposium on Systems Biology of Cancer. *Koch Institute for Integrative Cancer Research. MIT, MA*
- 2007-04: ASBMB Meeting. *Washington DC*

Professional Memberships, Services, Education, and Outreach

Scientific societies

- 2014 – 2015 Member, Postdoc Association, New York Academy of Sciences
- 2015 – Member, American Society of Microbiology
- 2018 – Member, International Society for Computational Biology; EvolCompGen COSI committee
Member, American Thoracic Society

Services

- 2019 – 2020 Member, CMSE Undergraduate Data Science Curriculum Committee
- 2019 – Grant Reviewer, Endowed Research Funds, College of Veterinary Medicine, MSU
- 2020 – Grant Reviewer, Diversity Research Network, MSU
- 2020 – Host, Writing Spaces for minority faculty, Diversity Research Network, MSU

Education and Outreach

- 2006 – 2011 Member and Co-organizer, Asha for Education, Virginia Tech
- 2018 – Founder and Co-organizer, [R-Ladies East Lansing](#)
* 500+ members; 1 national symposium; 2 K-12 events; 20+ workshops; \$10K+ funding
- 2018 – Member, R-Ladies Global; Women in Data Science; ROpenSci
- 2019 – Member, Data Carpentry | Genomics and Open Science Education teams
- 2019 – Co-founder and Co-organizer, [MSU Data Science](#) Learning Community
Co-founder and Co-organizer, [Women+ Data Science](#) initiative with MSU, UMich

Mentoring

Team Members (Current & Past)

Undergraduate Researchers (2019 – Present)

[Student initials referenced in the 'accomplishments' section below]

- Samuel Chen, SC Computer Science Engineering, MSU; Honors College
- Karn Jongnarangsin, KJ Human Biology (completed); Data Science; CSE, MSU
- Philip Calhoun, PC Human Biology, MSU; Drew Scholar; Honors College
- Kewalin Samart, KS Computational Mathematics; CMSE, MSU; Scholarship from BIOTEC, Thailand
- Elliot Majlessi, EM Biochemistry & Biotechnology, MSU
- Lauryn Brooks, LB Microbiology, Hampton University, VA
- Mary Zhang, MZ Biology, Carleton College, MN
- 2020 graduates:
 - Lauren Sosinski, LS Biochemistry & Biotechnology; Genomics & Molecular Genetics; CMSE, MSU
 - Phoebe Tuyishime, PT Nutritional Sciences; Global Public Health & Epidemiology, MSU
 (Mastercard Foundation Scholar; Justin S. Morrill Leadership Fellow)

Graduate Research (co-mentor)

- Joshua Lensmire and Paige Kies (PI: Dr. Neal Hammer, MSU); Alex Corrión (PI: Dr. Brad Day, MSU)

Team Member Accomplishments

- *Publications*
 - **SC & LS:** Chen SZ, Sosinski LM, Ravi J. MolEvolvR: An molecular evolution and phylogeny web-app to characterize proteins. *In preparation*.
 - **KS & PT:** Samart K*, Tuyishime P*, Krishnan A, Ravi J. Reconciling multiple connectivity scores for drug repurposing. 2020. [[arXiv](#)] [[Live doc](#)] [[GitHub](#)] [*submitted to Briefings in Bioinformatics*]
 - **SC:** Ravi J, Anantharaman V, Chen SZ, Datta, P, Aravind L, Gennaro ML. Phage-shock-protein (Psp) Envelope Stress Response: Evolutionary History & Discovery of Novel Players. 2020 [[bioRxiv](#)] [[Webapp](#)]
- *Funding/Scholarships*
 - **KJ & SC.** 2020: REU/ACRES (NSF-funded) Summer scholarship.
 - **PC.** 2020: BRUSH/NIH summer scholarship; 2019: SROP Summer and BEACON fellowships.
 - **KS.** 2020: College of Natural Science scholarship for Spring and Summer.
 - **LB.** 2020: NSURP BIPOC Summer research program for microbiology, 2020.
 - **PT.** 2019: Contributed to now funded DRN Launch Awards Program grant proposal.
- *Student posters/talks*

[^VVirtual; *received honorary mention for their posters; #cancelled due to COVID-19]

 - **EM, PC.** [TALKS] 2020: Phi Zeta Research Symposium^V
 - **SC, KJ.** [TALKS] 2020: Talks at BEACON Congress^V
 - **PC.** 2020: National Veterinary Scholars Symposium, AAVMC^V
 - **SC, KJ, KS, PC, EM, LS.** Mid-Michigan Symposium for Undergraduate Research Experience^V
 - **SC*, KJ*, PT, PC.** 2020: ISMB (International Society for Computational Biology conference)^V
 - **SC, PT, KJ, PC, LS.** 2020#: Women+ Data Science at MSU, *East Lansing, MI*
 - **PC.** 2019: Phi Zeta Research Symposium, College of Veterinary Medicine, Michigan State University; Mid-Michigan Symposium for Undergraduate Research Experiences, *East Lansing, MI*
 - **LS.** 2019: Women in Data Science Symposium East Lansing @ Michigan State University; University Undergraduate Research and Arts Forum (UURAF), *East Lansing, MI*
- *Career next steps*
 - **PT:** Mastercard Foundation Scholarship for Masters in Public Health, University of British Columbia, Canada. Also accepted to fully-funded PhD programs at Purdue University, Emory University, UC Davis.
 - **LS:** Post-baccalaureate program with Biochemistry, Michigan State University.