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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

Professional Appointments

2021–	Assistant Professor (Tenure-Track) Pathobiology and Diagnostic Investigation Microbiology and Molecular Genetics	Michigan State University East Lansing, MI
2021–2021	Assistant Professor (Fixed-Term) Pathobiology and Diagnostic Investigation	Michigan State University East Lansing, MI
2018–2020	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

Research Keywords

Computational biology, Bioinformatics, Clinical informatics | Molecular evolution and phylogeny | Comparative genomics and transcriptomics | Drug repurposing | Infectious diseases | R education and community | Open science

Publications

[*Contributed equally] [©Corresponding author]

[JRaviLab current/past members, underlined]

Publications: jrvilab.github.io/publication/ | Software and Data: jrvilab.org, github.com/jrvilab | [ORCID](https://orcid.org/)

In preparation

- Burke JT*, Chen SZ*, Sosinski LM*, Johnston JB, **Ravi J**©. MolEvolvR: A webapp for characterizing proteins using molecular evolution and phylogeny. [Webapp] *Co-primary, listed alphabetically.
- **Ravi J**©, Samart K, Zwolak J, Tyson JJ©. Modeling the START transition in the budding yeast cell cycle. [Model]

Preprints/Submitted manuscripts

- Joo R*, Sánchez-Tapia A*, ... **Ravi J**. Ten simple rules to host an inclusive conference. 2022 [submitted] [GitHub]
- Conner KN*, Burke JT*, **Ravi J**©, Hardy JW©. Novel Internalin P homologs in *Listeria ivanovii londoniensis* and *Listeria seeligeri*. 2022 [submitted] [bioRxiv] [GitHub]
- Blaine HC*, Burke JT*, **Ravi J**©, Stallings CL©. DciA helicase operators exhibit diversity across bacterial phyla. 2022 [submitted] [bioRxiv] [GitHub]

- Cantoria MJ^{*}, Alizadeh E^{*}, **Ravi J**, Bunnag N, Kettenbach N, Ahmed Y, Paek AL, Tyson JJ, Doubrovinski K[®], Lee E[®], Thorne C[®]. Feedback in the β -catenin destruction complex imparts bistability and cellular memory. 2021 [submitted]
- Lensmire JM, Wischer M, Sosinski LM, Ensink E, Dodson JP, Shook JC, Delekta PC, Cooper C, Havliccheck Jr D, Mulks M, Lunt SY, **Ravi J**, Hammer ND. The glutathione import system satisfies the *Staphylococcus aureus* nutrient sulfur requirement and promotes interspecies competition. 2021 [bioRxiv]
- Hsueh BY^{*}, Severin GB^{*}, ... **Ravi J**, Top EM, and Waters CM. A Broadly Conserved Deoxycytidine Deaminase Protects Bacteria from Phage Infection. 2021 [submitted] [bioRxiv] [Data]
- **Ravi J**[®], Anantharaman V, Chen SZ, Datta, P, Aravind L[®], Gennaro ML[®]. Phage-shock-protein (PSP) Envelope Stress Response: Evolutionary History and Novel Players. 2020. [submitted] [bioRxiv] [Webapp]

Published papers

- Samart K^{*}, Tuyishime P^{*}, Krishnan A[®], **Ravi J**[®]. Reconciling multiple connectivity scores for drug repurposing. *Briefings in Bioinformatics*. 2021;22(6):bbab161. [PubMed] [Live doc] [GitHub]
- **Ravi J**[®], Fioravanti A[®]. S-layers: the proteinaceous multifunctional armours of Gram-positive pathogens. *Frontiers in Microbiology*. 2021;12:685. [PubMed]
- Hadi SA, Kolte IV, Brenner EP, Cunha EAT, Simonsen V, Ferrazoli L, Villela DAM, Santos RS, **Ravi J**, Sreevatsan S, Basta PC. Identification of a predominant genotype of *Mycobacterium tuberculosis* in Brazilian indigenous population. *Scientific Reports*. 2021;11(1):1224. [PubMed]
- 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;88(3):e00690-19. [PubMed]

Pre-MSU

- **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;111(5):753-760. [PubMed] [GitHub]
- Chauhan R, **Ravi J**, Datta P, Chen T, Schnappinger D, Bassler K, Balázs G, Gennaro ML. Reconstruction and topological characterization of the sigma factor regulatory network of *Mycobacterium tuberculosis*. *Nature communications*. 2016. 7:11062. [PubMed] [GitHub]
- Datta P, **Ravi J**, Guerrini V, Chauhan R, Hancioglu B, Igoshin O, Neiditch M, Gennaro ML. The Psp system of *Mycobacterium tuberculosis* integrates envelope stress sensing and envelope preserving functions. *Molecular Microbiology*. 2015. 97: 408-422. [PubMed] [GitHub]
- Salamon H, Bruiners N, Lakehal K, Shi L, **Ravi J**, Yamaguchi KD, Pine R, Gennaro ML. Vitamin D regulates lipid metabolism in *Mycobacterium tuberculosis* infection. *J. Immunology*. 2014 193: 30-34. [PubMed]

Grants, Awards

Research Funding/Awards

[*Also, see Mentee Accomplishments section below.]

Pending support

- 2022–2024 (PI) NIH NIAID R21: “Cross-database integration using evolution and machine learning to identify multiscale molecular building blocks for antibiotic resistance.”
- 2022–2027 (PI) NIH NIGMS R35 MIRA resubmission of previously scored proposal: “Computational approaches for multiscale data integration to reveal the molecular underpinnings of microbial phenotypes and diseases.”
- 2022–2024 (co-PI) NIH NIAID R21: “Mechanism-guided drug repurposing for host-directed therapy of infectious diseases using interpretable and integrative ML”

Ongoing support

- 2021–2023 (PI) Sheila McMonagle Endowed Research Fund, College of Veterinary Medicine, MSU
- 2021–2022 (PI) NSF-funded BEACON Center

- 2021–2022 (co-I) Spectrum Health and MSU Alliance
- 2020–2022 (Collaborator) NIH NIAID R01 subaward
- 2019–2021 (PI) Harvey J Fiege Endowed Research Fund, College of Veterinary Medicine, MSU

Completed support

- 2019–2020 (PI) Diversity Research Network, Launch Awards Program, Michigan State University

Conference Registration Awards

- 2021 useR!
- 2018, 2020, 2021 ISMB

Education and Outreach Award

- 2020 All-University Excellence in Diversity Award, MSU (for R-Ladies East Lansing).

Education and Outreach Funding

- 2019–2020 MSU Data Science Learning Community funded by the MSU Academic Advancement Network.
- 2018– Sponsorships for 25+ R-Ladies East Lansing meetups.
- 2019– Sponsorship for Women+ Data Science East Lansing @MSU symposia.

Pre-MSU

Research Awards

- 2017 ORAU/ORISE Visiting Scientist Program at NCBI, NIH.
- 2015 Broad Institute Visiting Scientist Program at the Center for Cell Circuits.
- 2007 PEO International Peace Scholarship for Graduate Research.

Conference Travel Awards

- 2017 ASM Tuberculosis

Teaching/Workshops, Talks, Posters

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

Research Talks

- 2021-11 ‡University of Colorado, School of Medicine, Center for Health AI
- 2021-07 Intelligent Systems for Molecular Biology, International Society for Computational Biology
- 2021-07 useR! 2021, The R Conference | Also, pitched and moderated two incubators.
- 2021-05 Great Lakes Bioinformatics Conference
- 2021-03 BEACON webinar series
- 2020-08 BEACON Congress
- 2020-07 Intelligent Systems for Molecular Biology, International Society for Computational Biology
- 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*
- 2018-07 ISMB 2018, *Chicago, IL*

Posters

- 2021-09 Latin American Congress of Women in Bioinformatics and Data Science
- 2021-08 BioC2021, The R Bioconductor Virtual Conference
- 2019-05 ASBMB Symposium on Evolution and Core Processes in Gene Expression. *Michigan State University, MI* | Also, chaired one of the sessions.

Invited Panels, Talks

- 2021-11 ‡Bringing diversity to and building a strong AsiaR community. *BioC Asia 2021 (Japan/virtual)*.
- 2021-09 ‡Midwest Microbial Pathogenesis Conference (MMPC), Session Chair. *East Lansing, MI*
- 2021-04 ‡R-Ladies+: Bringing diversity to the global useR! 2021 conference (P)
- 2020-11 ‡Michigan Precollege & Youth Outreach Conference (P)

- 2019-09 ‡R for you! Diversity Research Network, MSU Inclusion. *MI*
- 2019-01 ‡Simple rules to make an effective scientific presentation. *CMIB seminar series, MSU, MI*

Invited Workshops/Teaching

- 2022-05 ‡*Writing manuscripts with R. *R-Ladies Dallas (US)*.
- 2022-02 ‡*Intro to R. *Global Alliance for Rapid Diagnostics*.
- 2022-02 ‡*‘How I teach Life Scientists’ series. *Life Science Training Institute (Australia)*.
- 2021-05 ‡Making publication-quality tables w/ R. *R-Ladies Pune (India)*.
- 2021-04 ‡Using Tidyverse for Genomics. *R-Ladies Tunis (Africa), R-Ladies Bangalore (India)*.
- 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*
- 2020/19 ‡Tidyverse Workshop for Genomics. *R for Plant Genomics course, MSU, MI*
- 2019-09 ‡Best Practices for Computational Sciences: R for Reproducible Research. *Diversity Research Network Researcher’s Workshop, MSU, MI*

Co-organized Meetings

- 2021– Why R? Foundation webinars: R-Ladies takeover, for global URM speakers
- 2020– Women+ Data Science webinar series and panel discussions
- 2020 #Women+ Data Science Symposium at MSU, *East Lansing, MI*
- 2020 Conference on Computational Health. *Grand Rapids, MI*
- 2019 Women in Data Science Symposium *East Lansing, @MSU*
- 2018– R-Ladies East Lansing workshops, meetups, and discussions, *MI*

Other Incubators (panels), Workshops

- 2021-07 Strategies to build a strong AsiaR community. *useR! 2021, The R conference (Inc.)*
- 2021-07 Stop reinventing the wheel: R package for conference/abstract management. *useR! 2021 (Inc.)*
- 2019-03 R for Genomics Workshop. *Indian Institute of Technology, Madras, India*
- 2019/18 Introduction to Tidy Data with R Workshop. *R-Ladies East Lansing, MI*
- 2019/18 Introduction to Data Visualization with R Workshop. *R-Ladies East Lansing, MI*

Pre-MSU

Research Talks

- 2016-06 ASM Microbe 2016, *Boston, MA*
- 2014-10 ‡Institute for Mathematical Sciences, *Chennai, India*

Posters

- 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*

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

Membership in Scientific Societies, Research/Education Communities

- 2019 – Data Carpentry | Genomics and Open Science Education teams | R/Bioconductor
- 2018 – International Society for Computational Biology
- 2018 – R-Ladies Global | Women in Data Science | rOpenSci

Academic Services

- 2021 – Review Editor, Editorial Board, *Frontiers in Bioinformatics* and *Frontiers in Systems Biology*
Reviewer, *PLoS Computational Biology*, *PLoS One*, *ASM Applied and Environmental Microbiology*, *Life Science Alliance*, *Frontiers in Bioinformatics*
- 2020 – Grant Reviewer, Diversity Research Network, MSU
- 2019 – Grant Reviewer, Endowed Research Funds, College of Veterinary Medicine, MSU
- 2019 – Abstract Reviewer, ISMB 2019–2022; Great Lakes Bioinformatics 2021
- 2019 – 2020 Member, CMSE Undergraduate Data Science Curriculum Committee

Conference Committees/Leadership

- 2021 – 2022 COSI Co-Chair, Track, and Awards Chair, *EvolCompGen COSI*, *ISMB 2022*
- 2020 – 2021 Program Committee Chair, [useR! 2021](#) (the global R conference)
- 2020 – 2021 Abstract Chair, Track Lead, and Awards Chair, *EvolCompGen COSI*, [ISMB 2021](#)
- 2018 – Core *EvolCompGen* committee member, *Intelligent Systems for Molecular Biology (ISMB)*
the flagship conference of the International Society for Computational Biology
- 2019 – 2020 Poster Awards Chair, *EvolCompGen*, *ISMB 2020*

Leadership in Education and Outreach

- 2021 – Co-founder, [AsiaR](#)
- 2019 – Co-founder and Co-organizer, [Women+ Data Science](#) initiative with MSU, UMich
- 2019 – 2021 Co-founder and Co-organizer, [MSU Data Science](#) Learning Community
- 2018 – Founder and Co-organizer, [R-Ladies East Lansing](#)
* 650+ members; 1 national symposium; 2 K-12 events; 30+ workshops; \$10K+ funding
* Received the 2020 All-University Excellence in Diversity Award, Michigan State University.

Pre-MSU

Scientific Societies, Education and Outreach/Leadership

- 2015 – Member, American Society of Microbiology
- 2014 – 2015 Member, Postdoc Association, New York Academy of Sciences
- 2006 – 2011 Member and Co-organizer, Asha for Education, Virginia Tech

Mentoring (at MSU)

Mentees (2019–Present)

- | | |
|---|---|
| <ul style="list-style-type: none"> • Kewalin Samart, KS • Elliot Majlessi, EM • Vignesh Sridhar, VS • Joseph Burke, JB • Ethan Wolfe, EW • Amy Tonielli, AT • Mary Zhang, MZ | <p>[Student initials referenced in the ‘<i>Mentee accomplishments</i>’ section below]</p> <p>Computational Mathematics; CMSE, MSU; Scholarship from BIOTEC, Thailand</p> <p>Biochemistry & Biotechnology, MSU</p> <p>Data Science and Analytics, St. Clair College, Ontario, Canada</p> <p>Genomics and Molecular Genetics; Computer Science, MSU</p> <p>Biochemistry & Molecular Biology; Pharmacology & Toxicology; CMSE, MSU</p> <p>Biomedical Laboratory Sciences, MSU</p> <p>Biology, Carleton College, MN</p> |
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Alumni

- Samuel Chen, SC Computer Science Engineering, MSU
- Philip Calhoun, PC Human Biology, MSU; Drew Scholar; Honors College
- Phoebe Tuyishime, PT Nutritional Sciences; Global Public Health & Epidemiology, MSU; Mastercard Foundation Scholar; Justin S. Morrill Leadership Fellow
- Lo Sosinski, LS Biochem. & Biotech.; Genomics & Mol Genetics; CMSE, MSU
- Karn Jongnarangsin, KJ Human Biology ('19); Data Science; CSE, MSU
- Lauryn Brooks, LB Microbiology, Hampton University, VA
- Larissa Ford, LF Biochemistry & Biotechnology; CMSE, MSU

Mentee Accomplishments

- *Publications* [indicated in the Publications section above; mentees underlined]
- *Funding/Scholarships*
 - **EW, AT** 2021: Professorial Assistantship Program, Honors College, MSU (given to the Top200 students)
 - **KS** 2021: Engineering Summer Undergraduate Research Experience (EnSURE), MSU
2020–2021: College of Natural Science scholarships for Spring, Summer, Fall '20; Spring, Fall '21.
 - **EM** 2021: NIH R25-funded BRUSH Summer scholarship
 - **KJ, SC** 2020: NSF-funded REU/ACRES Summer scholarship.
 - **PC** 2020: NIH BRUSH Summer scholarship; 2019: SROP and NSF-funded BEACON fellowships.
 - **LB** 2020: NSURP BIPOC Summer research program for microbiology.
 - **PT** 2019: Contributed to the now funded DRN Launch Awards Program grant proposal.
- *Presentations* [*honorable mention; \$best poster award+cash prize; ¥best talk; #canceled due to COVID-19]
International/National meetings
 - **JB, EM, VS, KC** [co-mentored student]. 2021: Midwest Microbial Pathogenesis Conference (MMPC)
 - **KS** [TALK]. 2021: Latin American Congress of Women in Bioinformatics and Data Science
 - **JB, EM, VS.** 2021: BEACON Congress
 - **EM.** 2021: National Veterinary Scholars Symposium, AAVMC
 - **KS** [TALK], **VS**^{\$}, **EM**^{*}. 2021: ISMB (International Society for Computational Biology conference)
 - **KS** [TALK]. 2021: R-Ladies Pune
 - **SC, KS.** 2021: Great Lakes Bioinformatics Conference (GLBIO)
 - **SC, KJ.** [TALKS]. 2020: BEACON Congress
 - **PC.** 2020: National Veterinary Scholars Symposium, AAVMC
 - **SC**^{*}, **KJ**^{*}, **PT, PC.** 2020: ISMB (International Society for Computational Biology conference)
 - **SC, PT, KJ, PC, LS.** 2020[#]: Women+ Data Science at MSU, *East Lansing, MI*
 - **LS.** 2019: Women in Data Science Symposium East Lansing @MSU; UURAF, *East Lansing, MI*Regional/University-wide symposia
 - **KS, EM.** 2021: Mid-Michigan Symposium for Undergraduate Research Experience
 - **SC** [TALK], **PC, EM, KS.** 2021: Undergraduate Research and Arts Forum (UURAF), *East Lansing, MI*
 - **SC, JR.** [TALK]. 2021: BEACON Spring 2021 seminar series
 - **EM, PC**[¥]. [TALKS]. 2020: Phi Zeta Research Symposium
 - **SC, KJ, KS, PC, EM, LS.** 2020: Mid-Michigan Symposium for Undergraduate Research Experience
 - **PC.** 2019: Phi Zeta Research Symposium, College of Veterinary Medicine, Michigan State University; Mid-Michigan Symposium for Undergraduate Research Experiences, *East Lansing, MI*
- *Alumni outgoing achievements (career next steps)*
 - **VS:** (2021) Now Asst. Vice President at BNP Paribas, Montreal, Canada.
 - **SC:** (2021) Now at Amazon Inc. in 2022.
 - **PC:** (2021) Now pursuing a medical degree at MSU College of Human Medicine. Received 4 other admits.
 - **LS:** (2020) Now pursuing PhD at MSU (BMS/BMB program).
 - **PT:** (2020) Now a Mastercard Foundation Scholar for MS in Public Health, Univ of British Columbia, Canada. Received admits to 3 other fully-funded PhD programs.