

Work Experience

Senior Research Associate Pathobiology and Diagnostic Investigation, Michigan State University, East Lansing, MI	2018–Present
Postdoctoral Research Associate Public Health Research Institute, Rutgers University, Newark, NJ	2013–2017
Visiting Scientist National Center for Biotechnology Information, National Institutes of Health, Bethesda, MD	Feb–Mar ‘17
Visiting Scientist Broad Institute, Boston, MA	Jan–Feb ‘15
Postdoctoral Research Associate Dept. of Mathematics, Rutgers University, Piscataway, NJ	2012–2013
Graduate Research Assistant Virginia Tech, Blacksburg, VA	2006–2011

Education

Ph.D. Genetics, Bioinformatics and Computational Biology Virginia Tech, Blacksburg, VA Dissertation: <i>Mathematical modeling of pathways involved in cell cycle regulation and cell differentiation</i>	2006–2011
B.Tech. Industrial Biotechnology Anna University, Chennai, India	2002–2006

Research Interests

- Unraveling molecular mechanisms common between genetic and infectious diseases, to guide targeted drug repurposing
- Identifying genomic signatures, functions, and mechanisms relevant to host-pathogen interactions, to enable understanding and guide diagnosis
- Developing tools and resources for seamlessly relating sequence, structure, and function of genes/proteins in poorly characterized pathogens to enable and guide better prevention, diagnostic and treatment regimen
- Mathematical/statistical modeling of signaling and regulatory networks: host-pathogen interactions, metabolic pathways, and cellular processes.

Publications

#Corresponding author; *Contributed equally.

From Michigan State University

- Samart K*, Tuyishime P*, Krishnan A#, **Ravi J#**. Reconciling multiple connectivity scores for drug repurposing. *In preparation*. [GitHub](#)
- Chen SZ, Sosinski LM, **Ravi J#**. MolEvolVR: An molecular evolution and phylogeny web-app to characterize proteins. *In preparation*. [Web-app](#) (*molevolvr*, *cpathogeno2019*)

- Kolte IV, Hadi SA, 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. *Submitted to 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[#]. Conservation and modularity in the phage shock protein stress response system. *In preparation*. [Web-app](#) (*pspevolution*, *cpathogeno2019*)
- **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, Balázs 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*.

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: jrvilab.github.io/talk | *upcoming; #cancelled due to COVID-19.

Teaching, Workshops

- Three lectures on Methods in phylogeny, pangenomes, genomics, *Integrated Microbial Biology course (invited)*, MSU (Sep* '20)
- Session on Data Visualization. *DANG! symposium (invited)*, Univ of Michigan, Ann Arbor, MI (May '20#)
- Computational Approaches for Host-Pathogen Biology. *Chemistry and Biology of Pathogens course (invited)*, MSU (Feb '20)
- Best Practices for Computational Sciences: R for Reproducible Research. *Diversity Research Network Researcher's Workshop (invited)*, MSU (Jan '20)
- R for Genomics Workshop. *Indian Institute of Technology, Madras, India* (Mar '19)
- Tidyverse Workshop for Genomics. *R for Plant Genomics course (invited)*, MSU (Feb '20, '19)
- Introduction to Tidy Data with R Workshop. *R-Ladies East Lansing* (Nov '18)
- Introduction to Data Visualization with R Workshop. *R-Ladies East Lansing* (Oct '18)

Co-organized Meetings

- Women+ Data Science Symposium at MSU, *East Lansing, MI* (Apr '20#, Apr '10)
- Conference on Computational Health. *Grand Rapids, MI* (Aug '19)
- Women in Data Science Symposium *East Lansing, @MSU* (Apr '19)
- R-Ladies East Lansing workshops, meetups, and discussions (Jul '18 – now)

Talks

- Michigan Precollege & Youth Outreach Conference (*invited*). (Nov '20*)
- BEACON Congress (*contributed talk*). (Aug '20*)
- Intelligent Systems for Molecular Biology 2020, International Society for Computational Biology. (Jul '20)
- R for you! (*invited*) Diversity Research Network, MSU Inclusion. *East Lansing, MI* (Sep '19)
- Conference on Computational Health. *Grand Rapids, MI* (Aug '19) | Also, chaired one of the sessions.
- Gram-positive bacteria and bacilli meeting. *College Park, MD* (July '19)
- Chemistry and Biology of Pathogens (*invited*). *East Lansing, MI* (May '19)
- Simple rules to make an effective scientific presentation. *CMIB seminar series (invited)*, MSU (Jan '19)
- ISMB 2018, *Chicago, IL* (July '18)
- ASM Microbe 2016, *Boston, MA* (June '16)
- Institute for Mathematical Sciences, *Chennai, India* (October '14)

Posters

- ASBMB Symposium on Evolution and Core Processes in Gene Expression. *Michigan State University, East Lansing, MI* (May '19) | Also, chaired one of the sessions.
- ASM Tuberculosis '17, *New York, NY* (April '17)
- Lipid Research Symposium at the Rutgers Center for Lipid Research, *Rutgers University, New Brunswick, NJ* (November '15)
- Computational Cell Biology Meeting. *Cold Spring Harbor Laboratories, Long Island, NY* (March '11)
- Signal Transduction and Gene Regulatory Networks Workshop. *Mathematical Biosciences Institute, OSU, Columbus, OH* (November '10)
- Gordon Research Conference on Cell Growth and Proliferation. *Colby College, Waterville, ME* (July '09)
- Computational Cell Biology Meeting. *Cold Spring Harbor Laboratories, Long Island, NY* (March '09)
- Biological Sciences Research Symposium. *Virginia Tech, Blacksburg, VA* (February '09)

Other Scientific Meetings

- Computational Genomics workshop. *Center for Cell Circuits, Broad Institute, Boston, MA* (Sep '14)
- Biomarkers for Tuberculosis: New Questions, New Tools. *Chantilly, VA* (Sep '13)
- The Cell Cycle Meeting. *Cold Spring Harbor Laboratories, Long Island, NY* (May '10)
- Joint meeting of the National Centers of Integrative and Systems Biology 2007. *Boston, MA* (Jun '07)
- Summer Symposium on Systems Biology of Cancer. *Koch Institute for Integrative Cancer Research. MIT, Boston, MA* (Jun '07)
- ASBMB Meeting. *Washington DC* (Apr-May '07)

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](#)
* 400+ members; 1 national symposium; 2 K-12 events; 15+ 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

Undergraduate Researchers (2019 – Present)

- Samuel Chen^{1,2} (Computer Science Engineering; Honors College)
- Lauren Sosinski¹ (Biochemistry & Biotechnology; Genomics and Molecular Genetics; CMSE; 2020 graduate)
- Karn Jongnarangsin² (Human Biology (completed); Data Science; CSE)
- Philip Calhoun³ (Human Biology; Drew Scholar; Honors College)
- Phoebe Tuyishime^{4,5} (Nutritional Sciences; Global Public Health & Epidemiology
Mastercard Foundation Scholar; Justin S. Morrill Leadership Fellow; 2020 graduate)
- Kewalin Samart⁴⁻⁶ (Computational Mathematics; CMSE; Scholarship from BIOTEC, Thailand)
- Elliot Majlessi (Biochemistry & Biotechnology)
- Laurn Brooks⁷ (Microbiology, Hampton University)

Funding/Umbrella programs: ¹Endowed Research Fund; ²REU-ACRES fellowship; ³SROP/BEACON/BRUSH fellowship; ⁴DRN Launch Awards; ⁵Co-mentor: Dr. Arjun Krishnan; ⁶College of Natural Science scholarship; ⁷NSURP for Microbiology.

Graduate Research (co-mentor)

- Joshua Lensmire (PI: Dr. Neal Hammer; 2018—Present); Alex Corron (PI: Dr. Brad Day; 2018—19)

Student accomplishments

- *Upcoming publications*
 - KS & PT:** Samart K*, Tuyishime P*, Krishnan A, Ravi J. Reconciling multiple connectivity scores for drug repurposing. *In preparation*. [GitHub](#)
 - SC & LS:** Chen SZ, Sosinski LM, Ravi J. MolEvolVR: An molecular evolution and phylogeny web-app to characterize proteins. *In preparation*. [Web-app](#) (*molevolvr*, *cpathogeno2019*)
 - SC:** Ravi J, Anantharaman V, Chen SZ, Datta, P, Aravind L, Gennaro ML. Conservation and modularity in the phage shock protein stress response system. *In preparation*. [Web-app](#) (*pspevolution*, *cpathogeno2019*)
- *Funding/Scholarships*
 - Karn Jongnarangsins & Samuel Chen: REU/ACRES (NSF-funded) summer scholarship, 2020.
 - Philip Calhoun: BRUSH/NIH summer scholarship, 2020; SROP summer fellowship, 2019; BEACON fellowship, 2019.
 - Kewalin Samart: College of Natural Science scholarship for Spring and Summer 2020.
 - Lauryn Brooks: NSURP BIPOC summer research program for microbiology, 2020.
 - Phoebe Tuyishime: Contributed to now funded DRN Launch Awards Program grant proposal, 2019.
- *Student posters/talks*

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

 - SC, KJ: Talks at BEACON Congress (Aug '20)
 - PC: National Veterinary Scholars Symposium, AAVMC (Aug '20)
 - SC, KJ, KS, PC, EM, LS: Mid-Michigan Symposium for Undergraduate Research Experience (Aug '20)
 - SC*, KJ*, PT, PC: ISMB 2020 (International Society for Computational Biology flagship conference), Virtual (Jul '20)
 - SC, PT, KJ, PC, LS: Women+ Data Science at MSU, East Lansing, MI (Apr '20#)
 - PC: Phi Zeta Research Day, College of Veterinary Medicine, Michigan State University (Oct '19)
 - PC: Mid-Michigan Symposium for Undergraduate Research Experiences (Jul '19)
 - LS: Women in Data Science Symposium East Lansing @ Michigan State University (Apr '19); University Undergraduate Research and Arts Forum (UURAF) (Mar '19)
- *Career next steps*
 - Phoebe Tuyishime: 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.
 - Lauren Sosinski: Post-baccalaureate program with Biochemistry, Michigan State University.