Kewalin **Samart**

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Education

Michigan State University (MSU)   *East Lansing, MI*

B.Sc. in Computational Mathematics; Minor in Computational Math, Science, and Engineering   *May 2022 (Expected)*

- Cumulative GPA: 3.97/4.00; Major GPA: 4.00/4.00
- Dean's Honor List: Fall 2018 – present
- Royal Thai Government Scholarship Recipient 2017
- Relevant Courses: Calculus I-II, Multivariable Calculus, Differential Equations, Linear Algebra, Numerical Analysis, Analysis, Abstract Algebra, Introduction to Programming: Python, C++, Introduction to Computational Modeling and Data Analysis, Statistics for Scientists, Probability and Statistics, Cell and Molecular Biology, Organisms and Population Biology, Plant Biology

Skills

Programming Languages	R, Python, C++, TeX
Computational Tools	Git, vi, Terminal, Unix/Linux, High-performance/ Cluster computing, LaTeX

Research/ Teaching Experience

JRavi Lab; PI: Dr. Janani Ravi, Ph.D.   *Dec 2019 – present*

MSU Department of Pathobiology and Diagnostic Investigation   *East Lansing, MI*

   Undergraduate researcher in computational biology

Krishnan Lab; PI Dr. Arjun Krishnan, Ph.D.   *Mar 2021 – present*

MSU Deperment of Computational Mathematics, Science, and Engineering   *East Lansing, MI*

   Undergraduate researcher in computational biology

CMSE 202: Computational Modeling and Data Analysis II   *Spring 2022 (Starting Jan 2022)*

MSU Deperment of Computational Mathematics, Science, and Engineering   *East Lansing, MI*

   Undergraduate learning assistant (ULA)

Research Projects

A computational approach to repurpose drugs against infectious diseases – NIH funded

- **Mentors:** *Dr. Janani Ravi and Dr. Arjun Krishnan*
- Reconciled multiple connectivity-based methods for drug repurposing and published the work in *Briefings in Bioinformatics*.
- Design and develop a computational framework for host-directed gene expression-based drug repurosing in infectious diseases.
- Write custom R scripts to programmatically obtain and uniformly process disease and drug gene expression data (for both microarray and RNA-seq data) from public gene expression databases e.g. GEO, ARCHS4, LINCS, CMap.
- Perform differential expression analyses using limma, DEseq2 packages to construct disease signatures.
- Integrate the reconciled multiple connectivity-based metrics in Samart, Tuyishime, et al. 2021. to identify efficacious drug candidates for tuberculosis.

Modeling the START transition in the budding yeast cell cycle

- **Mentor:** *Dr. Janani Ravi*
- Contribute to the mathematical model built on over 100 differential equations and 200 parameters to represent the critical decision point in cell division of the budding yeast cell cycle.
- Simulate about 150 mutant phenotypes using SBML (Systems Biology Markup Language) for model manipulation and PET (the Parameter Estimation Toolkit) for model simulations with our new parameter set.
- Generate all the final cartoon depictions of the cell cycle model, simulation plots, and tables and finalize the manuscript for submission (Ravi, Samart, et al.,; will be submitted to *bioRxiv* by Dec 2021).

Publications

- **Kewalin Samart**[**], Phoebe Tuyishime[**], Arjun Krishnan[*], Janani Ravi[*]. Reconciling multiple connectivity scores for drug repurposing. *Briefings in Bioinformatics*(2021) doi.org/10.1093/bib/bbab161; [**]co-primary authors; [*]corresponding authors GitHub: github.com/jravilab/connectivity_scores; Live doc: jravilab.github.io/connectivity_scores
- Janani Ravi, **Kewalin Samart**, Jason Zwolak, John Tyson. Modeling the START transition in the budding yeast cell cycle. *In preparation*. Online simulator: http://sbmlsimulator.org/simulator/by-start

Presentations

Research/Technical Talks

- 2nd Latin American Congress of Women in Bioinformatics and Data Science (WBDS LA). Virtual, Sep. 23, 2021.

- 29th Conference on Intelligent Systems for Molecular Biology and the 20th European Conference on Computational Biology (ISMB/ECCB). Virtual, Jul. 25, 2021.
- R-Ladies Pune. Virtual, May. 9, 2021. Presentation material: github.com/KewalinSamart/Rladies-lightning-talk-distill

Poster Presentations

- 2nd Latin American Congress of Women in Bioinformatics and Data Science (WBDS LA). Virtual, Sep. 22 – 24, 2021.
- 2021 Mid-Michigan Symposium for Undergraduate Research Experiences (Mid-SURE). Virtual, Jul. 28, 2021.
- 29th Conference on Intelligent Systems for Molecular Biology and the 20th European Conference on Computational Biology (ISMB/ECCB). Virtual, Jul. 25 – 30, 2021.
- 2021 Great Lakes Bioinformatics Conference (GLBIO). Virtual, May 10 – 13, 2021.
- 2021 University Undergraduate Research and Arts Forum (UURAF). Virtual, Apr. 15 – 19, 2021.
- 2020 Mid-Michigan Symposium for Undergraduate Research Experiences (Mid-SURE). Virtual, Aug. 10 , 2020.

Podcast Interview

- Repurposing drugs for diseases. The Sci-Files on Impact 89FM Episode 11 Season 6, Aug. 1, 2021.
Podcast: https://impact89fm.org/101365/podcasts/the-sci-files-08-01-2021-kewalin-samart-repurposing-drugs-for-diseases/

Relevant Coursework Projects

Modeling oxygen repopulation in the body Python; Built an agent-based model to simulate how blood cells repopulate oxygen in the body focusing on modeling blood moving through veins/arteries.

Electricity generation and climate change in the United States Python; Conducted regression analysis to determine the relationship between electricity generation and average temperature in the U.S. and the relationship between electricity generation and annual precipitation in the U.S. during 1949 – 2019.

Honors/ Awards/ Scholarships

Oct 2021	**Fall 2021 CNS Undergraduate Research Scholarship**, MSU College of Natural Science	*East Lansing, MI*
May 2021	**Summer Research Scholarship**, EnSURE program – MSU College of Engineering	*East Lansing, MI*
Jan 2021	**Spring 2021 CNS Undergraduate Research Scholarship**, MSU College of Natural Science	*East Lansing, MI*
Oct 2020	**Fall 2020 CNS Undergraduate Research Scholarship**, MSU College of Natural Science	*East Lansing, MI*
May 2020	**Summer 2020 CNS Undergraduate Research Scholarship**, MSU College of Natural Science	*East Lansing, MI*
Apr 2020	**L.C. Plant Mathematics Award Scholarship**, MSU Department of Mathematics	*East Lansing, MI*
Jan 2020	**Spring 2020 CNS Undergraduate Research Scholarship**, MSU College of Natural Science	*East Lansing, MI*
Mar 2018	**Academic Excellence Award (High Honor)**, Lawrence Academy	*Groton, MA*
Dec 2017	**Academic Excellence Award (Honor)**, Lawrence Academy	*Groton, MA*
May 2017	**Full-Ride Scholarship**, BIOTEC, Royal Thai Government	*Bangkok, Thailand*

University Service/ Leadership

Committee Member *East Lansing, MI*

A REPRESENTATIVE ON BEHALF OF MSU COLLEGE OF NATURAL SCIENCE FOR *Fall 2021 – Spring 2022*

- the University Academic Grievance Hearing Board
- the University Academic Integrity Hearing Board
- the University Academic Appeal Board

Extracurricular/ Volunteer Activities

Jul 2021	**MaRmot at useR! 2021 The R Conference**, Helped provide program information to participants	*Virtual*
2021–	**International Society for Computational Biology (ISCB)**, Member	*Leesburg, VA*
2021–	**Association for Women in Mathematics (AWM)**, Member	*Providence, RI*
2021–	**MSU Women in STEM**, Member	*East Lansing, MI*
2020–	**Women + Data Science**, Member	*East Lansing, MI*
2019–	**R-Ladies East Lansing**, Member	*East Lansing, MI*
2018–	**MSU Thai Student Association (ThaiSA)**, Member	*East Lansing, MI*
Jul 2018	**Burirum Pitthayakhom School**, Assisted in the educational guidance seminar for K-12 students	*Burirum, Thailand*
Mar 2018	**The Arc of Opportunity in North Central Massachusetts**, Cared for people with disabilities	*Fitchburg, MA*
2017–2018	**Math Club**, Member	*Groton, MA*
2017–2018	**Stage Crews**, Member; 6 hours/week working and learning art and technician skills for stage plays	*Groton, MA*
2017–2018	**LA Singers (High School Choir)**, Member; Soprano	*Groton, MA*
Nov 2017	**Rise Against Hungers**, Assisted in cooking foods/desserts and organized fundraising tables	*Groton, MA*