

## Siva Sankari, Ph.D.

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### EDUCATION

- Doctor of Philosophy, Biochemistry** 06/2016  
University at Buffalo, State University of New York, Buffalo, NY  
Thesis: Discovery and analysis of iron export and iron import mechanisms of *Bradyrhizobium japonicum* and their roles in managing stress responses
- Master of Technology, Biotechnology** 06/2009  
Center for Biotechnology, Anna University, Chennai, India  
Thesis: Flux balance and mutation analysis for MCL-PHA production in *Pseudomonas putida*
- Bachelor of Technology, Biotechnology** 05/2007  
Vellore Institute of Technology (VIT), Vellore, India

### RESEARCH EXPERIENCE

- Research Scientist** 06/2021 - Present  
**Post-Doctoral Associate** 05/2016 - 05/2021  
Mentor - Prof. Graham C. Walker  
Department of Biology, Massachusetts Institute of Technology, Cambridge, MA

- Discovery and biochemical characterization of host-microbe cross-talk by a heme sequestering plant peptide. (Sankari et al., **Nature Microbiology** 2022)
- Development of therapeutic applications of the peptide. (**US Provisional Patent 63/255,089**, 2021)  
Collaborators: Dr. Catherine Drennan (MIT), Dr. Sebastian Lourido (Whitehead institute), and Dr. Michael Yaffe (Koch Institute, MIT)
- Development of methodologies to elucidate mechanisms of action and identify bacterial cellular targets of host peptides. Manuscript in preparation.
- Development of tether system to study the action of peptides in various subcellular locations. This system is currently being validated in various microbes and will be used in my own lab.
- Characterization of 16S rRNA processing in alpha-proteobacteria and metal selectivity of endoribonuclease YbeY. (Babu\*, Sankari\* et al., **Nucleic Acids Research** 2020).  
Collaborator: Dr. Clayton Caswell, Virginia Tech.

- Graduate student** 05/2011-05/2016  
Mentor - Mark O' Brian, Ph.D.  
Department of Biochemistry, State University of New York, Buffalo, NY.

- Discovery and the first demonstration of iron export in bacteria. (Sankari and O'Brian, **JBC** 2014)
- Identification of the first iron import pathway into bacteria during symbiotic nitrogen fixation and characterization of the indispensable iron import pathway in *Bradyrhizobium japonicum*. (Sankari and O'Brian, **JBC** 2016)
- Discovery and characterization of the interplay between iron storage and iron export in bacteria. (Sankari and O'Brian, **PLoS One** 2016)

- Research associate (Masters Student)** 06/2007-06/2009  
Guidance: S. Ramalingam Ph.D.  
Department of Biotechnology, Anna University, Chennai, Tamil Nadu, India

- Genome-scale flux balance analysis to maximize production of PHA by *Pseudomonas putida*. (**Indian Journal of Biotechnology**).
- Flux balance analysis to improve reuterin production by *Lactobacillus reuteri*.

## PUBLICATIONS

- **Siva Sankari**, Vignesh M.P. Babu, Ke Bian, Areej Alhazmi, Mary C. Andorfer, Dante M. Avalos, Tyler A. Smith, Kwan Yoon, Catherine L. Drennan, Michael B. Yaffe, Sebastian Lourido & Graham C. Walker, *A haem-sequestering plant peptide promotes iron uptake in symbiotic bacteria*, **Nature Microbiology**, <https://doi.org/10.1038/s41564-022-01192-y>, 2022.  
MIT News coverage - <https://news.mit.edu/2022/heme-plant-molecule-iron-0811>  
Coverage by other News outlets - <https://nature.altmetric.com/details/133960280/news>  
Nature portfolio article: <https://microbiologycommunity.nature.com/posts/plant-tricks-symbiotic-bacteria-for-their-own-good>
- VMP Babu, **Siva Sankari**, A Ghosal, Graham C. Walker, *A Mutant Era GTPase Suppresses Phenotypes Caused by Loss of Highly Conserved YbeY Protein in Escherichia coli*, **Frontiers in Microbiology**, doi: 10.3389/fmicb.2022.896075, PMC9159920, 2022.
- VMP Babu\*, **Siva Sankari\***, JA. Budnick, CC. Caswell and Graham C. Walker, *Sinorhizobium meliloti YbeY is a zinc-dependent single-strand specific endoribonuclease that plays an important role in 16S ribosomal RNA processing*, **Nucleic Acids Research**, 48 (1), 332-348, PMC6943124, 2020 (\*Co-first authors).
- **Siva Sankari** and M.R. O'Brian, *The Bradyrhizobium japonicum Ferrous Iron Transporter FeoAB Is Required for Ferric Iron Utilization in Free Living Aerobic Cells and for Symbiosis.*, **Journal of Biological Chemistry**, 291(30): p. 15653-62, PMC4957049, 2016.
- **Siva Sankari** and M.R. O'Brian, *Synthetic Lethality of the bfr and mbfA Genes Reveals a Functional Relationship between Iron Storage and Iron Export in Managing Stress Responses in Bradyrhizobium japonicum*, **PLoS One**, 11(6): p. e0157250, PMC4902296, 2016.
- **Siva Sankari** and M.R. O'Brian, *A bacterial iron exporter for maintenance of iron homeostasis*, **Journal of Biological Chemistry**, 289(23): p. 16498-507, PMC4047416, 2014.
- S. Ramalingam, M. Vikram, M.P. Vigneshbabu and **M. SivaSankari**, *Flux balance analysis for maximizing polyhydroxy alkanoate production in Pseudomonas putida*, **Indian Journal of Biotechnology**, 10: p. 70-74, 2011.

## PATENT

- Heme Binding Small Peptide- **US Patent Pending - Serial Number: 63/255,089** (Oct 2021).  
Inventors: **Siva Sankari**, Vignesh M.P. Babu, and Graham C. Walker.

## SEMINARS AND CONFERENCE PRESENTATIONS

- **Invited Speaker** - College of Science Seminar series, Clemson University, South Carolina, 2022.
- **Speaker** - International Society for Molecular Plant-Microbe Interactions- Early Career Showcase, 2022
- **Speaker** - **American Chemical Society** Fall 2022 Meeting, Chicago, IL.
- **Speaker** - **Gordon Research Conference** - Chemistry and Biology of Tetrapyrroles, Session: Tetrapyrroles in human health and disease, Rhode Island, 2022.
- **Invited Speaker** - **25<sup>th</sup> North American Conference on Symbiotic Nitrogen Fixation**, University of Wisconsin, Madison, 2022
- **Speaker** - **Gordon Research Conference** - Cell Biology of Metals, Session: Sensing and regulating metal metabolism, Vermont, 2021.
- **Two short talks at Biology retreat** of Department of Biology, MIT, 2021 and 2018.
- **Speaker** - **New England Workshop on Symbiosis** at University of Vermont, 2019.
- **Speaker** - Work in Progress Seminar, Post-doctoral Association, MIT, 2022 and 2018.
- **Speaker** - **23<sup>rd</sup> North American Conference on Symbiotic Nitrogen Fixation**, Mexico, 2015.
- Poster at **Biometals 2014**, International Conference on Biometals, Duke University, NC, 2014.
- **Three short talks - Biochemistry Research Day**, SUNY Buffalo, NY, 2012, 2013, and 2014.
- **Speaker** - **Department of Genetics, Genomics and Bioinformatics**, SUNY Buffalo, NY, 2015.
- **Speaker** - Biochemistry Graduate student Association meetings annually (2012-2015)
- Posters at Graduate Student Orientation sessions for incoming students (2012-2015).
- **Speaker** - **"International Conference on Challenges in Biotechnology and Food Technology"** at Annamalai University, Tamil Nadu, India, 2009.

## AWARDS

- **Best Oral Presentation - Silver** at Department of GGB Research Day, 2015.
- **Elizabeth Olmsted Ross award** - Best oral presentation at Dept. of Biochem Research Day, 2014.
- **Virginia Barnes Travel Award - twice** 2014 and 2015.
- **Best Oral Presentation** - Pratiyog '09, National Level Technical Symposium, India 2009.
- **GATE Merit Scholarship Award** - Ministry of Human Resource Development, India (2007-2009).
- **Best oral presentation** - "National Science Congress", India, 1999.
- **Merit Scholarship award** – Top students in Undergraduate Studies, India (2004 and 2005).

## TEACHING EXPERIENCE

- **Curriculum developer and Co-Instructor for Course 6. A01**, Massachusetts Institute of Technology - A combined classroom and laboratory course for undergraduates. Classroom session- Understanding the mechanism of action of antibiotics and antibiotic resistance. Laboratory session- Isolation of antibiotics producing soil bacteria and evaluation against ESKAPE pathogens. Part of **Tiny Earth Initiative** (<https://tinyearth.wisc.edu/>), 2019.
- **Kaufman Teaching Certificate Program** and Microteaching training at MIT, 2019.
- **Teaching assistant**- BCH403/503 –Course on Biochemical principles for Undergraduate and Master students in Department of Biochemistry, University at Buffalo (Fall 2012)
- **Lecturer** - Sri Venkateshwara College of Engineering, Sriperumbudur, India (2009–2010).  
**Course instructor** Classroom courses -Protein Engineering and Advanced Genetic Engineering.  
**Course instructor** Laboratory courses- Recombinant DNA technology and Molecular biology.
- Testimonials from my students can be found at: <https://www.linkedin.com/in/siva-sankari-7a714182/details/recommendations/?detailScreenTabIndex=0>

## MENTORING PROGRAM DEVELOPMENT AND EXPERIENCE

- **Undergraduate Mentoring program ReAct founder and Co-ordinator.** 6-month scientific training program for undergraduate students from underprivileged institutions in India. Undergrads are matched with trained mentors for a virtual program where the mentees get training and exposure to build capabilities for embarking on a career in scientific research, June 2021-Present. <https://sciroi.net/india/virtual-mentorship-for-undergrads/>
- **Curriculum developer in Kalpana Program** (part of Vigyanshaala She-For-STEM program-**Short listed for Nature Research Awards for Inspiring Women in Science**). An 8-week mentorship program for undergraduate women in India to kindle the spirit of innovation and scientific temperament, May 2021-Present. <https://mytribe.vigyanshaala.com/>
- **Mentoring** at Dr. Graham Walker lab, MIT
  - Jakub Etrich (MSRP Bio)-Undergraduate from Barry University, 2022.
  - Dr. Areej Alhazhmi- Visiting scholar IBK fellowship, MIT.
  - Heer Joisher (Khorana Scholar; MSRP Bio), Undergraduate from BITS, India, 2018-2019.
  - Titash Biswas-Undergraduate Student-Biology Major-MIT-2021-2022.
- **Mentoring** at Dr. Mark O'Brian lab, University at Buffalo
  - ✓ Alka Marala (Undergraduate student)- Medical student.
  - ✓ Fengyue Zhang (Masters student)- Graduate student at University at Buffalo
  - ✓ Dr. Brittany Steimle (Graduate Rotation)
  - ✓ Dr. Rachel Simpson (Graduate Rotation)
  - ✓ Dr. Xiaomeng Shen (Graduate Rotation)

## DIVERSITY, EQUITY AND INCLUSION: ACTIVITIES AND TRAINING

- Member of the **focus group on Lab level DEI trainings**, Department of Biology, MIT, Feb 2022.
- **LinkedIn learning course with certificates** for a) Diversity, Inclusion and Belonging, b) Skills for inclusive conversations, c) Unconscious bias, d) Confronting Bias thriving across differences, e) Inclusive leadership, f) Developing a Diversity, Inclusion and Belonging program, 2019.
- Diversity training for volunteering in **Fellow selection committee in Intersections Science Fellows Symposium**, Jan 2021.

## **OUTREACH ACTIVITIES**

- Invited talk titled “**Career pathways for girls in science and research**” - organized by Subbiah Central school, Tirupur, India, to girls all over India for inspiring them to pursue science, 2020.
- Invited talk at Vellore Institute of Technology, Vellore, India on “**Carving a career in Biosciences research**” to Undergraduate Biotechnology students, 2020.
- Invited talk at iDream Career –A career counseling organization based in New Delhi, India on “**Careers in Biosciences**”, 2020.
- Volunteered for **MIT Annual High School Field trip event** as part of MIT-BIO outreach activity, 2019.
- Volunteered at the **Annual Genome Day** event organized by University at Buffalo, where students from Buffalo Public schools learn about DNA and extract their own DNA, 2014.

## **EDITORIAL AND REVIEWING ACTIVITIES**

- **Assistant Features Editor** at Molecular Plant-Microbe Interactions journal (**MPMI**) – An American Plant Society Journal.
- **Guest editor** – Journal of Visualized Experiments (**JoVE**)

### **Reviewer**

- mSystems (ASM)
- BMC Genomics
- Molecular Plant-Microbe Interactions Journal (MPMI) - APS journal
- Data in Brief - Elsevier
- Molecular Epidemiology and Evolutionary Genetics of Infectious Diseases (MEEGID) – Elsevier
- Plant Direct - Wiley Online Publishing

## **WORKSHOPS ORGANIZED**

- Organizer - “**New England Workshop on Symbiosis 2018**” - conference on symbiosis, MIT, 2018.
- Member of **Organizing team of Independent Activities Period 2019 at MIT Biology**, 2019.
- Organizer - **National Level workshop** on “Real-time PCR” funded by the Department of Biotechnology, India, 2010.
- Organizer - **National Level workshop** on “Recent trends in Industrial Bioprocesses” and provided hands-on training in Animal Cell Culture, SVCE, India, 2009.

## **PROFESSIONAL MEMBERSHIPS**

- Member of the **AWIS Massachusetts chapter** (Mass AWIS) since 2016. Member of Mentoring circles program of **Association for Women in Science (AWIS)** in 2017 and 2019.
- Member of **American Chemical Society** (Division of Biological Chemistry) since 2021.
- Member of **International Society for Molecular Plant-Microbe Interaction** Since 2020.

## **NATIONAL LEVEL SYMPOSIUMS AND WORKSHOPS ATTENDED**

- New England Workshop on Symbiosis 2016, University of Vermont, Oct 2016.
- 14<sup>th</sup> Annual Plant Biology Symposium on “Phytobiomes: The social networks of plants and microbes”, University of Amherst, Oct 2016.
- National level training and workshop on “Modern research methodologies and Biotechnological tools in biodiversity conservation”, 2009 - Best Participant Award.
- International Symposium on “Recent trends in protein engineering” in VIT, India, Feb 2007.
- Training in “Plant Tissue Culture”, Bionymph Research Lab Pvt. Ltd., Bangalore, India, 2005.
- Summer training in “Protein expression and purification for Vaccine development” at Shantha Biotech Limited, Hyderabad, India, 2004.

## REFERENCES

- 1) Dr. Graham C. Walker (Post-doc advisor)**  
American Cancer Society Professor, HHMI Professor, Professor of Biology,  
Massachusetts Institute of Technology  
Room: 68-633, 31 Ames St,  
Cambridge, MA-02139.  
Ph: 617-253-6716 Email: [walker@mit.edu](mailto:walker@mit.edu)
  
- 2) Dr. Mark O' Brian (Ph.D. Advisor)**  
Professor and Chair, Department of Biochemistry,  
Jacobs School of Medicine and Biomedical Sciences, University at Buffalo  
955 Main Street, Room 4102  
Buffalo, New York -14203.  
Ph: 716-829-3200 Email: [mrobrian@buffalo.edu](mailto:mrobrian@buffalo.edu)
  
- 3) Dr. Sebastian Lourido**  
Assistant Professor of Biology, Massachusetts Institute of Technology,  
Member-Whitehead Institute for Biomedical Research,  
Room 561D, 455 Main St,  
Cambridge, MA 02142  
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- 4) Dr. James J. Collins**  
Termeer Professor of Medical Engineering & Science  
Professor, Department of Biological Engineering, Massachusetts Institute of Technology;  
Wyss Institute, Harvard University;  
Broad Institute of MIT and Harvard;  
E25-337, 45 Carleton Street  
Cambridge, MA 02139  
Ph: 617-324-6607 Email: [jimjc@mit.edu](mailto:jimjc@mit.edu)
  
- 5) Dr. Mark D. Sutton**  
Professor, Department of Biochemistry,  
Jacobs School of Medicine and Biomedical Sciences,  
University at Buffalo  
955 Main Street, Room 4217  
Buffalo, New York -14203.  
Ph: 716-829-3581 Email: [mdsutton@buffalo.edu](mailto:mdsutton@buffalo.edu)
  
- 6) Dr. Lourdes Aleman** (Please contact Dr. Aleman, if a recommendation for teaching is needed)  
Associate Director for Teaching and Learning  
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