ANTHONY G. VECCHIARELLI

Assistant Professor of Molecular, Cellular, and Developmental Biology
University of Michigan
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EDUCATION AND POSTDOCTORAL TRAINING

2010-2016 **Postdoctoral Fellow**, Laboratory of Molecular Biology, National Institutes of Health
Advisor: Dr. Kiyoshi Mizuuchi
Project: Cell-free reconstitution of DNA segregation and cell-division positioning systems

2003-2010 **Ph.D.** in Molecular Genetics, Department of Molecular Genetics, University of Toronto
Advisor: Dr. Barbara Funnell
Thesis Project: Analysis of the Nucleoprotein Complexes Essential for Plasmid Partition

2003 **Honors B.Sc.**, *with High Distinction*, in Molecular Genetics and Microbiology
Department of Molecular Genetics, University of Toronto, Ontario, Canada

CURRENT POSITION

Associate Professor
Department of Molecular, Cellular & Developmental Biology
College of Literature, Science and the Arts
University of Michigan, Ann Arbor
Since September 2024

Assistant Professor (January 2017 – August 2024)

ACADEMIC AFFILIATIONS AT THE UNIVERSITY OF MICHIGAN

Since 2021 Department of Biological Chemistry – Affiliate Faculty Member
Since 2020 Program in Chemical Biology – Faculty Member
Since 2019 Global CO_2 Initiative – Faculty Member
Since 2018 Program in Biophysics – Dry appointment Faculty Member
Since 2017 Department of Microbiology and Immunology – Dry appointment Faculty Member
Since 2017 Cellular Biotechnology Training Program – Faculty Member
Since 2017 Program in Biomedical Sciences – Faculty Member
2017-2022 Genetics Training Grant - Faculty Member

HONOURS AND AWARDS

2024 Class of 1923 Memorial Teaching Award, University of Michigan
2019-2024 CAREER Award, National Science Foundation
2018-2019 Undergraduate Teaching Excellence Award, Program in Biology, University of Michigan
2015-2016 Stadtman Investigator semi-finalist, NIH
2014 Cozzarelli Prize, National Academy of Sciences
2013-2014 Fellows Award for Research Excellence, NIH
2011-2015 Nancy Nossal Postdoctoral Fellowship, NIH
2010 Barbara Vivash Award - Best PhD Thesis, University of Toronto

EXTERNAL FUNDING

Project Title: "Coordinated Spatial Organization in Bacteria"
(Award R35 GM152128)
Amount: **$1,909,675**
Granting Agency: NIH/NIGMS – R32 (MIRA)
Funding Period: 12/01/2023 - 11/30/2028
Role: **PI**
Status: **Active**

Project Title: "CAREER: ATP-driven Spatial Regulation of a Biomolecular Condensate in Bacteria"
(Award #1941966)
Amount: **$1,300,000**
Granting Agency: NSF/BIO – MCB Cluster
Funding Period: 12/15/2019 – 11/30/2024
Role: **PI**
Status: **Active**

Project Title: "Regulation of Organelle Homeostasis in Bacteria"
(Application #GNJ7BBP73WE9)
Amount: **$1,549,871**
Granting Agency: NSF/BIO – MCB Cluster
Funding Period: 05/01/2025 – 04/31/2029
Role: **PI**
Status: **Pending**

Project Title: "Nucleoid structure and function in plastids"
(Award #1934703)
Amount: **$6,344** (Vecchiarelli Direct portion)
Granting Agency: NSF/BIO – MCB Cluster
Funding Period: 8/1/2019 – 12/31/2023
Role: **Co-PI** (Lead PI - Andrzej Wierzbicki)
Status: **Completed**

Project Title: "Organelle trafficking, inheritance, and homeostasis in bacteria"
(Award #1817478)
Amount: **$899,954**
Granting Agency: NSF/BIO – MCB Cluster
Funding Period: 7/1/2018 – 6/30/2023
Role: **PI**
Status: **Completed**

INTERNAL FUNDNG

Project Title: "Mining the gut microbiome for novel protein organelles involved in host-microbe interactions."
Amount: **$60,000** (Vecchiarelli Direct portion - $20,000)
Granting Agency: mCubed Classic Grant
Funding Period: 2019-2022
Role: **Co-PI** (Team: Anthony Vecchiarelli, Tobias Giessen, Thomas Schmidt)
Status: **Completed**

Project Title: "Facilitating the Publication of a Review Paper written by the MCDB 401 Class."
Amount: **$500**
Granting Agency: Center for Research on Learning and Teaching (CRLT) Instructional Development Grant
Funding Period: 2018-2019
Role: **PI**
Status: **Completed**

EXTERNAL FUNDING TO VECCHIARELLI LAB MEMBERS

2022-2024 NIH T32 Training Grant – CBTP Fellowship: Jordan Byrne (**$20,000/year**)
2019-2022 NSF Graduate Research Fellowship: Lisa Tran (**$46,000/year**)
2018 American Society for Microbiology, Capstone Fellowship: Pusparanee Hakim (**$2,000**)

INTERNAL FUNDING TO VECCHIARELLI LAB MEMBERS

2019 CEW+ Scholar: Pusparanee Hakim (**$5,500**)
2018-2021 Michigan Life Sciences Postdoctoral Fellowship: Joshua S. MacCready (**$25,000/year**)

PUBLICATIONS

[#] Vecchiarelli Lab member
* Equal contribution
[%] co-corresponding author

Research Manuscripts (*Since starting at UM in Jan 2017*)

1. Basalla JL[#], Ghalmi M[#], Hoang Y[#], Dow R[#], **Vecchiarelli AG** (2024). An invariant C-terminal tryptophan in McdB mediates its interaction and positioning function with carboxysomes. *BioRxiv*. doi: https://doi.org/10.1101/2023.11.21.568049 (*Accepted at Molecular Biology of the Cell*)

2. Hoang Y*[#], Azaldegui CA*[#], Dow RE[#], Ghalmi M[#], Biteen JS, **Vecchiarelli AG** (2024). An experimental framework to assess biomolecular condensates in bacteria. *Nature Communications*. 15(1):3222 doi: 10.1038/s41467-024-47330-4

3. Basalla JL[#], Mak CA[#], Byrne J[#], Ghalmi M[#], Hoang Y[#], **Vecchiarelli AG** (2023). Dissecting the phase separation and oligomerization activities of the carboxysome positioning protein McdB. *eLife*. 12:e81362. doi: 10.7554/eLife.81362.
    - *eLife Digest - Getting Organized*

4. Pulianmackal LT[#], Limcaoco JM[#], Ravi K[#], Yang S[#], Zhang J[#], Tran MK[#], Ghalmi M[#], O'Meara MJ, **Vecchiarelli AG** (2023). Multiple ParA/MinD ATPases coordinate the positioning of disparate cargos in a bacterial cell. *Nature Communications*. 14(1):3255. doi: 10.1038/s41467-023-39019-x.
    - *Press Release - How bacteria surf cargo through the cell*

5. Swasthi HM, Basalla JL[#], Dudley CE[#], **Vecchiarelli AG**, Chapman MR (2023). Cell Surface-localized CsgF Condensate is a Gatekeeper in Bacterial Curli Subunit Secretion. *Nature Communications*. 14(1):2392. doi: 10.1038/s41467-023-38089-1.

    For this collaboration, my students (Basalla JL and Dudley CE) and I participated in the experimental design, data acquisition, and data analysis for the *in vitro* phase separation experiments.

6. Beaufay F*, Amemiya HM*, Guan J, Basalla JL[#], Meinen BA, Chen Z, Mitra R, Bardwell JCA, Biteen JS, **Vecchiarelli AG**, Freddolino PL[%], Jakob U (2021)[%]. Polyphosphate drives bacterial heterochromatin formation. *Science Advances*. 7(52):eabk0233. doi: 10.1126/sciadv.abk0233.
    - *Press Release - Bacterial genome is regulated by an ancient molecule*
    - *Scientific American - Ancient molecule helps bacteria untangle genetic activity*

    For this collaboration, my student (Basalla JL) and I participated in the experimental design, data acquisition, and data analysis for Figure 5A to D and Movies S1 to S7.

7. Landino J, Leda M, Michaud A, Swider ZT, Prom M, Field CM, Bement WM, **Vecchiarelli AG**, Goryachev AB, Miller AL (2021). Rho and F-actin self-organize within an artificial cell cortex. *Current Biology*. 31(24):5613. doi: 10.1016/j.cub.2021.10.021.
    - *Press Release - U-M researchers create artificial cell cortex*

    For this collaboration, I participated in experimental design and trained the first author (Landino J) in developing the cell-free reconstitution approach used in all figures.

8. Hakim P[#], Hoang Y[#], **Vecchiarelli AG** (2021). Dissection of the ATPase active site of McdA reveals the sequential steps essential for carboxysome distribution. *Molecular Biology of the Cell*. 32(20):ar11. doi: 10.1091/mbc.E21-03-0151.

9. Rillema R*[#], Y Hoang*[#], MacCready JS[#], **Vecchiarelli AG** (2021). Carboxysome Mispositioning Alters Growth, Morphology, and Rubisco Level of the Cyanobacterium Synechococcus elongatus PCC 7942. *mBio*. 12(4):e0269620. doi: 10.1128/mBio.02696-20.

10. MacCready JS*[#], Tran L*[#], Basalla JL[#], Hakim P[#], **Vecchiarelli AG** (2021). The McdAB system positions α-carboxysomes in proteobacteria. *Molecular Microbiology*. 116(1):277-297. doi: 10.1111/mmi.14708.
    - *2022 Top-cited article in the journal*

11. Raghunathan S, Chimthanawala A, Krishna S, **Vecchiarelli AG**, Badrinarayanan A (2020). Asymmetric chromosome segregation and cell division in DNA damage-induced bacterial filaments. *Molecular Biology of the Cell*. 31:2920. doi: 10.1091/mbc.E20-08-0547

    For this collaboration, I participated in method design and made plasmid constructs.

12. MacCready JS[#], Basalla JL[#], **Vecchiarelli AG** (2020). Origin and evolution of carboxysome positioning systems in cyanobacteria. *Molecular Biology and Evolution*, 37:1434. doi: 10.1093/molbev/msz308

13. MacCready JS[#], Hakim P[#], Young EJ, Hu L, Liu J, Osteryoung KW, **Vecchiarelli AG**[%], Ducat DC[%] (2018). Protein Gradients on the Nucleoid Position the Carbon-fixing Organelles of Cyanobacteria. *eLife* 7:e39723. doi: 10.7554/eLife.39723
    - *eLife Interview - First Paper as PI – Anthony Vecchiarelli*
    - *eLife Insight - Carboxysomes: How bacteria arrange their organelles*
    - *eLife Digest - A place for everything.*
    - *Press Release - How bacteria organize their factories and what it means for a bioeconomy*
    - *F1000 Recommendation*

    This paper was a collaboration with the Ducat lab at MSU. The 1st author, Joshua MacCready, was a PhD student in the Ducat lab, who then joined my lab as a postdoc in 2017. The 2nd author was a PhD student from my lab who performed all biochemical and protein interaction experiments. MacCready, Ducat, and Vecchiarelli wrote the paper. Final author position was chosen on a coin toss. Estimated breakdown of contributions, based on data in figures: Vecchiarelli lab, 45%; Ducat lab, 45%; Liu lab 10%.

14. Sundararajan K, **Vecchiarelli AG**, Mizuuchi K, Goley ED (2018). Species- and C-terminal linker-dependent variations in the dynamic behavior of FtsZ on membranes in vitro. *Molecular Microbiology* 110, 47. doi: 10.1111/mmi.14081

    For this collaboration, I participated in experimental design and trained the first author (Sundararajan K) in developing the cell-free reconstitution approach used in all figures.

15. Hu L, **Vecchiarelli AG**, Mizuuchi K, Neuman KC, Liu J (2017). Brownian ratchet mechanism for faithful segregation of low-copy-number plasmids. *Biophysical Journal* 112, 1489. doi: 10.1016/j.bpj.2017.02.039

Reviews and Commentaries (*Since starting at UM in Jan 2017*)

1. Pulianmackal LT[#] & **Vecchiarelli AG** (2024). Positioning of cellular components by the ParA/MinD family of ATPases. *Current Opinion in Microbiology.* 79:102485. doi: 10.1016/j.mib.2024.102485

2. MacCready JS[#] & **Vecchiarelli AG** (2021). Positioning the Model Bacterial Organelle, the Carboxysome. *mBio* 12(3):e02519. doi: 10.1128/mBio.02519-19

3. Groaz A, Moghimianavval H, Tavella F, Giessen TW, **Vecchiarelli AG**, Yang Q, Liu AP (2020). Engineering spatiotemporal organization and dynamics in synthetic cells. *Wiley Interdiscip Rev Nanomed Nanobiotechnol.* 21:e1685. doi: 10.1002/wnan.1685.

4. Azaldegui CA, **Vecchiarelli AG**[%], Biteen JS[%] (2020). The emergence of phase separation as an organizing principle in bacteria. *Biophysical Journal*. 28:S0006. doi: 10.1016/j.bpj.2020.09.023.
    - *Press Release - Understanding the 'membrane' in membraneless organelles*
    - *2022 Top-cited article in the journal*

5. Tarnopol RL, Bowden S, Hinkle K, Balakrishnan K, Nishii A, Kaczmarek CJ, Pawloski T, **Vecchiarelli AG** (2019). Lessons from a Minimal Genome: What are the Essential Organizing Principles of a Cell Built from Scratch? *ChemBioChem* 20, 2535. doi: 10.1002/cbic.201900249
    - *All authors are undergraduates from my course "Building a Synthetic Cell"*

6. MacCready JS[#] & **Vecchiarelli AG** (2018). In long bacterial cells, the Min system can act off-center. *Molecular Microbiology* 109:268. doi: 10.1111/mmi.13995

7. Mizuuchi K & **Vecchiarelli AG** (2017). Mechanistic insight of the Min oscillator via cell-free reconstitution and imaging. *Physical Biology*. 15, 031001. doi: 10.1088/1478-3975/aa9e5e

8. Hu L, **Vecchiarelli AG**, Mizuuchi K, Neuman KC, Liu J (2017). Brownian Ratchet Mechanisms of ParA-mediated partitioning. *Plasmid* 92, 12. doi: 10.1016/j.plasmid.2017.05.002

Pre-faculty Position - Research Manuscripts *(Prior to Jan. 2017)*

1. **Vecchiarelli AG**, Li M, Mizuuchi M, Hwang LC, Seol Y, Neuman KC, Mizuuchi K (2016). Membrane-bound MinDE complex acts as a toggle switch that drives Min oscillation coupled to cytoplasmic depletion of MinD. *PNAS* 113, E1479. doi: 10.1073/pnas.1600644113
    - *PNAS Highlight – Sherratt DJ. Oscillation helps get division right*

2. Longhua Hu, **Vecchiarelli AG**, Mizuuchi K, Neuman KC, Liu J (2015). Directed and persistent movement arises from mechanochemistry of the ParA/ParB system. *PNAS* 112, E7055. doi: 10.1073/pnas.1505147112

3. **Vecchiarelli AG**, Seol Y, Neuman KC, Mizuuchi K (2015). A moving ParA gradient on the nucleoid directs subcellular cargo transport via a chemophoresis force. *BioArchitecture* 4, 154. doi: 10.4161/19490992.2014.987581

4. **Vecchiarelli AG**, Li M, Mizuuchi M, Mizuuchi K (2014). Differential affinities of MinD and MinE to anionic phospholipid influence Min patterning dynamics in vitro. *Molecular Microbiology* 93, 453. doi: 10.1111/mmi.12669

5. **Vecchiarelli AG**, Neuman KC, Mizuuchi K (2014). A propagating ATPase gradient drives transport of surface-confined cellular cargo. *PNAS* 111, 4880. doi: 10.1073/pnas.1401025111
    - ***Cozzarelli Prize at PNAS***
    - *PNAS Science Sessions Podcast*
    - *PNAS Highlight - Kiekebusch & Thanbichler. Plasmid segregation by a moving ATPase gradient.*

6. **Vecchiarelli AG**, Havey JC, Ing L, Wong E, Waples W, Funnell BE (2013). Dissection of the ATPase active site of P1 ParA reveals multiple active forms essential for plasmid partition. *Journal Biological Chemistry* 288, 17823. doi: 10.1074/jbc.M113.469981

7. **Vecchiarelli AG**, Hwang LC, Mizuuchi K (2013). Cell-free study of F plasmid partition provides evidence for cargo transport by a diffusion-ratchet mechanism. *PNAS* 110, E1390. doi: 10.1073/pnas.1302745110

8. Hwang LC*****, **Vecchiarelli AG***, Han YW, Mizuuchi M, Harada Y, Funnell BE, Mizuuchi K (2013). ParA-mediated plasmid partition driven by protein pattern self-organization. *EMBO Journal* 32, 1238. doi: 10.1038/emboj.2013.34
    - *EMBO Highlight - Sherratt DJ. Plasmid partition: sisters drifting apart.*

9. **Vecchiarelli AG** & Funnell BE (2013). Probing the N-terminus of ParB using cysteine-scanning mutagenesis and thiol modification. *Plasmid* 70, 86. doi: 10.1016/j.plasmid.2013.02.002

10. Havey JC, **Vecchiarelli AG**, Funnel BE (2012). ATP-regulated interactions between P1 ParA, ParB & non-specific DNA that are stabilized by the plasmid partition site. *Nucleic Acids Research* 40, 801. doi: 10.1093/nar/gkr747

11. **Vecchiarelli AG**, Han YW, Tan X, Mizuuchi M, Ghirlando R, Biertümpfel C, Funnell BE, Mizuuchi K (2010). ATP control of dynamic P1 ParA-DNA interactions: a key role for the nucleoid in plasmid partition. *Molecular Microbiology* 78, 78. doi: 10.1111/j.1365-2958.2010.07314.x
    - *Highlight* - Howard & Gerdes. What is the mechanism of ParA-mediated DNA movement?
    - *2010 highlight from the ASM blog "Small Things Considered"*

12. **Vecchiarelli AG**, Schumacher MA, Funnell BE (2007). P1 partition complex assembly involves several modes of protein-DNA recognition. *Journal Biological Chemistry* 282, 10944. doi: 10.1074/jbc.M611250200

Pre-faculty Position – Reviews and Book Chapters (Prior to Jan. 2017)

1. **Vecchiarelli AG**[%], Taylor JA, Mizuuchi K[%] (2015). Reconstituting ParA/ParB-mediated transport of DNA cargo. Building a Cell from its Component Parts. *Methods in Cell Biology* 128, Chapter 13. doi: 10.1016/bs.mcb.2015.01.021

2. **Vecchiarelli AG**, Mizuuchi K, Funnell BE (2012). Surfing biological surfaces: exploiting the nucleoid for partition and transport in bacteria. *Molecular Microbiology* 86, 513. doi: 10.1111/mmi.12017
    - *Rated a "Must Read" by the Faculty of 1000*

EXTERNAL RESEARCH TALKS AND SEMINARS *(Invited Speaker)*

2024

June	Dept of Biochemistry Seminar Series, University of São Paulo *Host: Frederico Gueiros-Filho, Principle Investigator*	São Paulo, Brazil
May	Dept of Biochemistry and Biomedical Sciences, McMaster *Host: John Whitney, Associate Professor*	Hamilton, ON, Canada
Mar	Dept of Biochemistry Seminar Series, University of Wisconsin *Host: Scott Coyle, Assistant Professor*	Madison, WI

2023

June	Bacterial Cell Biology & Development GRC	Manchester, NH
June	American Society for Microbiology Annual Meeting *Session Chair & Speaker*	Houston, TX
April	Molecular Plant Sciences, Michigan State University *Host: Daniel Ducat, Associate Professor*	East Lansing, MI
Mar	Microbiology and Molecular Genetics, Texas Medical Center *Host: William Margolin, Professor*	Houston, TX
Mar	American Society for Biochemistry and Molecular Biology *Invited by Cheryl Kerfeld, Professor*	Seattle, WA

2022

Aug	Plant and Microbial Cytoskeleton GRC *Session Chair*	Andover, NH
Aug	Molecular Genetics of Bacteria & Phages Meeting	Madison, WI
July	Lorentz Workshop on Reconstituting Biology	Leiden, Netherlands
July	Symposium on Carbon Utilization by Photosynthetic Organisms *Session Chair & Speaker*	Princeton
June	Laboratory of Molecular Biology Seminar Series, NIH	Bethesda, MD
May	Cell Biology & Molecular Genetics Seminar Series *Host: Wade Winkler, Professor*	University of Maryland
April	Cell Biology Seminar Series *Host: Julie Brill, Professor*	University of Toronto
April	Bacteriology Distinguished Lecture Series *Host: Brianna Burton, Assoc. Professor*	Madison, WI
April	Bacterial Cell Biology Seminar Series – UC Louvain *Host: Geraldine Laloux, Asst. Professor*	Brussels, Belgium
April	Biochemistry Seminar Series *Host: Alex Vecchio, Asst. Professor*	University of Nebraska
April	Anatomy & Cell Biology Seminar Series – Western University *Host: Patrick Lajoie, Assoc. Professor*	London, ON, Canada
Mar	Mol. Bio. & Biochem Seminar Series – Simon Fraser University *Host: Nancy Forde, Professor*	Burnaby, BC, Canada

2021

Dec	Cell Bio Virtual – ASCB/EMBO Meeting	
Oct	Institute of Molecular Biology Seminar Series *Host: Scott Hansen, Asst. Professor*	University of Oregon
June	American Society for Microbiology World Microbe Forum *Session Chair & Speaker*	
Mar	Department of Biology Seminar Series *Host: Alexander Bisson, Asst. Professor*	Brandeis University

2020

Nov	CauloConference 2.0	

2019

Dec	American Society for Cell Biology Annual Meeting	Washington, DC
Oct	Biology Seminar Series	University of Toronto
	Host: Timothy Westwood, Professor	
Sept	Biological Sciences Seminar Series	Wayne State University
	Host: Jared Schrader, Asst. Professor	
July	Laboratory of Molecular Biology Seminar Series, NIH	Bethesda, MD
May	Conference on Protein Folding, Assemblies & Molecular Motions	Notre Dame, IN
April	Cell Biology of Prokaryotes Conference	Bad Staffelstein, Germany
April	Microbiology Seminar Series, Max Planck Institute	Marburg, Germany
	Host: Martin Thanbichler, Professor	

2018

June	American Society for Microbiology Annual Meeting	Atlanta, GA
	Moderator & Speaker – Trafficking, Inheritance, & Homeostasis of Bacterial Organelles	
	Moderator & Speaker – Organelles and the Cytoskeleton in Bacteria	
Mar	Molecular Biology Seminar Series, University of Wyoming	Laramie, WY

2017

Sept	Biochemistry Department Seminar Series, Duke University	Durham, NC
Sept	Lambda Lunch, NIH	Bethesda, MD
	Host: Kumaran Ramamurthi, Professor	
June	American Society for Microbiology Annual Meeting	New Orleans, LA

Pre-faculty position

2016

Dec	American Society for Cell Biology Annual Meeting	San Francisco, CA
Aug	Molecular Genetics of Bacteria and Phages Meeting	Madison, WI
Feb	Department of Biology, Indiana University Bloomington	Bloomington, IN
	Host: Daniel Kearns, Professor	

2015

Dec	Molecular, Cellular & Developmental Biology,	University of Michigan
Dec	Earl Stadtman Symposium, NIH	Bethesda, MD
Dec	American Society for Cell Biology Annual Meeting	San Diego, CA
June	Nucleic Acids Gordon Research Conference	Biddeford, ME
June	Prokaryotic Cell Biology, American Society for Microbiology	Washington, DC
Mar	Department of Biology, Queens University	Kingston, ON, Canada

2014

Dec	Earl Stadtman Symposium, NIH	Bethesda, MD
Dec	Microbiology Department, UC Davis	Davis, CA
	Host: Stephen Kowalczykowski, Distinguished Professor	
April	Biochemistry Seminar, Microbiology & Immunology	University of Ottawa
Mar	American Physical Society Annual Meeting	Denver, CO

2013

June	American Society for Microbiology Annual Meeting	Denver, CO
May	Chromosome Dynamics Gordon Research Conference	Barga, Italy
Mar	The Bauer Forum, Harvard University	Boston, MA
	Host: Joseph Calarco, Asst. Professor	

UNIVERSITY OF MICHIGAN INTERNAL PRESENTATIONS *(Invited Speaker)*

2024
Mar Michigan Molecular Modeling Seminar Series. Speaker.
2022
Mar The Farrand Lecture. Natural Sciences Museum
Mar Biological Chemistry Seminar Series. Speaker
2021
Sept Responsible Conduct of Research (PIBS 503). Discussion Leader
2019
Oct Human Genetics (HG632). Guest Lecturer, Genetic Training Program
Mar Microbial Physiology (MCDB 600). Guest Lecturer
2018
Oct Biophysics Seminar Series. Speaker
2017
Nov Department of Microbiology and Immunology Seminar Series
Oct Quantitative Biology Seminar Series. Speaker

TEACHING

BIO 207: Introductory Microbiology (W18, W19, W20, W21, W22, W23, W24)
- Taught 50% of course with 150 to 230 undergraduates enrolled
- Lectured on topics including microbial growth, cell biology, and molecular biology
- 2019 Undergraduate Teaching Excellence Award, Program in Biology

MCDB 472: Building a Synthetic Cell (F18, F20, F22, F24)
- Designed and taught entire course with 25-30 undergraduates enrolled
- Course addresses a grand scientific challenge of this century: building a from scratch
- Students learn how we define a cell as “living” & where the transition from chemistry to biology lies
- 2018 Undergraduate Teaching Excellence Award, Program in Biology

MCDB 600: Microbial Physiology (F19, W20)
- Graduate students and postdocs present their research on the physiology and molecular biology of bacteria and phage.
- Course coordination and speaker scheduling

MCDB 614: Experimental Models in Molecular, Cellular and Developmental Biology (F17)
- Taught two weeks of this graduate-level course designed to introduce students to research approaches & model organisms
- Also performed Checkpoint #1 exam preparation, office hours, and grading

MENTORSHIP

Postdoctoral Fellows:

Y Hoang		Since F20
Joshua MacCready	(Michigan Life Sciences Postdoctoral Fellow, MCDB)	S18-W21

Now a Senior Research Associate - Center for Catalysis in Biomimetic Confinement at MSU

Graduate Students:

Jessica Panchaud	PhD student, MCDB	Since W24
Rachelle Baumann	PhD student, Biological Chemistry	Since W24
Jordan Byrne	PhD student, MCDB, CBTP T32 Training Grant	Since W22
Claire Dudley	PhD student, MCDB, RMF funded	Since W22
Claudia Mak	PhD student, Biological Chemistry	Since W21

Joseph Basalla	PhD student, MCDB	W19 - F23
	Now a Postdoctoral Fellow – Dr. Priya Banerjee's Lab at University of Buffalo	
Lisa Pulianmackal	PhD student, Micro/Immunology, NSF GRFP	W18 - F22
	Now a Postdoctoral Fellow – Dr. Beth Winger's lab at UCSF	
Pusparanee Hakim	PhD Graduate student, MCDB	W17 - F21
	Now a Senior Research Associate - Dr. Luke Chao's Lab at Harvard Medical School	
Rees Rillema	Masters Pathways student, MCDB	F18 - W20
	Now a PhD Candidate - Molecular Plant Science program at MSU	

Graduate Rotation Students:

Alice Youle	Biological Chemistry, W24
Tyler Brant	Biological Chemistry, F23
Kimberly Edicha	Biological Chemistry, F23
Rachelle Baumman	Biological Chemistry, F23
Katherine Wentworth	MCDB, W23
Claire Albright	MCDB, W23
Carla Peralta	PCB, W22
Sarah VanDiepenbos	MCDB, W22
Holly Scheer	MCDB, F21
Miguel Jose Limcaoco	Bioinformatics, F21
Keerthikka Ravi	MCDB, W21
Christopher Azaldegui	Chemical Biology, W20
Christian Kelley	Biophysics, F19
Malak Bazzi	MCDB, W19
Lotte Van den Goor	MCDB, W18
Ritvija Agrawal	MCDB, W18
Candiliane Serrano Zayas	PIBS, CMB, W18
Ce Wang	MCDB, W17

Undergraduates:

Erin Turnbach	Lab Assistant	Since F23
Olivia LaCommare	Lab Assistant	Since S23
Tamara Monjaras	Lab Assistant	Since S23
Annabelle Kwon	Lab Assistant	Since S23
Rachel Dow	MCDB 300/400, Honors thesis	F22-W24
Michael Tarcea	MCDB 300/400	F22-W24
Jhih-Ling Yang	Work-study student	W22-W24
Maria Ghalmi	Work-study student, MCDB 300/400	S21-S23
Giselle King	Work-study student	F21-W23
Xiaoyi Li	Volunteer	W22-S22
Jeffery Zhang	Work-study student and NSF REU	S18-S20
Jesus Galvez	UROP, sophomore	F19-S20
Molly Cavanaugh	Volunteer	F18-S19
Sinyu Yang	Work-study student, MCDB 300/400, Honors thesis	F19 – S21
	Went on to Wayne State Medical School	
Avery Liu	Work-study student	W17-S18
	Went on to UNC School of Pharmacy	
Jessica Zhang	Honors thesis	F17-S18
	Went on to PhD program in Biology, Stanford	
Brice Calco	Honors thesis	F17-S18
	Went on to a Intramural Research Training Award, National Institutes of Health	
Ian Lemersal	UROP, sophomore	F17-S18
	Went on as a Research Technician, Scripps	

Sponsored/Co-sponsored undergraduate independent research for credit:

Sabrina Kolb	MCDB Honors Thesis Reader	F24
Lia Munson	MCDB Honors Thesis Reader	W24
Lily Kalcec	MCDB Honors Thesis Reader	W24
Kemal Demirer	MCDB Honors Thesis Reader	W24
Nadir Al-Saidi	MCDB Honors Thesis Reader	W23
Lina Jeffery	MCDB Honors Thesis Reader	W23
Jolene Iseler	MCDB Honors Thesis Reader	W23
Lara Mutluay	Co-Sponsor, MCDB 400	S21
Gaurie Gunasekaran	Co-Sponsor, MCDB 300	W21 & F21
Anati Azhar	MCDB Honors Thesis Reader	W20
Yu-En Huang	Co-Sponsor, MCDB 400	W20
Jordan McKaig	Co-Sponsor, MCDB 300	W19
Sierra Bowden	Co-Sponsor, MCDB 300	W19

Graduate Thesis/Prelim. Committee (in addition to my own students):

Kelyah Spurgeon (chair), Kozik Lab, MCDB	Since 2024
Katherine Wentworth, Nandakumar Lab, MCDB	Since 2023
Hannah Navarrete, O'Riordan lab, CMB	Since 2023
Xiaofeng Dai, Biteen Lab, Chemistry	Since 2022
Jian Guan, Jakob Lab, MCDB	Since 2022
Divya Kolli (chair), Chapman Lab, MCDB	Since 2022
Julianna Cresti, Simmons Lab, MCDB	Since 2022
Aravintha Siva (chair), DeSantis Lab, MCDB	Since 2022
Willow Morgan, Freddolino Lab, Biological Chemistry	Since 2022
Jennie Hibna, Simmons lab, MCDB	Since 2022
Keerthikka Ravi, Huffnagle lab, MCDB	Since 2022
Hossein Moghimian, Liu Lab, Biomedical Engineering	Since 2022
Frances Caroline Lowder, Simmons lab, MCDB	Since 2021
Christopher Azaldegui, Biteen lab, Chemistry	Since 2020
Franco Tavella, Yang lab, Biophysics	Since 2020
Roesha Andre, Chapman lab, MCDB	Graduated 2023
Robert Benisch, Giessen Lab, Biomedical Engineering	Graduated 2024
Lotte Van den Goor, Miller lab, MCDB	Graduated 2023
Aric Brown, Mobley Lab, Microbiology & Immunology	Graduated 2023
Katherine Wozniak, Simmons lab, MCDB	Graduated 2022
Sujeet Bhoite, Chapman lab, MCDB	Graduated 2022
Tim Mladenovic, Pichersky lab, MCDB	Graduated 2021
Claire Dudley, Miller lab, MCDB	Graduated 2021
Sagardip Majumder, Liu Lab, Biomedical Engineering	Graduated 2019

OUTREACH

Since 2021 **Developed the exhibit "Algae and the Climate Crisis" in the People & the Planet gallery at the UM Museum of Natural History**. The interactive exhibit explains climate change, the role cyanobacteria and carboxysomes have in carbon fixation, and ways for combating climate change. Exhibit opened Fall 2022.

Since 2021 **Developed "Microworlds": A hands-on workshop for K-12 students at the UM Museum of Natural History**. Students assemble and keep the $1 Foldscope to observe the microbial world around them. Students prepare, mount, and image microbial samples and share their images.

2023 **Lecturer & Panelist for the Farrand Lecture "Counter-Culture: The art and science of microbes".** In-person and live-streamed public event recorded and hosted by the UM Museum of Natural History (https://lsa.umich.edu/ummnh/visitors/things-to-do/farrand-lecture.html)

2019 **Hands-on presentations at Pittsfield Ann Arbor Library & UM Museum of Natural History**. Presented an activity developed by PhD student Lisa Tran that describes how cells use transport systems to ensure inheritance of essential components.

2018 **Speaker in a Science Café session called "Cyanobacteria: Toxic Tide or Treasure?"** held by the Museum of Natural History. Public audience discusses current science with experts. Podcast is available on the Museum website.

2018 **Hands-on presentations at The Young Scientists Expo**, held by the Association for Women in Science (AWIS). Presented an activity related to the research in my lab entitled "How Green Bacteria Clean the Air" to hundreds of middle-school students and their families.

2017 **Hands-on presentations at UM Museum of Natural History**, presented an activity related to the research in my lab entitled "How Green Bacteria Clean the Air" to museum visitors for the following events: Scientists Spotlights and Discovery Days.

2017 **Participant in the Science Communication Fellows Program at the UM Museum of Natural History**, participated in two professional development workshops focused on building the skills to effectively engage public audiences and developing an inquiry-based hands-on activity to showcase the research in my lab to Museum visitors.

INTERNAL SERVICE

Molecular, Cellular, and Developmental Biology Department:

Since 2023	MCDB Executive Committee
Since 2022	MCDB Graduate Admissions Committee
Since 2020	MCDB Social Media Committee - Chair
Since 2018	Microbiology Major Curriculum Steering Committee
2021 - 2022	MCDB Faculty Search Committee
2017 - 2020	MCDB Graduate Admissions Committee

Microbiology and Immunology Department:

2018	Checkpoint #1 Exam Committee

OTHER UNIVERSITY OF MICHIGAN SERVICE

Since 2021 **Advisory Committee Member**. Students Engaging with Community Outreach and New Disciplines (SECOND). Science Communication Training Program

Since 2017 **Panelist**. "The Faculty Search Process: On-campus Interview" – NextProf Workshop

2020-23 **Advisory Committee Member**. BioArtography

2020-21 **Panelist**. LSA Dean's Office & Advance's NSF CAREER Workshop

2018-20 **Presenter**. PIBS Graduate Student Recruitment Poster Session

2018-2020 **Mentor**. Undergraduate Research Opportunity Program (UROP)

2019-20 **Panelist**. Future In Research, Science & Teaching (FIRST) for undergraduates

2018 **Panelist**. Diversity, Equity and Inclusion – Science Branding with Social Media

EXTERNAL SERVICE

2027 **Chair Elect**. GRC Bacterial Cell Biology and Development

2025 **Guest Editor**. Special Issue of Current Opinion in Microbiology

2025 **Vice Chair Elect**. GRC Bacterial Cell Biology and Development

2022-2023 **Vice Chair**. Program Committee for Molecular Biology & Physiology Track. American Society for Microbiology
Since 2021 **Postdoc Advisory Committee Member** for Dr. Amilcar Perez. Jie Xiao Lab, Johns Hopkins
2021 **Candidate Evaluator**. Otto Hahn Medal. Max Planck Institute, Germany.
2021 **Attendee & Poster Judge**. ABRCAMS.
2018 **Speaker**. Career Symposium. Molecular Genetics Dept, University of Toronto, ON, Canada
2017 **Panelist**. Career Symposium. Molecular Genetics Dept, University of Toronto, ON, Canada

Reviewer for journals (~ 1 manuscript per month):
Cell, eLife, Science Advances, Cell Systems, PLOS Genetics, Journal of Molecular Biology, Nature Communications, *mBio*, *Applied & Environmental Microbiology*, *Journal of Bacteriology, Molecular Microbiology, and several others.*

PROFESSIONAL AFFILIATIONS

Since 2014 American Society for Cell Biology (ASCB) member
Since 2010 American Society for Microbiology (ASM) member

PROFESSIONAL DEVELOPMENT

Since 2017 **MORE Mentoring Workshop** with every graduate student that joins my lab
2021 **STRIDE** Faculty Recruitment Workshop
2019 **CRLT** Workshop: It's in the Syllabus & Other First Gen College Student Experiences
2018 **CRLT** in-class observation and consultation, MCDB 472
2018 **CRLT** in-class observation and consultation, BIOL 207
2017 **LSA Teaching Academy**

IN THE NEWS

2024 Interviewed by *Quanta Magazine* Podcast on paper published in Nature.
"Even Synthetic Life Forms with a Tiny Genome Can Evolve"

2023 Interviewed by *Quanta Magazine* for comment on paper published in Nature.
"Even Synthetic Life Forms with a Tiny Genome Can Evolve"

2021 Interviewed by *Science Magazine* for comment on paper published in Cell.
"Scientists coax cells with the world's smallest genomes to reproduce normally"

2019 Interviewed by *Quanta Magazine* for comment on organelles and bacteria.
"Bacterial Complexity Revises Ideas About 'Which Came First?"