ANTHONY G. VECCHIARELLI

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

2010 **Ph.D.** in Molecular Genetics
Department of Molecular Genetics, University of Toronto, Ontario, Canada

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

CURRENT POSITION

Assistant Professor
Department of Molecular, Cellular, & Developmental Biology
College of Literature, Science and the Arts
University of Michigan, Ann Arbor
2017 – Present

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	Genetics Training Grant - Faculty Member
Since 2017	Cellular Biotechnology Training Program – Faculty Member
Since 2017	Program in Biomedical Sciences – Faculty Member
2017-2019	Molecular Mechanisms in Microbial Pathogenesis Training Grant – Faculty Member

GRADUATE 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 **Graduate Student**, Department of Molecular Genetics, University of Toronto
Advisor: Dr. Barbara Funnell
Thesis Project: Analysis of the Nucleoprotein Complexes Essential for Plasmid Partition

HONOURS AND AWARDS

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

PROFESSIONAL AFFILIATIONS

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

EXTERNAL FUNDING

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: "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: **Active**

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: **Active**

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: **Active**

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

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**)
2019 Rackham Candidate Research Fellowship: Joseph Basalla (**$1,500**)
2018-2021 Michigan Life Sciences Postdoctoral Fellowship: Joshua S. MacCready (**$25,000/year**)
2018 Rackham Candidate Research Fellowship: Lisa Tran and Rees Rillema (**$1,500**)
2017 Rackham Candidate Research Fellowship: Pusparanee Hakim (**$1,500**)

PUBLICATIONS

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

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

1. 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

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

2. 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, a system to study how cells divide

   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.

3. 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.

4. 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.

5. 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.

6. 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 experimental design and developed plasmid constructs.

7. 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

8. 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 is Dr. Vecchiarelli's PhD student 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%.

9. 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.

10. 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

Manuscript Preprints

1. Basalla JL[#], Mak CA[#], Limcaoco JM[#], **Vecchiarelli AG**. The carboxysome-positioning protein McdB of Synechococcus elongatus forms condensates as a hexamer with disordered pH-sensing N-terminal MoRFs. *BioRxiv*.

2. Pulianmackal LT[#], Ravi K[#], Limcaoco JM[#], Yang S[#], Tran MK[#], Zhang J[#], **Vecchiarelli AG**. Multiple ParA/MinD ATPases separately position disparate cargos in a bacterial cell. *BioRxiv*.

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

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

2. 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.

3. 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

4. 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"

5. 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

6. 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

7. 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)

May 2022	Cell Biology and Molecular Genetics Seminar Series – University of Maryland. In-person
Apr 2022	Cell Biology Seminar Series – Sick Kids Hospital, University of Toronto, ON, Canada. Virtual
Apr 2022	Bacteriology Seminar Series – University of Wisconsin-Madison. Virtual
Apr 2022	Bacterial Cell Biology Seminar Series – UC Louvain. Brussels, Belgium. Virtual
Apr 2022	Biochemistry Seminar Series – University of Nebraska. Virtual
Apr 2022	Anatomy and Cell Biology Seminar Series – Western University. Virtual
Mar 2022	Molecular Biology and Biochemistry Seminar Series – Simon Fraser University. Virtual
Dec 2021	Cell Bio Virtual – ASCB/EMBO Meeting. Virtual
Oct 2021	Institute of Molecular Biology Seminar Series – University of Oregon. Virtual
Jun 2021	ASM World Microbe Forum. Virtual Session Chair and Speaker.
Mar 2021	Department of Biology Seminar Series. Virtual Talk. Brandeis University
Nov 2020	CauloConference 2.0. Virtual
Aug 2020	Plant and Microbial Cytoskeleton GRC. Proctor Academy, Andover, NH, US Session Chair, postponed due to COVID
July 2020	Lorentz Workshop on Reconstituting Biology. Leiden, Netherlands Invited Speaker, postponed due to COVID
July 2020	Symposium on Inorganic Carbon Utilization by Photosynthetic Organisms, Princeton University Invited Speaker, postponed due to COVID
Dec 2019	American Society for Cell Biology Annual Meeting, Washington, DC
Oct 2019	Biology Seminar Series, University of Toronto, Mississauga, ON
Sept 2019	Biological Sciences Seminar Series, Wayne State University, Detroit, MI
July 2019	Laboratory of Molecular Biology Seminar Series, NIH, Bethesda, MD
May 2019	Midwest Conference on Protein Folding, Assemblies & Molecular Motions, Notre Dame, IN
April 2019	Cell Biology of Prokaryotes Conference, Bad Staffelstein, Germany

April 2019 Microbiology Seminar Series, Max Planck Institute, Marburg, Germany
June 2018 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 2018 Molecular Biology Seminar Series, University of Wyoming, Laramie, WY
Sept 2017 Biochemistry Department Seminar Series, Duke University, Durham, NC
Sept 2017 Lambda Lunch, NIH, Bethesda, MD
June 2017 American Society for Microbiology Annual Meeting, New Orleans, LA

Pre-faculty position

Dec 2016 American Society for Cell Biology Annual Meeting, San Francisco, CA
Aug 2016 Molecular Genetics of Bacteria and Phages Meeting, University of Wisconsin-Madison, WI
Feb 2016 Department of Biology, Indiana University Bloomington, Bloomington, IN
Dec 2015 Molecular, Cellular and Developmental Biology, University of Michigan, Ann Arbor, MI
Dec 2015 American Society for Cell Biology Annual Meeting, San Diego, CA
Jun 2015 Nucleic Acids Gordon Research Conference, Biddeford, ME
Dec 2015 Earl Stadtman Symposium, NIH, Bethesda, MD
Jun 2015 Prokaryotic Cell Biology, American Society for Microbiology, Washington, DC
Mar 2015 Department of Biology, Queens University, Kingston, ON, Canada
Dec 2014 Earl Stadtman Symposium, NIH, Bethesda, MD
Dec 2014 Microbiology Department, UC Davis, Davis, CA
Apr 2014 Biochemistry Seminar, Microbiology & Immunology, University of Ottawa, ON, Canada
Mar 2014 American Physical Society Annual Meeting, Denver, CO
Jun 2013 American Society for Microbiology Annual Meeting, Denver, CO
May 2013 Chromosome Dynamics Gordon Research Conference, Barga, Italy
Mar 2013 The Bauer Forum, Harvard University, MA

UNIVERSITY OF MICHIGAN INTERNAL PRESENTATIONS *(Invited Speaker)*

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

RESEARCH PRESENTATIONS BY VECCHIARELLI LAB MEMBERS *(Invited Speaker)*

Dec 2021 Y Hoang. **American Society for Cell Biology**. Virtual Talk.
Mar 2021 Pusparanee Hakim. **Regulation & Development Meeting.** Virtual Talk.
Dept of Molecular Microbiology, John Innes Centre, Norwich, UK
Aug 2020 Sinyu Yang. **Undergraduate Summer Research Symposium**. Virtual Talk
Dept of Microbiology & Immunology, University of Michigan. 2nd Place Speaker Award.
Aug 2019 Joshua MacCready. **Molecular Genetics of Bacteria and Phages Meeting**.
University of Wisconsin-Madison, WI
Oct 2018 Joshua MacCready. **Microbiology Super Group**. University of Michigan
Aug 2018 Joshua MacCready. **Plant & Microbial Cytoskeleton Conference**, **GRC**. Andover, NH
Jun 2018 Pusparanee Hakim. **American Society for Microbiology Annual Meeting**. Atlanta, GA
Mar 2018 Pusparanee Hakim. **Microbiology Super Group.** University of Michigan

LAB POSTER PRESENTATIONS (*Only presenter names are shown*)

Dec 2021 Y Hoang. American Society for Cell Biology. Virtual
Dec 2019 Joseph Basalla. American Society for Cell Biology. Washington, DC
Aug 2019 4 Posters - Pusparanee Hakim (Top 10 of 300 posters), Rees Rillema, Joseph Basalla, Lisa Tran. Molecular Genetics of Bacteria & Phages Meeting. University of Wisconsin-Madison
April 2019 Pusparanee Hakim. Connell Symposium. University of Michigan
Aug 2018 Pusparanee Hakim. Plant & Microbial Cytoskeleton Conference, GRC. Andover, NH
Jun 2018 Pusparanee Hakim. American Society for Microbiology Annual Meeting. Atlanta, GA
Mar 2017 Pusparanee Hakim, Ce Wang (2 independent posters). American Society for Microbiology Regional Meeting. East Lansing, MI

Pre-faculty position – poster presentations by AG Vecchiarelli

Dec 2016 American Society for Cell Biology Annual Meeting. San Francisco, CA, USA
Feb 2016 Biophysical Society Annual Meeting. Baltimore, MD, USA
Dec 2015 American Society for Cell Biology Annual Meeting. San Diego, CA, USA
Jun 2015 Boston Bacterial Meeting. Boston, MA, USA
May 2015 Chromosome Dynamics Gordon Research Conference. Waterville Valley, NH, USA
Feb 2014 Biophysical Society Annual Meeting. San Francisco, CA, USA
May 2013 Chromosome Dynamics Gordon Research Conference. Barga, Italy
Apr 2012 Chromosome Dynamics Workshop. Woods Hole, MA, USA
Feb 2012 Biophysical Society Meeting Annual Meeting. San Diego, CA, USA
May 2009 Chromosome Dynamics Gordon Research Conference. Barga, Italy
Aug 2007 International Symposium on Plasmid Biology. Lake Tahoe, CA, USA

TEACHING

BIO 207: Introductory Microbiology (W18, W19, W20, W21, W22)

- Taught 50% of course with 150 to 200 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)

- 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 August 2020
Joshua MacCready (Michigan Life Sciences Postdoctoral Fellow, MCDB), May 2018 – Jan 2021

Graduate Students:

Claudia Mak Graduate student, Biological Chemistry, Since W21
Joseph Basalla Graduate student, MCDB, Since W19
Lisa Tran NSF GRFP, Graduate student, PIBS – Micro/Immunology Dept), Since W18
Pusparanee Hakim Graduate student, MCDB - Graduated F21
- Now a Senior Research Associate in Dr. Luke Chao's Lab at Harvard Medical School.

Rees Rillema MPathways student, MCDB, Sept. 2018 - Graduated W20
- Now a PhD Candidate in the Molecular Plant Science program at MSU.

Graduate Rotation Students:

Jordan Byrne	MCDB, W22
Carla Peralta	PCB, W22
Sarah VanDiepenbos	MCDB, W22
Holly Scheer	MCDB, F21
Miguel Jose Limcaoco	Bioinformatics, F21
Claire Dudley	MCDB, 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:

Xiaoyi Li Volunteer, Since Feb 2022
Jhih-Ling Yang Work-study student, Since Feb 2022
Giselle King Work-study student, Since Sept 2021
Maria Ghalmi Work-study student, MCDB 300 and 400, Since Mar 2021
Sinyu Yang Work-study student, MCDB 300 and 400, Since Sept 2019
Jeffery Zhang Work-study student and NSF REU, Apr 2018 – Apr 2020
Jesus Galvez UROP, sophomore, Sept 2019 – Apr 2020
Molly Cavanaugh Volunteer, Sept 2018 - Apr 2019
Avery Liu Work-study student, Feb. 2017 - June 2018
- Now a UNC School of Pharmacy

Jessica Zhang 3rd year Honors thesis, Sept 2017 - June 2018
- Now a PhD candidate in Biology, Stanford

Brice Calco 4th year Honors thesis, Sept 2017 - June 2018
- Now a Intramural Research Training Award, National Institutes of Health

Ian Lemersal UROP, sophomore, Sept 2017 - June 2018
- Now a Research Technician, La Jolla Institute for Immunology

Sponsored/Co-sponsored undergraduate independent research for credit:

Lara Mutluay	Co-Sponsor, MCDB 400, S21
Gaurie Gunasekaran	Co-Sponsor, MCDB 300, W21 and 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):

Jennie Hibna, Simmons lab, MCDB (Since 2022)
Hannah Navarrete, Bardwell lab, Biological Chemistry (Since 2022)
Keerthikka Ravi, Huffnagle lab, MCDB (Since 2022)
Roesha Andre, Chapman lab, MCDB (Since 2021)
Frances Caroline Lowder, Simmons lab, MCDB (Since 2021)
Robert Benisch, Giessen Lab, Biomedical Engineering (Since 2020)
Christopher Azaldegui, Biteen lab, Chemistry (Since 2020)
Franco Tavella, Yang lab, Biophysics (Since 2020)
Lotte Van den Goor, Miller lab, MCDB (Since 2019)
Katherine Wozniak, Simmons lab, MCDB (Since 2018)
Sujeet Bhoite, Chapman lab, MCDB (Since 2018)
Tim Mladenovic, Pichersky lab, MCDB (Graduated 2021)
Claire Dudley, Miller lab, MCDB (Graduated 2021)
Sagardip Majumder, Liu Lab, Biomedical Engineering (Graduated 2019)

OUTREACH

2021-2022	**Developing the exhibit "Algae and the Climate Crisis" in the People and 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 opens Spring 2022.
2020-2021	**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.
Winter 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.
Fall 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.
Winter 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.
Fall 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.
Fall 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:

2021-2022	MCDB Faculty Search Committee
Since 2020	MCDB Social Media Committee - Chair
Since 2018	Microbiology Major Curriculum Steering 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 2020 **Advisory Committee Member**. BioArtography
Mar 2020-21 **Panelist**. LSA Dean's Office & Advance's NSF CAREER Workshop
Jan 2018-20 **Presenter**. PIBS Graduate Student Recruitment Poster Session
2018-2020 **Mentor**. Undergraduate Research Opportunity Program (UROP)
Nov 2019-20 **Panelist**. Future In Research, Science & Teaching (FIRST) for undergraduates
May 2017-21 **Panelist**. "The Faculty Search Process: On-campus Interview" – NextProf Workshop
Mar 2018 **Panelist**. Diversity, Equity and Inclusion – Science Branding with Social Media

EXTERNAL SERVICE

Since 2021 **Postdoc Advisory Committee Member** for Dr. Amilcar Perez. Jie Xiao Lab, Johns Hopkins
Nov 2021 **Attendee & Poster Judge**. ABRCAMS. Virtual
June 2018 **Speaker**. Career Symposium. Molecular Genetics Dept, University of Toronto, ON, Canada
Mar 2017 **Panelist**. Career Symposium. Molecular Genetics Dept, University of Toronto, ON, Canada

Reviewer for journals (~ 2 manuscripts 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 DEVELOPMENT

Since 2017 **MORE** Mentoring Workshop with every graduate student
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

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

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