Angela Chen, PhD

Biochemical engineer with a passion for sustainable technologies and inclusion
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POSITIONS AND AFFILIATIONS

Michigan State University East Lansing, MI
Assistant Professor in Chemical Engineering and Materials Science 2025 - present
Adjunct Assistant Professor in Chemical Engineering and Materials Science 08/2024 – 12/31/2024

EDUCATION

The University of Texas at Austin Austin, TX
Ph.D. in Chemical Engineering, May 2021 2015 - 2021
M.S in Chemical Engineering, May 2020

The Ohio State University Columbus, OH
B.S in Chemical Engineering; *Magna Cum Laude* with Honors Research Distinction, May 2015 2011 – 2015
B.S in Biomedical Engineering; *Magna Cum Laude*, May 2015

RESEARCH EXPERIENCE

University of California, Riverside - USDA-NIFA AFRI Postdoctoral Fellow 07/2021 – 09/2024
Department of Microbiology and Plant Pathology, PI: Prof. Hailing Jin
Project – cross-kingdom RNA trafficking and nanomaterials for crop protection

- Developed new nanomaterial systems for improving dsRNA delivery in anti-fungal applications
- Investigation of intercellular RNA trafficking mechanisms in *Arabidopsis thaliana* and the role of extracellular vesicles in cross-kingdom communication between plants and fungal pathogens

University of Texas at Austin - NSF Graduate Research Fellow 08/2015 – 05/2021
Department of Chemical Engineering; Advisors: Prof. Lydia M. Contreras and Prof. Benjamin K. Keitz
Dissertation Title – "Engineering *Deinococcus radiodurans* for Improved Nanoparticle Biosynthesis Using Regulatory RNAs"

- Created new method for cell-free biosynthesis of bimetallic nanoparticles using *D. radiodurans*
- Developed a suite of new constitutive promoters for genetic engineering in *E. coli* and *D. radiodurans*
- Established the use of small RNAs as a new engineering platform for metal nanoparticle biosynthesis using bioinformatics, genetic knockouts, and materials characterization techniques

Massachusetts Institute of Technology - MIT Summer Research Program (MSRP) Intern 06/2014 – 08/2014
Department of Chemical Engineering; Advisor: Prof. Kristala Prather
Project – Biosynthesis of 3-hydroxybutryolactone using *Escherichia coli*

- Constructed and characterized 4 novel biosynthetic pathways in *E. coli* for chiral hydroxyacid production
- Determined fermentation product distributions and yields via HPLC and LC/MS techniques

University of Massachusetts Amherst - Institute for Cellular Engineering (ICE) REU Intern 06/2013 – 08/2013
Department of Chemical Engineering; Advisor: Prof. Susan Roberts
Project – Effect of methyl jasmonate on paclitaxel production by *Taxus* cell cultures

- Studied dynamic effects of methyl jasmonate elicitation on multiple plant-cell suspension cultures
- Analyzed plant metabolite production via UPLC and lignin staining and assessed morphological changes in *Taxus* cultures using a Multisizer

The Ohio State University - Undergraduate Honors Researcher 01/2012 – 05/2015
Department of Chemical and Biomolecular Engineering; Advisor: Prof. David W. Wood
Honors Thesis - "Development of Animal-Based Bacterial Biosensors for the Detection of Estrogenic Compounds"

- Constructed *E. coli* biosensors that mimic animal responses to estrogenic compounds
- Optimized biosensor sensitivity using protein engineering and high-throughput screening methods

FUNDING AND SELECTED AWARDS

Michigan Blueberry Commission	2025 – 2026
Cornell NIH FIRST Future Faculty Symposium	2023
IS-MPMI Shimamoto Travel Award	2023
USDA-NIFA AFRI Postdoctoral Fellowship	2023 – 2025
New England Future Faculty 2022 Workshop	2022
UT Austin College of Engineering Graduate Certificate in Engineering Education	2020
NextProf Nexus 2019 Workshop	2019
UT Austin Office of Graduate Studies Professional Development Award	2018
Thrust 2000 – Celanese Corporation Endowed Graduate Fellowship in Engineering	2015 – 2019
National Science Foundation Graduate Research Fellowship	2015 – 2020
American Institute of Chemists Outstanding Undergraduate Award	2015
OSU Department of Chemical Engineering Outstanding Undergraduate Award for Research Excellence	2014
OSU Milton H. and Karen L. Hendricks Scholarship (only 1 scholarship awarded annually)	2013 – 2015
OSU's Maximus and Elliott Scholarships	2011 – 2015

PUBLICATIONS (* denotes equal contribution, undergraduate authors)

13). **A. Chen**, L. Halilovic, J-H. Shay, A. Koch, N. Mitter, and H. Jin. 2023. "Improving RNA-based crop protection through nanotechnology and insights from cross-kingdom RNA trafficking". *Current Opinion in Plant Biology* 76:102441.

12). B. He, H. Wang, G. Liu, **A. Chen,** A. Calvo, Q. Cai, and H. Jin. 2023. "Fungal small RNAs ride in extracellular vesicles to enter plant cells through clathrin-mediated endocytosis". *Nature Communications* 14:4383.

11). Q. Cai, L. Halilovic, T. Shi, **A. Chen**, B. He, H. Wu, and H. Jin. 2023. "Extracellular vesicles: cross-organismal RNA trafficking in plants, microbes, and mammalian cells". *Extracellular Vesicles and Circulating Nucleic Acids* 4:262-282.

10). L. Qiao, J. Nino-Sanchez, R. Hamby, L. Capriotti, **A. Chen**, B. Mezzetti, and H. Jin. 2023. "Artificial Nanovesicles for dsRNA Delivery in Spray Induced Gene Silencing for Crop Protection". *Plant Biotechnology Journal* 21:854-865.

9). J. Nino-Sanchez, P.T. Sambasivam, A. Sawyer, R. Hamby, **A. Chen**, E. Czislowski, P. Li, N. Manzie, D.M. Gardiner, R. Ford, Z.P. Xu, N. Mitter and H. Jin. 2022. "BioClay^{TM} prolongs RNA interference-mediated crop protection against *Botrytis cinerea*". *Journal of Integrative Plant Biology* 64:2187-2198.

8). **A. Chen**, B. He, and H. Jin. 2021. "Isolation of Extracellular Vesicles from *Arabidopsis*". *Current Protocols* 2, e352.

7). **A. Chen**, J. Hernandez-Vargas, R. Han, O. Cortazar-Martinez, N. Gonzalez, S. Patel, B.K. Keitz, G. Luna-Barcenas, and L.M. Contreras. 2021. "Small RNAs as a New Platform for Tuning the Biosynthesis of Silver Nanoparticles for Enhanced Material and Functional Properties". *ACS Applied Materials & Interfaces* 13:36769-36783.

6). J.K. Villa, R. Han, C-H. Tsai, **A. Chen**, P. Sweet, R. Vaezian, G. Franco, R. Tkavc, M.J. Daly, and L.M. Contreras. 2021. "A small RNA regulates *pprM*, a modulator of pleiotropic proteins promoting DNA repair, in *Deinococcus radiodurans* under ionizing radiation*". Scientific Reports* 11:12949.

5). M.K. Mihailovic, A.M. Ekdahl, **A. Chen**, A.N. Leistra, B. Li, J.G. Martinez, M. Law, C. Ejindu, E. Massé, P.L. Freddolino, and L.M. Contreras. 2021. "Uncovering transcriptional regulators and targets of sRNAs using an integrative data-mining approach: H-NS-regulated RseX as a Case Study". *Frontiers in Cellular and Infection Microbiology* 11:696533.

4). **A. Chen**[*], M.W. Sherman[*], C. Chu, N. Gonzalez, T. Patel, and L.M. Contreras. 2019. "Discovery and Characterization of Native *Deinococcus radiodurans* Promoters for Tunable Gene Expression". *Applied Environmental Microbiology* 85(21): e01356-19. (Paper featured in issue's cover).

3). **A. Chen**, B.K. Keitz, and L.M. Contreras. 2018. "Biological links between nanoparticle biosynthesis and stress responses in bacteria". *Mexican Journal of Biotechnology* 3(4):44-69.

2). **A. Chen**, L.M. Contreras, and B.K. Keitz. 2017. "Imposed Environmental Stresses Facilitate Cell-Free Nanoparticle Formation by *Deinococcus radiodurans"*. *Applied Environmental Microbiology* 83:1–14.

1). M.K. Mihailovic[*], **A. Chen**[*], J. C. Gonzalez-Rivera, and L.M. Contreras. 2017. "Defective Ribonucleoproteins, Mistakes in RNA Processing, and Diseases". *Biochemistry* 56(10): 1367-1382.

WORKS IN PROGRESS

2). J. Nino-Sanchez, H. Wu, **A. Chen**, R. Hamby, S. Dao, and H. Jin. "Engineered bacterial extracellular vesicles can enable gene silencing and plant protection against foliar and soil-borne fungal pathogens*"*. (in preparation)

1). **A. Chen***, A. Cordova*, S.M. Engels, J.K. Villa, Y. Gao, S. Patel, and L.M. Contreras. "Dual sRNA-mediated regulation of pyruvate metabolism and nitroreductase controls bacterial redox activity in *Deinococcus radiodurans*". (in preparation)

SELECTED PRESENTATIONS (Honors and Awards in bold)

12). "Plant-Derived Nanovesicles for Nucleic Acid Delivery to Microbial Pathogens for Spray Induced Gene Silencing and Genetic Engineering.", Nanoscale Science and Engineering for Agriculture and Food Systems GRS, June 2024 (**Oral, Best Speaker award**)

11). "Improving spray-induced gene silencing for crop protection using nanoparticles." International Society for Molecular Plant Microbe Interactions (IS-MPMI) Congress, July 2023. (**Poster**)

10). "Organic Nanovesicles are ideal RNA delivery carriers for Spray-Induced Gene Silencing.", TropAg Conference, October 2022. (**Oral, selected symposium speaker**)

9). "Engineering *Deinococcus radiodurans* for improved nanoparticle biosynthesis using regulatory RNAs.", UC Riverside Plant Pathology Seminar Series, September 2022. (**Oral, invited speaker**)

8). "Development of Plant-Derived Nanovesicles for Anti-Fungal Strategies." Riverside Postdoctoral Association's Symposium (virtual), April 2022. (**Oral, Judge's choice for Top 3 presentation**)

7). "Engineering *Deinococcus radiodurans* for Improved Nanoparticle Biosynthesis Using Small RNAs.", Central US Synthetic Biology Workshop, September 2021. (**Oral**)

6). "Application of natural RNA regulators to tune biosynthesis of nanoparticles for enhanced material and functional properties." SEED Conference, June 2021. (**Poster**)

5). "Controlling the properties and biosynthesis of metallic nanoparticles by *Deinococcus radiodurans* through applied environmental stresses." Engineering Biology Research Consortium (EBRC) Annual Meeting, April 2020. (**Poster, Certificate of Award for Top 3 presentation**)

4). "The effect of small RNAs on the biosynthesis and properties of metallic nanoparticles." Graduate and Industry Networking (GAIN), February 2020. (**Poster, Burnt Orange Award for Top 4 presentation**)

3). "Utilizing native metabolic pathways in *Deinococcus radiodurans* for metallic nanoparticle biosynthesis." American Institute for Chemical Engineers (AIChE) National Meeting, Oct. 2018. (**Oral**)

2). "Development of Animal-Based Bacterial Biosensors for the Detection of Endocrine Disruptors." Denman Undergraduate Research Forum, Ohio State University, March 2013. (**Poster, 2nd place in Engineering**)

1). "Development of Animal-Based Bacterial Biosensors for the Detection of Endocrine Disruptors." American Institute for Chemical Engineers (AIChE) Annual Student Meeting, October 2012. (**Poster, 2nd Place Student Poster Award – Food, Pharmaceutical, and Bioengineering Division**)

TEACHING EXPERIENCE

Graduate Certificate in Engineering Education, *UT Austin Cockrell School of Engineering* May 2020
- Completed coursework on current pedagogical techniques, inclusive classrooms, and learning styles
- Designed curriculum for courses on Nanotechnology and Thermodynamics

Graduate Teaching Assistant – *University of Texas at Austin* Spring 2018 & 2019
Course – CHE 322: Thermodynamics
- Designed and taught 5 70 minute interactive lectures on fundamental principles in thermodynamics
- Led weekly recitations on class material, graded quizzes, and provided support through office hours

Graduate Teaching Assistant – *University of Texas at Austin* Fall 2017
Course – CHE 210: Introduction to Computing
- Led bi-weekly clinics on using Excel tools to solve chemical engineering problems (mass balances)

Graduate Student Lecturer – *University of Texas at Austin* June 2017, 2018, & 2019
Course – NASCENT Center Nanotechnology Summer Boot Camp
- Developed and led a silver nanoparticle lab using green chemistry and TEM session with 10 high schoolers
- Collaborated with camp leaders and presented lectures on statistics, ethics, and nanotechnology careers

Undergraduate Teaching Assistant – *The Ohio State University* Spring 2015
Course – CHEM 2550: Organic Chemistry Laboratory 2
- Guided 16 students in weekly organic chemistry labs focused on synthesis and characterization

Undergraduate Teaching Assistant – *The Ohio State University* 2013 - 2014
Courses – CBE 2200: Process Fundamentals, CBE 3421: Transport Phenomena II
- Assisted students on questions regarding class material through office hours, tutoring, and e-mail
- Graded homework/exams and worked with the professor and graduate TAs to refine class content

LEADERSHIP AND OUTREACH EXPERIENCE

President, Riverside Postdoctoral Association (RPA) - *University of California, Riverside* 07/2022 – 09/2024
- Led discussions with senior administrators to create a resource handbook for postdocs and establish the 1st annual Postdoctoral Excellence Awards at UCR
- Spearheaded collaborations with the Graduate Division and Riverside Underground Scholars program to create a formal mentorship series and programming for postdocs to support undergraduate and PhD students

Mentor, First Generation Mentorship Program - *University of California, Riverside* 08/2022 – 09/2024
- Advise undergraduates on campus resources and professional development through biweekly meetings

Peer Mentor, First ChENNECTIONS Program – *University of Texas at Austin* 07/2020 – 12/2020
- Mentored two female first-year graduate students through email and virtual weekly meetings
- Provided support on topics such as advisor selection, work/life balance, and professional development

Enrichment Chair, Graduate Leadership Council (GLC) – *University of Texas at Austin* 10/2016 - 10/2019
- Revived student-invited faculty seminar series and hosted professional development panels and workshops
- Created monthly initiatives ("Lunch with a Longhorn") to make department more inclusive and welcoming

Volunteer, K-12 Outreach Programs – *University of Texas at Austin*
Program - *Breakthrough Austin/My Introduction to Engineering (MITE)* Summer 2015 - 2019
Program - *Girl Day* March 2016 & 2017
- Introduced biotechnology and engineering to high schoolers from low-income and minority backgrounds through dynamic presentations and experiments
- Led science demonstrations for girls from 5-13 years old and their families for UT Austin's Girl Day

Undergraduate Mentor, Translating Engineering Research K-8 Program – *The Ohio State University* Fall 2014

- Introduced middle school students to engineering and research through weekly interactive clinics
- Designed and managed two clinics on enzymes in metabolic engineering where students designed their own "enzymatic pathways" for transforming chocolate and caramel candies into Milky Way bars

ADVISING OF UNDERGRADUATE AND GRADUATE STUDENTS

Graduate Students Advised at MSU

- Nazharie Brandon – *Michigan State University (Graduate)* 2025 –present
- Victoria Giese – *Michigan State University (Graduate)* 2025 –present

Graduate and Undergraduate Research Mentees prior to MSU

- Nazharie Brandon – *Michigan State University (Graduate)* 2025 –present
- Victoria Giese – *Michigan State University (Graduate)* 2025 –present
- Rachael Hamby – *University of California, Riverside (Graduate)* 2021 – 2024
- Lida Halilovic – *University of California, Riverside (Graduate)* 2024
- Sydney Dao – *University of California, Riverside (Undergraduate)* 2023 – 2024
- Zachary Wachter – *University of California, Riverside (Undergraduate)* 2023 – 2024
- Jia-Hong Shay – *University of California, Riverside (Undergraduate)* 2022 – 2023
- Miguel Rito – *University of Coimbra, Portugal (Fulbright Fellow/Graduate)* 2021 – 2022
- Antonio Cordova – *University of Texas at Austin (Graduate)* 2021
- Fan Zhang – *University of Texas at Austin (Graduate)* 2021
- Sonia Patel – *University of Texas at Austin (Undergraduate)* 2019 – 2021
- Natalia Gonzalez – *University of Texas at Austin (Undergraduate)* 2018 – 2020
- Tulshi Patel – *University of Texas at Austin (Undergraduate)* 2017 – 2019
- Cynthia Chu – *University of Texas at Austin (Undergraduate)* 2016 – 2019
- Sunjna Kohli – *University of Texas at Austin (Undergraduate)* 2017 – 2018
- Louis Kirkley – *University of Texas at Austin (Undergraduate)* 2016 – 2017

High School Research Mentees prior to MSU

- Karen Martinez Perez – *Awty International School* 2019
- Ryan Sze – *Westwood High School* 2017 – 2018