ANTONIO DEL RIO FLORES

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Education

Assistant Professor in Chemical and Biological Engineering, University of Colorado Boulder **Starting Jan. 2026**

Stanford Science Postdoctoral Fellow, Stanford University (advisor: Chaitan Khosla) **July 2023-Dec. 2025**

Ph.D., Chemical Engineering, University of California, Berkeley (advisor: Wenjun Zhang) **Aug. 2018-June 2023**

B.S., Chemical Engineering/Biochemical Engineering, University of California, Davis **Sep. 2013-June 2018**

Awards and Honors

UC Davis Chemical Engineering Departmental Citation	**2018**
UC Berkeley Chancellor's Fellowship	**2018-2020**
UC Berkeley Graduate Remote Instruction Innovation Fellowship	**2020**
UC Berkeley Graduate Student Instructor Excellence Award	**2020**
SIMB Diversity Travel Award	**2021**
SIMB Carol D. Litchfield Best Student Poster Presentation Award	**2021**
UC Berkeley Outstanding Graduate Student Instructor Award	**2021**
ACS Division of Chemical Biology Founder's Award	**2022**
NSF Research Exchange Award	**2022**
UC Berkeley Outstanding Graduate Student Instructor Award	**2022**
Blavatnik Innovation Fellowship	**2023**
Benjamin Boussert Memorial Award	**2023**
AIChE IDEAL Star Award	**2023**
Stanford Science Postdoctoral Fellowship	**2023-2025**
Enzyme Mechanisms Conference Flash Talk Award	**2024**
Carl Storm Underrepresented Minority Fellowship	**2024**
Patten Faculty Fellowship	**2026-2029**

Publications **(*denotes co-first author)**

1. **Del Rio Flores, A.** & Khosla, C. Characterization of the Flavin-Dependent Monooxygenase Involved in the Biosynthesis of the Nocardiosis-Associated Polyketide. *Biochemistry* (2024). doi: 10.1021/acs.biochem.4c00480
2. **Del Rio Flores, A.**[*], Zhai, R.[*], Kastner, D.W., Seshadri, K., Yang, S., De Matias, K., Shen, Y., Cai, W., Narayanamoorthy, M., Do, N.B., Xue, Z., Al Marzooqi, D., Kulik, H.J. & Zhang, W. Enzymatic synthesis of azide by a promiscuous N-nitrosylase. *Nat. Chem.* (2024). doi: 10.1038/s41557-024-01646-2
3. **Del Rio Flores, A.,** Zhai, R. & Zhang, W. Isonitrile Biosynthesis by Non-Heme Iron(II)-Dependent Oxidases/Decarboxylases. *Methods in Enzymology, 704* (143-172) (2024)**.** doi: 10.1016/bs.mie.2024.06.002

4. The Atomwise AIMS Program. AI Is a Viable Alternative to High Throughput Screening : A 318 - Target Study. *Sci. Rep.* **2024**, *14* (7526), 1–16. doi: 10.1038/s41598-024-54655-z.
5. Kishore, S., **Del Rio Flores, A.**, Lynch, S.R., Yuet, K.P., & Khosla, C. Discovery and Characterization of the Fully Decorated Nocardiosis Associated Polyketide Natural Product. *J. Am. Chem. Soc.* (2024). doi: 10.1021/jacs.3c13670.
6. **Del Rio Flores, A.,** Narayanamoorthy, M., Cai, W., Zhai, R., Yang, S., Shen, Y., Xue, Z., Seshadri, K., De Matias, K., & Zhang, W. Biosynthesis of Isonitrile Lipopeptide Metallophores from Pathogenic Mycobacteria. *Biochemistry* (2023). doi: 10.1021/acs.biochem.2c00611.
7. **Del Rio Flores, A.,** Kastner, D.W., Du, Y., Narayanamoorthy, M., Shen, Y., Cai, W., Vennelakanti, V., Zill, N.A., Dell, L.B., Kulik, H.K., & Zhang, W. Probing the mechanism of isonitrile formation by a non-heme iron(II)-dependent oxidase/decarboxylase. *J. Am. Chem. Soc.* (2022). doi:10.1021/jacs.1c12891.
8. **Del Rio Flores, A.,** Barber, C.C., Narayanamoorthy, M., Gu, D., Shen, Y., & Zhang, W. Understanding and Engineering the Biosynthesis of Isonitrile and Alkyne-Containing Natural Products. *Annu. Rev. Chem. Biomol. Eng.* (2022). doi:10.1146/annurev-chembioeng-092120-025140.
9. **Del Rio Flores, A.***, Twigg, F.F.*, Du, Y., Cai, W., Aguirre, D.Q., Sato, M., Dror, M.J., Narayanamoorthy, M., Geng, J., Zill, N.A., Zhai, R., & Zhang, W. Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore. *Nat. Chem. Bio* (2021). doi:10.1038/s41589-021-00895-3.
10. Zhang, H., Goh, N., Wang, J., Pinals, R., Gonzalez-Grandio, E., Demirer, G., Butrus, S., Fakra, S., **Del Rio Flores, A.**, Zhai, R., Zhao, B., Park, S., & Landry, M. Nanoparticle Cellular Internalization is Not Required for RNA Delivery to Mature Plant Leaves. *Nat. Nano.* (2021). doi:10.1038/s41565-021-01018-8.
11. **Del Rio Flores, A.***, Jonnalagadda, R.*, Cai, W., Mehmood, R., Narayanamoorthy, M., Ren, C., Zaragoza, J.T., Kulik, H.J., Zhang, W., & Drennan, C.L. Biochemical and crystallographic investigations into isonitrile formation by a non-heme iron dependent oxidase/decarboxylase. *J. Biol. Chem.* 296, 100231 (2021). doi:10.1074/jbc.RA120.015932.
12. Li, J.S. Du, Y., Gu, D., Cai, W., Green, A., Ng, S., Leung, A., **Del Rio Flores, A.**, & Zhang, W. Discovery and Biosynthesis of Clostyrylpyrones from the Obligate Anaerobe Clostridium roseum. *Org. Lett.* (2020). doi: 10.1021/acs.orglett.0c02656.
13. Huang, Y.-B., Luo, Y.-J., **Del Rio Flores, A.**, Li, L.-C. & Wang, F. N-aryl pyrrole synthesis from biomass derived furans and arylamine over Lewis acidic Hf doped mesoporous SBA-15 catalyst. *ACS Sustain. Chem.* Eng. 0–6 (2020). doi:10.1021/acssuschemeng.0c03578.
14. Skyrud, W., **Del Rio Flores, A.**, & Zhang, W. Biosynthesis of Cyclohexanecarboxyl-CoA Highlights a Promiscuous Shikimoyl-CoA Synthetase and a FAD-Dependent Dehydratase. *ACS Catal.* 10, 3360–3364 (2020). doi: 10.1021/acscatal.0c00406.
15. Huang, Y. B., Cai, W., **Del Rio Flores, A.**, Twigg, F. F. & Zhang, W. Facile Discovery and Quantification of Isonitrile Natural Products via Tetrazine-Based Click Reactions. *Anal. Chem.* (2019). doi: 10.1021/acs.analchem.9b05147.
16. Ren Y, Bai Y, Zhang Z, Cai W, & **Del Rio Flores A.** The Preparation and Structure Analysis Methods of Natural Polysaccharides of Plants and Fungi: A Review of Recent Development. *Molecules*. 2019; 24(17):3122. doi:10.3390/molecules24173122.

Science Writing for the General Public Publications

1. **Del Rio Flores, A.** Unraveling the role of isonitriles for potential TB therapeutics. 2021. https://qb3.berkeley.edu/news/unraveling-the-role-of-isonitriles-for-potential-tb-therapeutics/

Mentoring

Sherry Chen (High School Student SYIP Program and Undergraduate Researcher) **2020-2022**

Indeever Madireddy (High School Student SYIP Program) **2021-2022**

Pranav Akella (High School Student SYIP Program) **2021-2022**

Maanasa Narayanamoorthy (Undergraduate Researcher**)** **2019-2022**

Yuanbo Shen (Undergraduate Researcher)	**2021-2023**
Luisa Dell (Undergraduate Researcher)	**2021-2022**
Siyue Yang (Undergraduate Researcher)	**2021-2023**
Kaushik Seshadri (Undergraduate Researcher)	**2022-2023**
Kyle De Matias (Undergraduate Researcher)	**2022-2023**
Nicholas Do (Undergraduate Researcher)	**2022-2023**
Alexa Zytnick (Rotating Graduate Student Researcher)	**2020**
Di Gu (Graduate Student Researcher)	**2020-2023**
Corey Model (Graduate Student Researcher)	**2023**
Anna Pons (Graduate Student Researcher)	**2024**

Talks

1. "Enzymatic synthesis of azide by a promiscuous *N*-nitrosylase", July 2024. **Del Rio Flores, A.** and Zhang, W. (SynBYSS 2024)
2. "Discovery and Characterization of the Fully Decorated Nocardiosis-Associated Polyketide Natural Product", October 2024. **Del Rio Flores, A.** and Khosla, C. (AIChE 2024)
3. "Enzymatic synthesis of azide by a promiscuous *N*-nitrosylase", July 2024. **Del Rio Flores, A.** and Zhang, W. (GRC Enzymes, Coenzymes, and Metabolic Pathways 2024)
4. "Enzymatic synthesis of azide by a promiscuous *N*-nitrosylase", May 2024. **Del Rio Flores, A.** and Zhang, W. (ASIM 2024)
5. "Discovery of a Pathway for Azide Biosynthesis By a Promiscuous *N*-Nitrosylase", January 2024. **Del Rio Flores, A.** and Zhang, W. (EMC 2024)
6. "Discovery of a Pathway for Azide Biosynthesis By a Promiscuous *N*-Nitrosylase", November 2023. **Del Rio Flores, A.** and Zhang, W. (AIChE 2023)
7. "Maturation of an *Escherichia coli* Ribosomal Peptide Antibiotic by ATP-consuming N-P Bond Formation in Microcin C7", October 2023. **Del Rio Flores, A.** (Christopher T. Walsh Chemical Biology Teach-In)
8. "Biosynthesis of Bioorthogonal Synthons in Natural Products", September 2023. **Del Rio Flores, A.** (SynBYSS 2023)
9. "Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", November 2022. **Del Rio Flores, A.** and Zhang, W. (AIChE 2022)
10. "Probing the mechanism of isonitrile formation by a non-heme iron(II)-dependent oxidase/decarboxylase", August 2022. **Del Rio Flores, A.**, Kastner, D.W., Du, Y., and Zhang, W. (SIMB 2022)
11. "Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", November 2022. **Del Rio Flores, A.** and Zhang, W. (WiscProf 2022)
12. "Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", January 2022. **Del Rio Flores, A.**, Twigg, F.F., Du, Y., and Zhang, W. (EMC 2022)
13. "Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", December 2021. **Del Rio Flores, A.**, Twigg, F.F., Du, Y., and Zhang, W. (CheE Future Faculty Diversity Seminar 2021)

Posters

1. "Biochemical Characterization of the Flavin-Dependent Monooxygenase Required for the Biosynthesis of the Nocardiosis-Associated Glycolipid", October 2024. **Del Rio Flores, A.** and Khosla, C. (AIChE 2024)

2. "Biochemical Characterization of the Flavin-Dependent Monooxygenase Required for the Biosynthesis of the Nocardiosis-Associated Glycolipid", October 2024. **Del Rio Flores, A.** and Khosla, C. (Bay Area Chemical Biology Symposium 2024)
3. "Enzymatic synthesis of azide by a promiscuous *N*-nitrosylase", July 2024. **Del Rio Flores, A.** and Zhang, W. (GRC Enzymes, Coenzymes, and Metabolic Pathways 2024)
4. "Discovery of a Pathway for Azide Biosynthesis By a Promiscuous *N*-Nitrosylase", January 2024. **Del Rio Flores, A.** and Zhang, W. (EMC 2024)
5. "Biosynthesis of Unusual Synthons in Natural Products", January 2023. **Del Rio Flores, A.** and Zhang, W. (4th International Conference on Natural Product Discovery and Development in the Genomic Era)
6. "Probing the mechanism of isonitrile formation by a non-heme iron(II)-dependent oxidase/decarboxylase", November 2022. **Del Rio Flores, A.** and Zhang, W. (AIChE 2022)
7. "Biosynthesis of Unusual Synthons in Natural Products", September 2022. **Del Rio Flores, A.** and Zhang, W. (Bay Area QBI Chemical Biology Symposium)
8. "Probing the mechanism of isonitrile formation by a non-heme iron(II)-dependent oxidase/decarboxylase", July 2022. **Del Rio Flores, A.** and Zhang, W. (The Protein Society: Annual Symposium 2022)
9. "Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", January 2022. **Del Rio Flores, A.**, Twigg, F.F., Du, Y., and Zhang, W. (EMC 2022)
10. "Total Biosynthesis of Triacsin Featuring an N-hydroxytriazene Pharmacophore", August 2021. **Del Rio Flores A.**, Twigg, F.F., Du, Y., and Zhang, W. (SIMB Annual Conference 2021)
11. "Natural Product Biology, Biosynthesis, and Discovery", May 2019. Biohub Inter-lab Confab
12. "Using modern analytical techniques to assess variation of the metabolome and starch functionality of Chinese Yam varieties used in traditional Eastern Medicine", May 2018. **Del Rio Flores A.**, Coats, M., and Beckles, D. (Poster Presentation, UC Davis Research Fair)

Teaching Experience

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley — Jan. 2020- May 2020

- Lead undergraduate and masters students in performing a series of bioprocessing experiments with relevant industrial applications.
- Helped design laboratories for the course and associated handouts/resources for students.

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley — Aug. 2020- Dec. 2020

- Helped re-design class into a remote/hybrid course during the pandemic.
- Lead undergraduate and masters students in performing a series of bioprocessing experiments remotely and hosted an in-person bioreactor demonstration session.

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley — Aug. 2021- Dec. 2021

- Played a pivotal role in course design as an experienced GSI with significant contributions towards experimental design, advising a lecturer about course design, and mentoring graduate and undergraduate students in collaborative projects.

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley — Jan. 2022- May 2022

- Helped to re-design course to satisfy ABET accreditations.
- Developed syllabus and experiments for the course.

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley — Aug. 2022- Dec 2022

- Developed syllabus and experiments for the course.

Biochemical Engineering Laboratory (CBE C170L), UC Berkeley **Jan. 2023- May 2023**

- Developed syllabus and experiments for the course.

Certificate in Teaching and Learning in Higher Education **Aug. 2018-May 2023**

- Attended various teaching workshops related to student learning, course design, establishing an inclusive classroom, and developing novel strategies in assessing student learning

Professional Experience

Lab Manager for Zhang Research Group **May 2020- Sep. 2022**

- Lead a group of graduate students and post doctorate students originating from chemical engineering, chemistry, microbiology, and plant biology.
- Maintained the laboratory by mediating communications with vendors, EHS, manufacturers, and ensuring tidiness always.
- Scheduled and lead group meeting presentations for our group members.

Cell Culture Intern at Genentech **June 2017- Sep. 2017**

- Maintained a series of bench-scale bioreactors for extended periods of time by controlling operating conditions using engineering controls
- Performed small-scale experiments to test the quality and characteristics of products

Technical and Professional Society Memberships

- American Institute of Chemical Engineers (AIChE), American Chemical Society (ACS), and Society for Industrial Microbiology and Biotechnology (SIMB)

Languages

Spanish- Native Language, **Portuguese**- Proficient, **English**- Full Proficiency, **French**- Conversationally Fluent