

ANNALIESE K. FRANZ

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Education

Ph.D., Organic Chemistry, University of California, Irvine 2002
B.S. in Chemistry, *magna cum laude*, Trinity University, San Antonio, TX 1996

Research and Professional Experience

Professor, Department of Chemistry, UC Davis 2020-present
Faculty Director, Undergraduate Research Center, UC Davis 2017-2021
Co-Vice Chair of Undergraduate Affairs, Department of Chemistry, UC Davis 2015-2017
Associate Professor, Department of Chemistry, UC Davis 2013-2020
Assistant Professor, Department of Chemistry, UC Davis 2007

Research Topics at UC Davis: *Catalysis, Enantioselective Synthesis, Bioactive Lipid, Biofuels*

NIH Postdoctoral Fellow with Professor Stuart L. Schreiber, Harvard University 2002-2007

Research Topics: *Organic Synthesis of New Bioactive Molecules, Chemical Genetic Screening*

Graduate Research Associate with Professor Keith A. Woerpel, UC Irvine 1996-2002

Research Topics: *Organic Synthesis, Catalysis and Mechanism*

Research, Mentoring and Teaching Awards

Distinguished Teaching Award for Graduate and Professional Teaching, UC Davis 2018
ADVANCE Scholar Award, UC Davis 2016
Mentoring at Critical Transitions Fellowship Award, UC Davis 2015, 2016
Outstanding Mentor Award, Consortium for Women & Research, UC Davis 2013
Faculty Development Award, UC Davis 2012-2013
ACS Nominee, EuCheMS Organic Division Young Investigator Workshop 2012
ACS Young Academic Investigator, Philadelphia, PA 2012
ACS Women's Chemist Committee, Rising Star Award 2012
Thieme Chemistry Journal Award 2011
NSF CAREER Award 2009-2014
3M Non-tenured Faculty Award 2009-2011
ASUCD Excellence in Education Award Nominee, UC Davis 2009, 2011
Pi Beta Phi Excellence in Teaching Award, UC Davis 2009
National Institutes of Health, Ruth L. Kirschstein National Research Service Award 2002-2005
Abbott Laboratories Graduate Research Fellowship in Chemistry 2000
Outstanding Teaching Assistant, Department of Chemistry, UC Irvine 1997
American Institute of Chemists Award 1996

Leadership, Advisory and Professional Activities

American Chemical Society (ACS)

- Chair (*elected*), Division of Organic Chemistry, 2020-22
- ACS Leadership Institute, 2020
- Member at Large (*elected*), Executive Committee, Division of Organic Chemistry, 2016-2018
- National Organic Chemistry Symposium (NOS), Davis, CA, Local co-Chair, 2017
- Empowering Women of Organic Chemistry (EWOC) Conference, Organizing Committee, 2020-22
Poster session organizing sub-committee, abstract book, networking sessions. Wikipedia,
- EWOC Nor Cal Local Section, founder and advisor, 2021-22
- ACS National Awards Selection Committee, 2020-22 cycle

- *Organometallics* Distinguished Author Lectureship Award Committee, 2021
- *Organic Letters* Outstanding Publication of the Year Lectureship Award Committee, 2022
- *Journal of Organic Chemistry* Lectureship Award Canvassing Committee, 2022, *inaugural year*
- ACS Project SEED Mentor 2011, 2012
- ACS Sacramento local section, Annual Honors & Awards Reception Planning Committee, 2010
- ORGN Session Chair/Moderator at ACS National Meetings and Regional meetings – multiple years
- Reviewer for ACS Petroleum Research Fund – multiple years

Arnold & Mabel Beckman Foundation, Irvine, CA

- Scientific Advisory Council, 2017-23
- Beckman Scholars Program, Executive Committee
Chair, 2016-17; Member 2012-16; Advisory Panel Reviewer 2010-12

NSF Regional I-Corps Immersive Short Course, 2020

Externally Funded Graduate and Undergraduate Training Programs at UC Davis

- NSF LSAMP/CAMP Scholars Program, PI/Director at UC Davis (statewide PI at UC Riverside)
- Dept of Education GAANN Chemistry Fellowship Program and Training Grant
PI/Director, 2013-16; co-PI/co-Director, 2010-2013
- NIH Training Grant in Biomolecular Technology, *Executive Committee, 2012-18*
- NSF REU Program, Department of Chemistry
PI/Director, 2016-20; co-PI/Co-Director (PI, Velazquez), 2020-23; Faculty Mentor, 2012-23
- UCOP-HBCU Initiative
PI/Director Chemistry & Chemical Biology Graduate Admissions Pathways, 2019-20

Howard Hughes Medical Institute (HHMI)

- Driving Change Initiative, *PI/Director, UC Davis, 2020-22*
- Inclusive Excellence Grant, *Leadership Team/CoPI, UC Davis, 2016-22*
- Beyond Diversity Training, *University of Texas Rio Grande Valley, 2020*

Silicon Symposium, Organizing Chair, 2015

UCOP-Coro Systemwide Leadership Collaborative, 2020-21 - year-long program (100+ hours) and group project to develop leadership skills and awareness focusing on cross-functional collaboration

Grant Review Panels and Ad-hoc Reviewing for External Funding Agencies: ACS-PRF, Arnold & Mabel Beckman Foundation, Dept of Energy, NIH/NIGMS, NSF-CBET, NSF-CHE (Catalysis), NSF-CHE (Synthesis), NSF-CHE (CAREER), NSF-CCI, Research Corporation for Science Advancement

Reviewer for *Journal of the American Chemical Society* (32), *Angewandte Chemie, Int Ed English* (13), *Journal of Organic Chemistry* (26), *Organic Letters* (28), *ACS Catalysis* (4), *Organometallics* (9), *Journal of Medicinal Chemistry* (2), *ACS Medicinal Chemistry Letters*, *Journal of Chemical Education* (9), *ACS Combinatorial Science, Energy & Fuels, Chemical Reviews* (4), *Chemistry – A European Journal* (6), *European Journal of Organic Chemistry* (2), *European Journal of Inorganic Chemistry, Tetrahedron Letters, ChemCatChem* (2), *Chemical Communications, Synthesis, Algal Research* (3), *Plant Physiology* (2), *Journal of Phycology, Advanced Synthesis and Catalysis, CrystEngComm, Progress in Lipid Research, New Journal of Chemistry* (2), *Applied Organometallic Chemistry, Phytochemistry, ChemSusChem*

Department/Graduate Group Service

Vice-chair of Undergraduate Affairs, Department of Chemistry, 2015-17

Diversity, Equity, Inclusion and Accessibility Committee, 2021-22

Graduate Admissions Committee, 2020-22 *including holistic admissions training*

Organic Faculty Search Committee, Chair, 2020-21

Peer Evaluation of Teaching Committee, Chair, 2019-21

Grant and Fellowship Review Committee, Chair, 2018-19

Academic Federation Review Committee, 2015-19

Undergraduate affairs committee, 2014-16 (chair in 2015-16)

EH&S Working Group for Safety and Labeling of Novel Materials from Chemical Synthesis, 2013-14

Pyrophorics Mitigation Project Group, 2014-15

Chemistry Club and Outreach Committee, 2007-2015
Organic Chemistry LPSOE Faculty Search Committee, 2015-16
General Chemistry LPSOE Faculty Search Committee, 2013-15
Publicity and Outreach Committee, Chair, 2011-2013
Webpage/Computer Committee, 2009-15
>50 Qualifying Exam Committees (18 serving as Chair)

College and University Service

AggieLaunch Collective, Mentoring Implementation team, Co-captain, 2021-22
Advising for Equity Administrative Advisory Committee, 2021-22
Mentorship for Undergraduate Research Participants in Mathematics and Physical Sciences (MURPPS),
Director 2021-22, co-Director 2017-2021
Faculty Retention and Inclusive Excellence Networks—Designing Solutions (FRIENDS), Community of
Practice Working Group, 2021 *UC's Advancing Faculty Diversity Improved Climate and Retention Program*
Anti-Racism Action Coordinating Team (AACT), 2020-21
Aggie Launch Collective, 2020-21
Writing Center Implementation Group, 2020
College of Biological Sciences, Community of Practice on Experiential Learning, 2018-19
Chancellor's Working Group on Closing the Preparation Gap, 2018-2019
Student Retention Advisory Committee, 2015-2019
University Honors Program, Faculty Mentor, 2014-2019
MPS Day 2017 Planning Committee, 2016-17
Undergraduate Council, Academic Senate Committee, 2014-2017
Scholarship of Teaching & Learning Conference, Planning Committee, 2016-2019
Center for Education Effectiveness, Advisory Board, 2016-17
Vision Committee, College of Letters & Sciences, 2015-2016
Graduate Students of Color (GSoC) Mentoring Program, 2014-2015 (*inaugural year*), 2021-22
Teaching Program Planning and Review Committee, College of L&S, 2012-2014
CCFIT Education Technology Committee, 2014-2015
Young Scholars Program (YSP), UC Davis, Mentor, 2009-2011, 2016
Women in Science and Engineering (WISE), Member of Faculty Advisory Board, 2010-2013
COSMOS, Mentor and Instructor, UC Davis, 2009, 2010

Outreach Activities

AAUW TechTrek, Mentor and Group Leader, "Chemistry of Things that Glow", workshops for 90-100
trekkers, 7th and 8th grade girls, UC Davis, summers 2012-2019
Montgomery Elementary Science Expo Day, Davis, CA, 2017-2019
Young Scholars Program (YSP) Research Talk and Demonstrations, "Chemistry of Things that Glow", UC
Davis, 2015-2019
Blind Chemistry Camp, sponsored by the Lighthouse for the Blind and the National Federation of the Blind
(NFB), Module leader, Napa, CA, 2012-2016
"Elements of Life" Chemistry Plaza Project (Art/Science Fusion & Science Education), Co-Designer and
Scientific Consultant, 2012
Birch Lane Elementary School, Chemistry Show and Demonstrations, Davis, CA, 2012-2014
STEM for Girls, Faculty mentor and group leader, UC Davis, 2012-2016
Girl Scouts of Central California, STEM/Chemistry Badge, Sacramento, CA, 2014
UC Davis Chemistry Club, Advisor & Mentor, outreach activities to >5000 students (K-12) and members
of the public, 2007-2015
Media Training I Workshop, University Communications, UC Davis, May 8, 2007
Presenter, Current Science & Technology Center, Museum of Science, Cambridge, MA, 2007
Presenter for Women in Science Program, Museum of Science, Cambridge, MA, 2005-2007

Courses Taught at UC Davis

CHE 8A, Organic Chemistry (Brief Course) I (*typically >500 students per class*)
CHE 8B, Organic Chemistry (Brief Course) II (*typically >500 students per class*)
CHE 128A, Organic Chemistry I (*Chem & Eng majors, typically >100 students per class*)
CHE 128B, Organic Chemistry III (*Chem & Eng majors, typically 80 students per class*)
CHE 128C, Organic Chemistry III (*Chem & Eng majors, typically 40 students per class*)
CHE 129B, Organic Chemistry II lab (*Chem & Eng majors*)
CHE 219, Organic Spectroscopy
CHE 219L, Organic Spectroscopy Lab
CHE 221E, Catalysis in Modern Organic Synthesis
CHE 231B, Advanced Organic Synthesis
CHE 235, Organometallic Chemistry in Organic Synthesis

First Year Seminars Taught at UC Davis (*most taught multiple quarters/years*)

FRS-CURE: How to breathe in Space? Modeling Algae Life Support Systems in Space and on Earth
FRS-CURE: Molecular Binding Interactions of Organic Molecules for Drug Discovery
FRS: Writing and Creating Children's Books to Teach Science Communication and Inspire Curiosity
FRS: Molecules, Medicines, Materials: Inspirational Stories of Scientific Discovery and Innovation
FRS: Accelerating your Path to Research in Chemical Sciences and Engineering
FRS: Maximizing your Undergraduate Research Experience and Developing your Identity as a Research Scholar

Mentoring and Student Supervision at UC Davis

Current PhD Student Mentees (11): Cody Yothers,^{1,10} Jacob Dalton, Linnea Dalton, Yun-Pu Chang, David Coppage, Adilene Bernal Sanchez, Ravi Kang (AgChem), Kevin Blanco-Herrero, Leah Thompson, Andrew Huss

Former Graduate Students (22 PhDs, 3 MS):

Angel Cobo^{12,13}, PhD 2022, pursuing Entrepreneurship positions
Jake Jagannathan¹¹, PhD 2021, now postdoc in Leibfarth Group, UNC Chapel Hill
Kayla Rude, PhD 2021, now at California Department of Toxic Substances Control (DTSC)
Julia Jennings^{1,3,4}, PhD 2020, now at John I. Haas, Inc.
Austin Kelly¹, PhD 2019, now Director of High Throughput Experimentation facility at U Delaware
Kelsey Mesa¹, PhD 2019, now at UC Berkeley EH&S
Blanca Gomez⁹, MS Pharm Chem 2019, now at RAPT Therapeutics
Brittany Armstrong, PhD 2018, now at Merck
Kayla Diemoz¹, PhD 2018, now at Air Liquide
Sarah Tang, PhD 2018, now at Cytek Biosciences
Andrew Burch¹¹, PhD 2018, now faculty at Cero Coso Community College
Jake MacDonald, PhD 2018, now at Principia Biopharma
Ben Shupe, PhD 2015, now at Colorado State University
Lisa Anderson^{1,2,3}, PhD 2015, Postdoc at MIT, now at Amyris
Nicolas Ball-Jones⁵, PhD 2015, Postdoc at U Minnesota, now at Hexcel
Elisa Gutierrez⁵, PhD 2014, Postdoc at USC, now at PolyPeptide Laboratories
Ngon Tran^{5,6,7}, PhD 2014, now at Army Research Labs
Sean Wilson¹, PhD 2014, now at Intel
Diana Wong, PhD 2014, now at Agilent
Joe Badillo², PhD 2014, Postdoc at Princeton, now faculty at Seton Hall University
John Schreiber^{1,5}, MS Chemistry 2014, now at AMPAC Fine Chemicals
Megan Danielewicz, PhD 2013, Postdoc at UCSF, now at Corden Pharma
Taewoo Min¹, PhD 2012, now at Gelest

Nadine Hanhan^{3,4,8}, PhD 2012, now at Intel

Kaleb Jentzsch¹, PhD Candidate, December 2008 – June 2012, now at Boehringer Ingelheim

Aziza Sahin, MS Pharm Chem 2010, now at Royal DSM

Awards and Fellowships: ¹Bradford Borge Fellowship, ²NSF Graduate Research Fellowship, ³Eli Lilly/WCC Travel Award, ⁴Eugene Cota-Robles Fellowship, ⁵GAANN Chemistry Graduate Fellowship, ⁶Graduate Student Award for the 2010 Lindau Meeting of Nobel Laureates and Students, ⁷ARCS Scholarship, ⁸R. Bryan Miller Symposium Poster Award, ⁹McNair Scholar, ¹⁰NIH-NIGMS T32 Training Grant Fellowship, ¹¹Outstanding Teaching Assistant Award, ¹²Institute for Innovation and Entrepreneurship Fellowship, ¹³Radicle Growth Innovation Institute of Food & Health Fellow

GSoC mentoring program (2014-15, 2022-23): Josephine Fong (PhD/MSc, LAWR), William Turner IV (MS/PhD, LAWR), Rishab Iyer (PhD, Chem), Chisom Dim (PhD, Chem)

Thesis/Dissertation committee membership (graduation date): Zach Brown (Chem, 2012), Osvaldo Gutierrez (Chem, 2012), Belem Avila (Chem, 2012), Jose Ibarra (Chem, 2013), Gorkem Gunbas (Chem, 2013), Ao Ji (Chem, 2013), Kelli Gottlieb (Chem, 2014), Alexi Morris (Ball-Jones) (Chem, 2014), Robin Cumming (BME, 2016), Amelia Manlove (Chem, 2017), Fei Chang (Chem, 2018), Matthew Paddock (BAE, 2019), Amelia Arnold (Chem, 2020)

Undergraduate Student Researchers at UCD (62): Toby Chang (2007-09), Jennifer Etcheson (2007-09), David Lam (2008-09), Aziza Sahin (2007-09), Gary Arevalo (McNair Scholar, 2009-11), Casey Wong (2009-11), Karamjeet Sheikho (2010-11), Abel Silva (2009-2012), Sarah Tang (2010-2012), Sabrina Zenad (2010-12), Thuy Trang Nguyen (2011-12), Brent Hiramoto (2011-12), Jordan Boothe (2011-12), Catharine Pham (2011-12), Jack Taylor (2012), Zeeniya Yahiya (2012), Kate Gibson (2012-13), Lisa Gong (2012-13), Emily Allen (Summer 2012, NSF REU), Tuong Pham (2012), Kristen Darnell (Summer 2013, NSF REU), Richard Wood (2013-2014), Alex Schramm (2013-2014), Barbara Murta (2014), Hailey Hibbard (2014-2015), Chinmay Bhatt (2014-2015), Haley Cynar (2014-2015), Andres Calvillo (2014-2015), Raleigh Lukas (Summer 2015), Henry Effarah (Beckman Scholar, 2014-2016), Holly Vickery (2015-2016), Justin Lee (2015-), Blanca Gomez (McNair Scholar, 2015-2017), Alayna Nguyen (2015-2017), **Ben Wigman*** (NSF GRF, 2015-2017), Madison Frame (Summer 2016, NSF REU), Diane Ndepow (FLCC-UCD intern, Summer 2016, NSF REU), Mikayla Tan (Summer 2017, NSF REU), Chad Thomas (Summer 2017, NSF REU), Noreen Brar (2016-2018), Alma Perez (NSF CAMP Scholar, 2017-2018), Jeanelle Smoot (UHP, 2017-2018), Manuel Larach (2017-2018), **Karina Targos*** (FLCC-UCD intern, Beckman Scholar, NSF GRF, 2017-2019), Shaoming Sun (visiting scholar, Fall 2018), Emma Tribble (2018-2019), Adon Kwong (UHP, 2018-2019), Rene Martinez Reyes (FLCC-UCD intern, Summer 2018), Nadia Hirbawi (Summer 2018, NSF REU), Mira Milic (2018-), Teresa Tang (2019-), Serena Kutney (2019-), Jessica Reznier (2019), Madison Thompson (FLCC-UCD intern, 2019-), Jonah Brown (Summer 2019, HBCU CCB-GAP), Magda Tellez (2019-2021), Qian Ye (2019-2021), Mahsa Safi (2019-2021), Emmanuel Lanuza (2020-2021), Sarai Jaime (2019-2022), Maria Jazmin Abadam (2021-), Liam Wong (2022-)

**mentees awarded NSF Graduate Research Fellowships*

High School Students (UCD Young Scholars Program and ACS Project SEED): Skye Kelty (YSP, 2009), Kate Gibson (YSP, 2010), Jack Taylor (YSP, 2010), Kayla Ostiller (YSP, 2011), Andres Rosales (ACS SEED, 2011 and 2012), Gregory Martin (YSP, 2016)

Publications

(62) Barzee, T. J., El-Mashad, H., Burch, A. R., Franz A.K., Zhang, R.,* Fungal-Assisted Harvesting of Heat-Deactivated Diatom *Phaeodactylum tricornutum* and its Immobilization Kinetics, 2022, *submitted*.

- (61) Ball-Jones, N. R.; Cobo, A. A.; Armstrong, B. M.; Wigman, B.; Fettinger, J. C.; Hein, J. E.; Franz, A. K.* Ligand-Accelerated Catalysis in Scandium(III)-Catalyzed Asymmetric Spiroannulation Reactions, *ACS Catalysis*, **2022**, *12*, 3524–3533. **DOI:** 10.1021/acscatal.1c05768
- (60) Rude, K.; Yothers, C.; Barzee, T. J.; Kutney, S.; Zhang, R.; Franz, A.K.* Growth potential of microalgae on ammonia-rich anaerobic digester effluent for wastewater remediation, *Algal Research*, **2022**, online. **DOI:** 10.1016/j.algal.2021.102613
- (59) Jagannathan, J. R.; Targos, K.; Franz, A. K.* Synthesis of Functionalized Silsesquioxane Nanomaterials by Rhodium-catalyzed Carbene Insertion into Si–H bonds, *Angew. Chem. Int. Ed.* **2021**, *60*, 1–6. **DOI:** 10.1002/anie.202110417
- (58) Burch, A. R.; Yothers, C.; Salemi, M.; Phinney, B.; Pandey, P.; Franz, A. K.* Quantitative label-free proteomics and biochemical analysis of *Phaeodactylum tricornutum* cultivation on dairy manure wastewater, *J Appl Phycol.* **2021**, *33*, 2105–2121. **DOI:** 10.1007/s10811-021-02483-3
- (57) Mira, M.; Targos, K.; Thompson, M.; Tellez Chavez, M.; Jennings, J. J.; Franz, A. K.* NMR Quantification of H-Bond Accepting Ability for Organic Molecules, *J. Org. Chem.*, **2021**, *86*, 6031-6043. **DOI:** 10.1021/acs.joc.0c02876
♦ Selected as Feature Article and for Cover Art
- (56) Chang, Y. P.; Tang, T.; Jagannathan, J. R.; Hirbawi, N.; Sun, S.; Brown, J.; Franz, A. K.* NMR Quantification of Halogen-Bonding Ability to Evaluate Catalyst Activity *Org. Lett.* **2020**, *16*, 6647-6652. **DOI:** 10.1021/acs.orglett.0c02427
- (55) Jennings, J. J.; Mira, M.; Targos, K.; Franz, A. K.* NMR Quantification of H-Bond Donating Ability for Medicinal Functional Groups and Isosteres, *Eur. J. Med. Chem.*, **2020**, *207*, 112693. **DOI:** 10.1016/j.ejmech.2020.112693
- (54) Jagannathan, J. R.; Fettinger, J. C.; Shaw, J. T.*; Franz, A. K.* Enantioselective Si–H Insertion Reactions of Donor/Donor Carbenes for the Synthesis of Silicon-Stereogenic Silanes, *J. Am. Chem. Soc.*, **2020**, *147*, 11674-11679. **DOI:** 10.1021/jacs.0c04533
♦ Highlighted in *SYNFACTS* **2020**, *16(9)*, 1066. **DOI:** 10.1055/s-0040-1706852
- (53) Cobo, A.; Armstrong, B. A.; Fettinger, J. C.; Franz, A. K.* Catalytic Asymmetric Synthesis of Cyclopentene-spiroindoles Bearing Vinylsilanes Capable of Further Transformations, *Org. Lett.*, **2019**, *21*, 8196-8200. **DOI:** 10.1021/acs.orglett.9b02852
- (52) Jennings, J. J.; Wigman, B. W.; Armstrong, B. A.; Franz, A. K.* NMR Quantification of the Effects of Ligands and Counterions on Lewis Acid Catalysis, *J. Org. Chem.*, **2019**, *24*, 15845-15853. **DOI:** 10.1021/acs.joc.9b02107
- (51) Jagannathan, J. R.; Diemoz, K. M.; Targos, K.; Fettinger, J. C.; Franz, A. K.* Kinetic and Binding Studies of Silsesquioxane Silanols for Cooperative Hydrogen-bonding Catalysis and as a Silica Surface Model, *Chemistry - Eur. J.*, **2019**, *25*, 14953-14958. **DOI:** 10.1002/chem.201903693
- (50) Mesa, K.; Hibbard, H.; Franz, A. K.* Sodium-catalyzed Friedel-Crafts Reactions and Mechanistic Insight, *Org. Lett.*, **2019**, *11*, 3877-3881. **DOI:** 10.1021/acs.orglett.9b00747
- (49) Austin, K. T.; Franz, A. K.* Metal-free Synthesis of 1,3-Disiloxanediols and Aryl Siloxanols, *ACS Omega*, **2019**, *4*, 6295-6300. **DOI:** 10.1021/acsomega.9b00121
- (48) Diemoz, K. M.; Franz, A. K.* NMR Quantification of Hydrogen-Bond-Activating Effects for Organocatalysts including Boronic Acids, *J. Org. Chem.*, **2019**, *84*, 1126-1138. **DOI:** 10.1021/acs.joc.8b02389
♦ Selected as Feature Article and for Cover Art
- (47) Armstrong, B. A.; Sayler, R. I.; Shupe, B. H.; Stich, T. A.; Britt, R. D.; Franz, A. K.* EPR Evidence for the Origin of Nonlinear Effects in an Enantioselective Cu(II)-Catalyzed Spiroannulation, *ACS Catalysis*, **2019**, *9*, 1224-1230. **DOI:** 10.1021/acscatal.8b03822

- (46) Rude, K. M.; Barzee T. J.; Franz, A.K.* "Producing Oleaginous Microorganisms Using Wastewater: Methods and Guidelines for Lab- and Industrial-Scale Production" in *Methods Molecular Biology, Vol. 1995: Microbial Lipid Production*, (Springer; Ed. V. Balan) 327-355.
- (45) Franz, A. K.*; Yothers, C. "Conversion of Microbial Lipids to Biodiesel and Basic Lab Tests for Analysis of Fuel-Quality Parameters" in *Methods Molecular Biology, Vol. 1995: Microbial Lipid Production*. (Springer; Ed. V. Balan) 285-310.
- (44) Diemoz, K. M.; Wilson, S. O.; Hein, J.; Franz, A. K.* Reaction Progress Kinetics Analysis of 1,3-Disiloxanediols as Hydrogen-bonding Catalysts, *J. Org. Chem.*, **2017**, *82*, 6738-6747.
DOI: 10.1021/acs.joc.7b00875
- (43) Diemoz, K. M.; Wilson, S. O.; Franz, A. K.* Synthesis of Structurally Varied 1,3-Disiloxanediols and Activity as Anion-binding Catalysts, *Chemistry - Eur. J.*, **2016**, *22*, 18349-18353. **DOI:** 10.1002/chem.201604103
◆ *Selected as a HOT PAPER*
- (42) Burch, A. R.; Franz, A. K.* Combined Nitrogen Limitation and Hydrogen Peroxide Treatment Enhance Neutral Lipid Accumulation in Marine Diatom *Phaeodactylum tricorutum*, *Bioresource Technology*, **2016**, *219*, 559-565. **DOI:** 10.1016/j.biortech.2016.08.010
- (41) Jennings, J. J.; Bhatt, C.; Franz, A. K.* Lanthanum(III)-catalyzed three-component reaction of coumarin-3-carboxylates for the synthesis of fluorescent indolylmalonamides, *J. Org. Chem.*, **2016**, *81*, 6211-6222.
DOI: 10.1021/acs.joc.6b00541
- (40) Shi, J.; Pandey, P. K.*; Franz, A. K.; Deng, H.; Jeannotte, R. *Chlorella vulgaris* production enhancement with supplementation of synthetic medium in dairy manure wastewater, *AMB Expr.* **2016**, *6*, 15-23.
DOI: 10.1186/s13568-016-0184-1
- (39) Badillo, J. J.; Ribeiro, C. J. A.; Olmstead, M. A.; Franz, A. K.* Titanium(IV)-Catalyzed Stereoselective Synthesis of Spirooxindole-1-pyrrolines, *Org. Lett.*, **2014**, *16*, 6270-6273. **DOI:** 10.1021/ol5028128
- (38) Bjornson, M.; Benn, G.; Song, X.; Comai, L.; Franz, K.; Drakakaki, G.; Dehesh, K.* Distinct roles for MAPK signaling and CAMTA3 in regulating the peak time and amplitude of the plant general stress response, *Plant Physiol.* **2014**, *166*, 988-996. **DOI:** 10.1104/pp.114.245944.
- (37) Wong, D. M.; Nguyen, T. T.; Franz, A. K.* Ethylenediaminetetraacetic acid (EDTA) enhances intracellular lipid staining with Nile red in microalgae *Tetraselmis suecica*, *Algal Research*, **2014**, *5*, 158-163.
DOI:10.1016/j.algal.2014.08.002
- (36) Ball-Jones, N. R.; Badillo, J. J.; Tran, N. T.; Franz, A. K.* Catalytic Enantioselective Carboannulation with Allylsilanes, *Angew. Chem., Int. Ed. Engl.* **2014**, *35*, 9462-9465. **DOI:** 10.1002/anie.201403607
- (35) Tran, N. T.; Wilson, S. O.; Franz, A. K.* Supramolecular Hydrogen-bonding Assembly of Silanediols with Bifunctional Heterocycles. *Chem. Commun.* **2014**, *50*, 3738-3740. **DOI:**10.1039/C4CC00672K
- (34) MacDonald, J. P.; Shupe, B. H.; Schreiber, J. D.; Franz, A. K.* Counterion Effects in the Catalytic Stereoselective Synthesis of 2,3'-Pyrrolidinyl Spirooxindoles. *Chem. Commun.* **2014**, *50*, 5242-5244.
DOI: 10.1039/C3CC47767C
- (33) Wedler, H.*; Boyes, L.; Davis, R.; Flynn, D.; Franz, A.; Hamann, C.; Harrison, J.; Lodewyk, M.; Milinkevich, K.; Shaw, J.; Tantillo, D.; Wang, S. Nobody Can See Atoms: Science Camps Highlighting Approaches for Making Chemistry Accessible to Blind and Visually-Impaired Students, *J. Chem. Educ.*, **2014**, *91*, 188-194. **DOI:** 10.1021/ed300600p
- (32) Franz, A. K., Gutierrez, E. G.: Oxindole; Isatin; 1H-Indole-2,3-dione, *Encyclopedia of Reagents for Organic Synthesis.*, Wiley.
- (31) Wong, D. M.; Franz, A. K.* A Comparison of Lipid Storage in *Phaeodactylum Tricorutum* and *Tetraselmis Suecica* Using Laser Scanning Confocal Microscopy, *J. Microbiol. Meth.*, **2013**, *95*, 122-128.
DOI: 10.1016/j.mimet.2013.07.026

- (30) Shupe, B. H.; Allen, E.; MacDonald, J. P.; Wilson, S. O.; Franz, A. K.* Synthesis of Spirocarbamate Oxindoles via Intramolecular Trapping of a β -Silyl Carbocation by an *N*-Boc group, *Org. Lett.* **2013**, *15*, 3218-3221. DOI: 10.1021/ol4010867
- (29) Franz, A. K.*; Danielewicz, M. A.; Wong, D. M.; Anderson, L. A.; Boothe, J. R. Phenotypic Screening with Oleaginous Microalgae Reveals Modulators of Lipid Productivity, *ACS Chem. Biol.* **2013**, *8*, 1053-1062. DOI: 10.1021/cb300573r
- (28) Franz, A. K.*; Hanhan, N. V.; Ball-Jones, N. R. Asymmetric Catalysis for the Synthesis of Spirocyclic Compounds (invited review). *ACS Catalysis*, **2013**, *3*, 540-553.
- (27) Wilson, S. O.; Franz, A. K.* Organosilicon Molecules with Medicinal Applications (invited review), *J. Med. Chem.*, **2013**, *56*, 388-405. DOI: 10.1021/jm3010114
- (26) Wilson, S. O.; Tran, N. T.; Franz, A. K.* Synthesis and Intramolecular Hydrogen Bonding of Amide-containing Silanediols, *Organometallics*, **2012**, *31*, 6715-6718. DOI: 10.1021/om300736n
- (25) Sitepu, I.R.*; Ignatia, L.; Franz, A.K.; Wong, D.; Faulina, S.A.; Tsui, M.; Boundy-Mills, K. An Improved High Throughput Nile Red Fluorescence Assay for Estimating Intracellular Lipids in a Variety of Yeast Species, *J. Microbiol. Meth.*, **2012**, *91*, 321-328. DOI: 10.1016/j.mimet.2012.09.001
- (24) Hanhan, N. V.; Tang, Y. C.; Tran, N. T.; Franz, A. K.* Scandium(III)-catalyzed Enantioselective Allylation of Isatins Using Allylsilanes, *Org. Lett.* **2012**, *14*, 285-293. DOI: 10.1021/ol300496v
- (23) Min, T.; Fettinger, J. C.; Franz, A. K.* Enantiocontrol with a Hydrogen-bond Directing Pyrrolidinylsilanol Catalyst. *ACS Catalysis*. **2012**, *2*, 1661-1666. DOI: 10.1021/cs300290j
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- †(4) Driver, T. G.; Franz, A. K.; Woerpel, K. A.* Diastereoselective Silacyclopropanations of Functionalized Chiral Alkenes. *J. Am. Chem. Soc.* **2002**, *124*, 6524-6525. DOI: 10.1021/ja020183k
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- (2) Franz, A. K.; Woerpel, K. A.* Development of Reactions of Silacyclopropanes as New Methods for Stereoselective Organic Synthesis. *Acc. Chem. Res.* **2000**, *33*, 813-820. DOI: 10.1021/ar9900562
- (1) Franz, A. K.; Woerpel, K. A.* Stereospecific and Regioselective Reactions of Silacyclopropanes with Carbonyl Compounds Catalyzed by Copper Salts: Evidence for a Transmetalation Mechanism. *J. Am. Chem. Soc.* **1999**, *121*, 949-957. DOI: 10.1021/ja982897u

† Authors are listed alphabetically

Patents

“Methods for Altering Lipid Levels and Lipid Composition in Algae and Yeast”

Annaliese K. Franz, Megan A. Danielewicz, Diana M. Wong, Lisa A. Anderson, U.S. patent 8,778,643.

Invited Research Talks

- 63) 51st Silicon Symposium, San Diego, CA, March 2022
- 62) Silicon Containing Polymers and Composites 2021, San Diego, CA, December 2021
- 61) Department of Chemistry, UC Santa Barbara, October 2021
- 60) Department of Chemistry, Michigan State University, October 2021
- 59) 50th Silicon Symposium, Columbia, SC, May 2019
- 58) 13th International Symposium on Macrocyclic and Supramolecular Chemistry, Quebec City, July 2018
- 57) 10+10 Alliance, Global Frontiers in Chemistry and Chemical Biology, Peking University, May 2018
- 56) Department of Chemistry, Texas Tech University, TX February 2018
- 55) Department of Chemistry, Sacramento City College, CA January 2018
- 54) 48th Silicon Symposium, Philadelphia, PA, June 2017
- 53) Huazhong Agricultural University, Wuhan, Hubei, China, April 2017

- 52) Wuhan University, Wuhan, Hubei, China, April 2017
- 51) Central China Normal University, Wuhan, China, April 2017
- 50) Silicon Containing Polymers and Composites 2016, San Diego, CA, December 2016
- 49) 47th Silicon Symposium, Portland, OR, June 2016
- 48) 3rd US-Spain Workshop on Asymmetric Synthesis and Catalysis, Bilbao, Spain, May 2016
- 47) Department of Plant Sciences, University of California, Davis, CA, April 2016
- 46) 10+10 Alliance, Symposium on Sustainable Chemistry, UC Davis, May 2016
- 45) Enabling Technology for Reactions and Processes, Telluride Science Research Center, July 2015
- 44) Department of Chemistry, University of South Carolina, Columbia, SC, March 2015
- 43) Department of Chemistry, University of California, Santa Cruz, CA, March 2015
- 42) Symposium on International Collaboration between NAIST and UC Davis, February 2015
- 41) Mechanism in the Mountains Symposium, Yosemite, CA, January 2015
- 40) 17th International Symposium on Silicon Chemistry, ISOS XVII, Berlin, August 2014
- 39) Natural Products Gordon Research Conference, Andover, NH, July 2014
- 38) Pontificia Universidad Católica, Santiago, Chile, July 2014
- 37) Department of Chemistry, Emory University, April 2014
- 36) Department of Chemistry, Santa Clara University, January 2014
- 35) Department of Chemistry, University of California, Berkeley, CA, November 2013
- 34) Department of Chemistry, University of Missouri, Columbia, September 2013
- 33) DOE-BES Catalysis Contractors Meeting: Frontiers at the Interface of Homogeneous and Heterogeneous Catalysis, Meeting of the Catalysis Science Program, Office of Basic Energy Sciences, U.S. Dept. of Energy, Annapolis, MD, July 2013
- 32) UC Davis Biofuels Symposium, University of California, Davis, CA, May 2013
- 31) 245th ACS National Meeting, Symposium, New Orleans, LA, March 2013
- 30) Department of Chemistry, Colorado State University, CO, March 2013
- 29) Department of Chemistry, University of Texas, Austin, TX, October 2012
- 28) American Chemical Society, DOC Young Academic Investigators Symposium, August 2012
- 27) Department of Chemistry, UC Irvine, CA, October 2012
- 26) 4th EuCheMS Young Investigator Workshop, Vienna, Austria, August 2012
- 25) 44th Silicon Symposium, Brock University, Ontario, Canada, June 2012
- 24) Department of Chemistry, University of California, Riverside, CA, May 2012
- 23) Department of Chemistry, University of California, Los Angeles, CA, May 2012
- 22) Department of Chemistry and Biochemistry, University of California, San Diego, CA, May 2012
- 21) Department of Chemistry, University of California, Santa Cruz, CA, May 2012
- 20) Department of Chemistry, University of Maryland, College Park, MD, April 2012
- 19) Department of Chemistry, Boston University, Boston, MA, April 2012
- 18) Department of Chemistry, University of Kansas, Lawrence, KS, April 2012
- 17) Department of Chemistry, University of Arkansas, April 2012
- 16) 243rd ACS National Meeting, WCC Rising Star Awards Symposium, San Diego, CA, March 2012
- 15) Department of Chemistry, University of Delaware, DE, March 2012
- 14) Department of Chemistry, University of Utah, Salt Lake City, UT, April 2012
- 13) 242nd ACS National Meeting, Denver, CO, August 2011
- 12) Department of Chemistry and Biochemistry, Trinity University, San Antonio, TX, February 2011
- 11) R. Bryan Miller Symposium, University of California, Davis, CA, March 2011

- 10) Bilateral Conference of UC Davis and Academia Sinica, Taipei, Taiwan, December 2010
- 9) Department of Chemistry and Biochemistry, Sonoma State University, October 2010
- 8) Heterocyclic Compounds GRC, Salve Regina University, Newport, RI, June 2010
- 7) Department of Chemistry, CSU-Sacramento, March 2010
- 6) Department of Chemistry, University of the Pacific, Stockton, CA, October 2009
- 5) Combinatorial Chemistry GRC, Colby-Sawyer College in New London, NH, June 2009
- 4) 2nd TUS International Collaboration Workshop, Tokyo University of Science, December 2008
- 3) Department of Chemistry and Biochemistry, CSU Los Angeles, November 2008
- 2) NSF Physical Organic Chemistry Workshop, Tahoe, CA September 2008
- 1) Accelerated Bio and Chem (ABC) Technologies, Basel, Switzerland, January 2006

Invited Talks/Presentations/Interviews/Media for Public & Non-Scientists

- 11) Making Molecules, Materials and Medicines. *Science Distilled*, January 18, 2017. Science Café hosted by Bobby Costagna, Sacramento, CA
- 10) Go Team! Mentoring for Success in Writing, Presenting, and Professional Development, Mentoring Critical Transitions Program, UC Davis, April 26, 2016
- 9) Molecular Green Machines: Sustainable Fuels from Algae, *Science Night Live*, August 5, 2015. Science Café hosted by Nick Grey at the World of Wonders Science Museum in Lodi, CA
- 8) "Sustainable Fuels From Algae" Radio Interview on "Insight", a radio show on Capitol Public Radio (NPR), August 5, 2015, broadcast from Sacramento, CA. [http:// www.capradio.org/53819](http://www.capradio.org/53819) .
- 7) Writing to Learn in STEM, AAC&U Conference, Transforming STEM Education: Inquiry, Innovation, Inclusion, and Evidence, November 1, 2013, San Diego, CA
- 6) Can Oil from Algae Power your Car? *Davis Science Café* hosted by Jared Shaw, Davis, CA. May 1, 2013
- 5) Sunday/Funday: Tea, Earth Day, Artichokes, Science of Cooking, Other, April 15, 2013, Interview of A. K. Franz about our research on Eat Drink Explore Radio.
- 4) From green glop to jet fuel, Website, April 15, 2013, Featuring our research in Progressive Charleston.
- 3) Yo, Algae: Take two and call me in the morning, Website, April 10, 2013, Featuring our research in Biofuels Digest
- 2) From Elements to Molecules: Molecular Architecture and the Chemistry of Life, California Science Teachers Association (CSTA) Conference, October 20, 2012, San Jose, CA
- 1) Chemistry Camp for the Blind, 2011-2016 (except 2015), founded by Dr. Henry Wedler (UCD Chemistry alumnus), hosted at Enchanted Hills, Napa, CA. <http://lighthouse-sf.org/blog/tag/chemistry-camp/>

Current Research Grants

Developing an Algae Ruminant Feed Additive to Reduce Methane Emissions

Science Translation and Innovative Research (STAIR) grant

Source of Support: Venture Capital, UC Davis Office of Research

Duration: 07/01/2020 to 09/31/22

\$50,000

Role: PI/Director

Enantioenriched Silanol and Siloxy Compounds as Catalysts and Ligands

Source of Support: National Science Foundation, Chemical Catalysis

Proposed Duration: 07/01/19 to 06/30/23

\$450,000

Role: PI

Current Education and Training Grants

Driving Change Initiative, Phase I

UC Davis Pre-proposal selected (38 of 99 advanced); invited to submit full proposal in 2022

Source of Support: Howard Hughes Medical Institute

Duration: 03/31/2021 to 06/30/23

\$60,000

Role: PI/Director

Louis Stokes STEM Pathways and Research Alliance: California Louis Stokes Alliance for Minority Participation

Source of Support: National Science Foundation

Duration: 07/01/18 to 06/30/23

\$300,000 to UCD (\$4M total)

Role: PI/Director for UC Davis (systemwide PI is Chancellor Kim Wilcox at UC Riverside)

REU Site: UC Davis ChemEnergy Research Experience for Undergraduates in Energy & Catalysis

Source of Support: National Science Foundation

Duration: 04/01/20 to 03/31/23

\$364,000

Role: co-PI (with Jesus Velazquez as PI)

MIDAS: Multidimensional Instructional Development for Achievement and Success

Source of Support: Howard Hughes Medical Institute

Duration: 06/1/2017 to 05/31/22

\$1,000,000

Role: Co-PI, core leadership team (Marc Faccioli, PI)

REU Site: UC Davis ChemEnergy Research Experience for Undergraduates in Energy & Catalysis

Source of Support: National Science Foundation

Duration: 07/01/16 to 06/30/21 (includes no-cost extension)

\$380,403

Role: PI (with co-PI: Jesus Velazquez)

Completed Research Support and Training Grants

Improving microalgae feedstock for biofuel production using CO₂ and waste nutrients from anaerobic digesters

Source of Support: California Energy Commission

Duration: 12/01/15-3/31/20

\$1,196,336 (includes UCD match)

Role: PI (with Co-PIs: Zhang, Kendall and VanderGheynst)

Chemical and Chemical Biology Graduate Admissions Pathways Program

Source of Support: UC Office of the President, HBCU Initiative Program

Duration: 12/01/2016 to 11/30/19

\$263,193 (not including PI salary)

Role: PI (2018-2020; Jared Shaw PI 2016-2018)

SusChEM: Characterization of oxidative stress response to improve microalgae-based biofuel production in wastewater

Source of Support: National Science Foundation, CBET

Duration: 08/01/15 to 07/31/19 (includes no cost extension)

\$309,867

Role: PI

Hypervalent Iodine-mediated Transformation of Silyl-substituted Hydrocarbons

Source of Support: American Chemical Society, Petroleum Research Fund

Duration: 07/01/16 to 06/31/19

\$110,000

Role: PI

SusChEM: Design and Mechanistic Studies of Organic Silanols for Homogeneous Catalysis

Source of Support: National Science Foundation, Chemical Catalysis

Duration: 08/01/14 to 07/31/17

\$467,880

Role: PI

Graduate Assistance in Areas of National Need (GAANN), Department of Chemistry Graduate Fellowship Program

Source of Support: U.S. Department of Education

Duration: 09/01/12 to 08/31/16

\$659,625

Role: PI (with Co-PI: Susan Kauzlarich)

Dissection of Polysaccharide Deposition and Assembly in Plant Cell Walls

Source of Support: National Science Foundation

Duration: 07/01/13 to 06/30/16

\$574,893 (total)

Role: Senior Personnel, PI: Georgia Drakakaki (UC Davis, Plant Sciences)

Development of Novel Drugs for Studying the Plant Endomembrane System

Source of Support: UC Davis Academic Senate Committee on Research

Duration: 07/01/14 to 09/30/15

\$22,837

Role: Senior Personnel, PI: Georgia Drakakaki (UC Davis, Plant Sciences)

CAREER: Synthesis and Study of Organic Silanols for Asymmetric Catalysis

Source of Support: National Science Foundation

Duration: 07/01/09 to 06/30/14

\$550,000

Role: PI

Complex Heterocycles and Hybrid Strategies for Pilot Scale Libraries

Source of Support: National Institutes of Health

Duration: 07/01/10 to 06/31/15 (includes no cost extension)

\$750,000 (total)

Role: Project Leader, PI: Mark Kurth

Design and Synthesis of Silicon-containing Peptidomimetics as Improved Cancer-targeting Agents

Source of Support: UC Cancer Research Coordinating Committee

Duration: 07/01/12 to 06/30/13

\$53,000

Role: PI

New Catalytic Asymmetric Reactions of Allylsilanes and Isatins

Source of Support: American Chemical Society-Petroleum Research Fund

Duration: 09/01/09 to 08/31/11

\$100,000

Role: PI

Chemical Genetics Modulation of Metabolic Pathways to Increase Biofuel Production from Microalgae

Source of Support: Chevron Technology Ventures

Duration: 01/01/09 to 12/31/12

\$551,170

Role: PI

3M Nontenured Faculty Award/Grant

Source of Support: 3M Community Affairs

Duration: 04/01/09 to 03/31/13

\$45,000

Role: PI

Graduate Assistance in Areas of National Need (GAANN), Department of Chemistry Graduate Fellowship Program

Source of Support: U.S. Department of Education

Duration: 08/15/09 to 09/14/12

\$489,000

Role: Co-PI (PI: Susan Kauzlarich), 2009-2011; PI from 2011-12