

Andreas H. Franz (Professor)

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1) Goals and Objectives

My primary scientific goal is to gain detailed insight into the role that carbohydrates and carbohydrate mimetics play in biological systems. I am interested in the synthesis and spectroscopic characterization of carbohydrate derivatives, post-translational modifications of proteins, and non-covalent host-guest complexes.

2) Qualifications

- 24 years of continuous university-level teaching (Organic chemistry I+II 2002-2025, Adv. Organic Chemistry 2003 + 2011, Instrumental Analysis 2004-2008, '18, '20, Adv. NMR-Spectroscopy 2004, '07, '09, '11, '13, '15, '17, '19, '21, '24 Organic chemistry workshops 2003-2018 – 10-25 leaders, ~200 students/semester)
- Supervisor for graduate/undergraduate research, development of suitable projects (synthetic/analytical carbohydrate chemistry).
- Strong instrumental background in analytical chemistry (incl. FT-NMR, MALDI-TOF/FT-ICR-MS, HPLC).
- Strong background in chemistry with major in synthetic organic chemistry (special topic: Carbohydrate mimetics).

3) Education/Positions

- Co-Chair of the department of chemistry (personnel + budget), UOP (fall 2011-2017)
- Director of Graduate Research (Chemistry) (spring 2011-2021)
- Professor UOP (spring 2013-present)
- Associate professor UOP (spring 2008-spring 2013)
- Assistant professor UOP (fall 2002-fall 2007)
- Postdoctoral fellow UC Davis (Fall 2000-2002): Synthetic modification and MALDI-FT-ICR mass spectrometric characterization of oligosaccharides.
- University of the Pacific (1997-2000) Stockton (CA, USA), Ph. D.
- University of the Pacific (1995-1997), Stockton (CA, USA), Master of Science (1997).
- Universität-Gesamthochschule Siegen (1992-1994), Siegen (Germany), Vordiplom (equivalent to B. S.).

4) Special Skills

1. Modern instrumentation (NMR, MALDI-TOF MS, HPLC, IR, UV-VIS)
2. Two-year experience with FT-ICR mass spectrometry
3. Broad solution-NMR knowledge (1D, 2D, VT, cryogen-refill).
4. ACS Short Course “Chromatography/Mass Spectrometry” (O. D. Sparkman, F. E. Klink), UOP summer 1999, spring 2000 (assistant).
5. ACS-PRF summer school “X-Ray Crystallography for Organic Chemists”, fall 2004 (Dr. Arnie Rheingold, UC San Diego).
6. ACS-PRF workshop “Physical Organic Chemistry”, summer 2005 (Dr. Jacky Gervay-Hague, UC Davis, Bodega Bay, CA).

5) Professional Activities

1. Manager of 600 MHz NMR-facility at Pacific (**fall 2008-present**)
2. Manager of MALDI-TOF mass spectrometer (**fall 2003-present**)
3. Served on Pacific Safety Committee (**spring 2012-2020**)
4. Sabbatical, Moscow State University, Russia (**spring 2010**)
5. Panel member National Science Foundation, Washington DC (**October 2007 + 2009**)
6. Editorial board of reviewers (ARKIVOC, online, **fall 2006-present**)
7. Ad hoc reviewer for *Carbohydr. Res.*, *J. Org. Chem.*, *J. Am. Soc. Mass Spectrom.*, *Devel. Comp. Immunol.*, *Anal. Chim. Acta*, *ChemMedchem*, *Synthesis* (**2007-present**).
8. Consulting/Analytical Services (EpiGenSys, **April 2018-2020**, VM Pharma, **February 2015-2017**, Prozyme, Inc. (now Agilent), **January 2005-2020**; Formurex, Inc., **August 2006-July 2007**, Shimadzu Biotech Corp., **January 2005-2008**)
9. Transfer student advising (Pacific, **spring 2006, summer 2006+07+08+10+11, fall 2007, summer 2011,'13**).
10. Freshmen student advising (Pacific, **summer 2009+11+12**)
11. Committee "Faculty compensation" (Pacific **2007-2009**)
12. Committee "Courses and Standards" (Pacific, **2004-2006**).
13. Committee "Pharmaceutical Sciences and Chemistry PSCP" (Pacific, **2007-present**)
14. Mentor (Annual ACS-SEED program for Stockton high school students, **2001-2006, 2008, 2016-19**).
15. Mentor/Consultant (National Institute for Drug Abuse, NIDA. Grant to UC Davis/Pacific School of Education, Community Outreach to High Schools – worked with Lula Abusalih + 2 students at West Tracy High School, topic: caffeine, **spring 2009-2011**)
16. Review of book "Understanding Mass Spectra – A Basic Approach", R. M. Smith, 2nd Ed., Wiley, 2004.
17. Organized/Chaired two symposia at the 39th Western Regional ACS Meeting, Sacramento, CA, October **2004**: "Carbohydrates – Synthesis, Characterization, and Biological Properties" and "Combinatorial Chemistry - Current Encoding Techniques and Medical Applications"
18. Evaluator Regional/NorCal Science Olympiad **1999** (High Schools 6th-12th grade).

6) Languages

English and German fluent, French (4 years), Latin (6 years).

7) Affiliation

1. Society for Glycobiology (**2006-present**)
2. Alpha-Chi-Sigma Chemistry Fraternity (**2002-present**)
3. American Society for Mass Spectrometry (**1999-present**)
4. American Chemical Society + Division of Carbohydrate Chemistry (**1996-present**)

8) Recognition

Faculty Research Award (UOP, fall 2013)
Chapter of ΦΚΦ (UOP)
"Who is Who", Spring **1998** (UOP)

9) Publications (total: **65**, listed in Chem. Abstr.**59**)

1. Franz, A.H., Ta, N., Nguyen, E. et al. *Anal. Sci.* 41, 297–310 (2025).
<https://doi.org/10.1007/s44211-024-00700-w>.

2. Andreas H. Franz, Kendall S. Bromley, Ei T. Aung, Stephen Q. L. Do, Hana M. Rosenblatt, Amelia J. Watson, Magn. Reson. Chem., 2024 <https://doi.org/10.1002/mrc.5483>.
3. A. Parkins; A. V. R. Pilien; A. M. Wolff; C. Argueta; J. Vargas; S. Sadeghi; A. H. Franz; M. C. Thompson; G. Pantouris, J. Med. Chem. 2024, 67 (9), 7359-7372 <https://doi.org/10.1021/acs.jmedchem.4c00177>.
4. A. H. Franz; N. M. Samoshina; V. V. Samoshin, Chem. Phys. Lipids 2024, 261, 105395 <https://doi.org/10.1016/j.chemphyslip.2024.105395>.
5. K. M. Christison; G. B. Boursalian; A. H. Franz, Fuel 2024, 358 (Part_B), 130343 <https://doi.org/10.1016/j.fuel.2023.130343>.
6. A. Parkins; S. I. Sandin; J. Knittel; A. H. Franz; J. Ren; E. de Alba; G. Pantouris, Anal. Chem. (Washington, DC, U. S.) 2023, 95 (11), 4957-4965 <https://doi.org/10.1021/acs.analchem.2c04969>.
7. B. Irshad; C. Lu; A. E. Nderstigt; P. Hu; L. Xue; J. Lin-Cereghino; A. H. Franz; J. S. Harrison; G. P. Lin-Cereghino, Protein Expression Purif. 2023, 212, 106355 <https://doi.org/10.1016/j.pep.2023.106355>.
8. A. Watson; C. Simmermaker; E. Aung; S. Do; S. Hackbusch; A. H. Franz, Carbohydr. Res. 2021, 503, 108296 <https://doi.org/10.1016/j.carres.2021.108296>.
9. A. Watson; S. Hackbusch; A. H. Franz, Carbohydr. Res. 2019, 473, 18-35 <https://doi.org/10.1016/j.carres.2018.12.012>.
10. C. A. Naranjo; A. D. Jivan; M. N. Vo; K. H. de Sa Campos; J. S. Deyarmin; R. M. Hekman; C. Uribe; A. Hang; K. Her; M. M. Fong; J. J. Choi; C. Chou; T. R. Rabara; G. Myers; P. Moua; D. Thor; D. D. Risser; C. A. Vierra; A. H. Franz; J. Lin-Cereghino; G. P. Lin-Cereghino, Appl. Environ. Microbiol. 2019, 85 (24), e01615 <https://doi.org/10.1128/aem.01615-19>.
11. Y. Zheng; X. Liu; N. M. Samoshina; V. V. Samoshin; A. H. Franz; X. Guo, Chem. Phys. Lipids 2018, 210, 129-141 <https://doi.org/10.1016/j.chemphyslip.2017.10.004>.
12. Y. S. Wong; B. Brazdova; S. Koo; A. V. Samoshin; A. H. Franz; V. V. Samoshin, J. Undergrad. Chem. Res. 2018, 17 (4), 117-120.
13. A. Watson; C. Wallis; A. H. Franz, ARKIVOC (Gainesville, FL, U. S.) 2018, (3), 279-301 <https://doi.org/10.24820/ark.5550190.p010.340>.
14. S. Hackbusch; A. Watson; A. H. Franz, Carbohydr. Res. 2018, 458-459, 1-12 <https://doi.org/10.1016/j.carres.2018.01.005>.
15. S. Hackbusch; A. Watson; A. H. Franz, ARKIVOC (Gainesville, FL, U. S.) 2017, (5), 268-293 <https://doi.org/10.24820/ark.5550190.p010.113>.
16. P. S. Moua; A. Gonzalez; K. T. Oshiro; V. Tam; Z. H. Li; J. Chang; W. Leung; A. Yon; D. Thor; S. Venkatram; A. H. Franz; D. D. Risser; J. Lin-Cereghino; G. P. Lin-Cereghino, Protein Expression Purif. 2016, 124, 1-9 <https://doi.org/10.1016/j.pep.2016.04.005>.
17. S. Hackbusch; A. H. Franz, Tetrahedron Lett. 2016, 57 (26), 2873-2876 <https://doi.org/10.1016/j.tetlet.2016.05.066>.
18. A. H. Franz; G. Gudial; I. Serebnitskaya, J. Undergrad. Chem. Res. 2016, 15 (2), 25-35.
19. Y. Zheng; X. Liu; N. M. Samoshina; V. V. Samoshin; A. H. Franz; X. Guo, Biochim. Biophys. Acta, Biomembr. 2015, 1848 (12), 3113-3125 <https://doi.org/10.1016/j.bbamem.2015.08.021>.
20. A. Pardo; T. J. Hogenauer; Z. Cai; J. A. Vellucci; E. M. Castillo; C. W. Dirk; A. H. Franz; K. Michael, ChemBioChem 2015, 16 (13), 1884-1889 <https://doi.org/10.1002/cbic.201500266>.
21. S. Hackbusch; A. H. Franz, ARKIVOC (Gainesville, FL, U. S.) 2015, (7), 172-194 <https://doi.org/10.3998/ark.5550190.p009.321>.

22. A. V. Samoshin; I. A. Dotsenko; N. M. Samoshina; A. H. Franz; V. V. Samoshin, *Int. J. Carbohydr. Chem.* 2014, 941059/1 <https://doi.org/10.1155/2014/941059>.
23. A. H. Franz; A. Watson; S. Hackbusch; V. V. Samoshin, *J. Undergrad. Chem. Res.* 2014, 13 (2), 29-33.
24. A. H. Franz; I. Serebnitskaya; G. Gudial; C. Wallis, *ARKIVOC* (Gainesville, FL, U. S.) 2014, (5), 94 <https://doi.org/10.3998/ark.5550190.p008.583>.
25. I. A. Dotsenko; Q. Zhao; A. H. Franz; P. Batoon; N. M. Samoshina; V. V. Samoshin, *ARKIVOC* (Gainesville, FL, U. S.) 2014, (5), 16 <https://doi.org/10.3998/ark.5550190.p008.671>.
26. Y. Zheng; X. Liu; N. M. Samoshina; V. A. Chertkov; A. H. Franz; X. Guo; V. V. Samoshin, *Nat. Prod. Commun.* 2012, 7 (3), 353-358 <https://doi.org/10.1177/1934578x1200700317>.
27. C. A. Staley; A. Huang; M. Nattestad; K. T. Oshiro; L. E. Ray; T. Mulye; Z. H. Li; T. Le; J. J. Stephens; S. R. Gomez; A. D. Moy; J. C. Nguyen; A. H. Franz; J. Lin-Cereghino; G. P. Lin-Cereghino, *Gene* 2012, 496 (2), 118-127 <https://doi.org/10.1016/j.gene.2012.01.006>.
28. A. V. Samoshin; J. Visser; M. Curtis; V. V. Samoshin; A. H. Franz, *ARKIVOC* (Gainesville, FL, U. S.) 2012, (8), 27-35 <https://doi.org/10.3998/ark.5550190.0013.803>.
29. X. Liu; Y. Zheng; N. M. Samoshina; A. H. Franz; X. Guo; V. V. Samoshin, *J. Liposome Res.* 2012, 22 (4), 319-328 <https://doi.org/10.3109/08982104.2012.698420>.
30. A. H. Franz; P. H. Gross; K. Michael, *Carbohydr. Chem.: Proven Synth. Methods* 2012, 1, 159-166.
31. N. M. Samoshina; X. Liu; B. Brazdova; A. H. Franz; V. V. Samoshin; X. Guo, *Pharmaceutics* 2011, 3, 379-405 <https://doi.org/10.3390/pharmaceutics3030379>.
32. W. Liu; M. A. Minier; A. H. Franz; M. Curtis; L. Xue, *Supramol. Chem.* 2011, 23 (12), 806-818 <https://doi.org/10.1080/10610278.2011.632824>.
33. W. Liu; E. Navarro; A. H. Franz; L. Xue, *Synth. Commun.* 2010, 40 (8), 1192-1201 <https://doi.org/10.1080/00397910903061050>.
34. Z. Li; A. Moy; S. R. Gomez; A. H. Franz; J. Lin-Cereghino; G. P. Lin-Cereghino, *Biochem. Biophys. Res. Commun.* 2010, 402 (3), 519-524 <https://doi.org/10.1016/j.bbrc.2010.10.067>.
35. Z. Li; W. Leung; A. Yon; J. Nguyen; V. C. Perez; J. Vu; W. Giang; L. T. Luong; T. Phan; K. A. Salazar; S. R. Gomez; C. Au; F. Xiang; D. W. Thomas; A. H. Franz; J. Lin-Cereghino; G. P. Lin-Cereghino, *Protein Expression Purif.* 2010, 72 (1), 113-124 <https://doi.org/10.1016/j.pep.2010.03.004>.
36. L. Zhao; R. T. Almaraz; F. Xiang; J. L. Hedrick; A. H. Franz, *J. Am. Soc. Mass Spectrom.* 2009, 20 (9), 1603-1616 <https://doi.org/10.1016/j.jasms.2009.04.021>.
37. Z. Li; A. Moy; K. Sohal; C. Dam; P. Kuo; J. Whittaker; M. Whittaker; N. Duezguenes; K. Konopka; A. H. Franz; J. Lin-Cereghino; G. P. Lin-Cereghino, *Protein Expression Purif.* 2009, 67 (2), 175-181 <https://doi.org/10.1016/j.pep.2009.06.001>.
38. H. Yu; K. Murata; J. L. Hedrick; R. T. Almaraz; F. Xiang; A. H. Franz, *Arch. Biochem. Biophys.* 2008, 479 (2), 179 <https://doi.org/10.1016/j.abb.2008.08.017>.
39. A. H. Franz; P. H. Gross; V. V. Samoshin, *ARKIVOC* (Gainesville, FL, U. S.) 2008, (1), 232-308.
40. N. S. Chindarkar; A. H. Franz, *ARKIVOC* (Gainesville, FL, U. S.) 2008, (15), 21-33 <https://doi.org/10.3998/ark.5550190.0009.f03>.
41. H. Yu; K. Murata; J. L. Hedrick; R. T. Almaraz; F. Xiang; A. H. Franz, *Arch. Biochem. Biophys.* 2007, 463 (1), 1-11 <https://doi.org/10.1016/j.abb.2007.02.002>.
42. Y. S. Wong; B. Brazdova; S. Koo; A. V. Samoshin; A. H. Franz; V. V. Samoshin, *J. Undergrad. Chem. Res.* 2007, 6 (2), 81-85.

43. K. Takata; C. Hirata-Fukae; A. G. Becker; S. Chishiro; A. J. Gray; K. Nishitomi; A. H. Franz; G. Sakaguchi; A. Kato; M. P. Mattson; F. M. Laferla; P. S. Aisen; Y. Kitamura; Y. Matsuoka, *Eur J Neurosci* 2007, 26 (9), 2458-2468 <https://doi.org/10.1111/j.1460-9568.2007.05852.x>.
44. Q. L. Nguyen; L. Olmstead; S. Bains; A. H. Franz, *ARKIVOC* (Gainesville, FL, U. S.) 2007, (13), 235-251 <https://doi.org/10.3998/ark.5550190.0008.d27>.
45. O. Goltvyanitsa; N. Chindarkar; A. H. Franz, *J. Undergrad. Chem. Res.* 2007, 6 (3), 103-107.
46. T. M. K. Chiu; K. Sigillo; P. H. Gross; A. H. Franz, *Synth. Commun.* 2007, 37 (14), 2355-2381 <https://doi.org/10.1080/00397910701410871>.
47. J. Hsu; S. J. Chang; A. H. Franz, *J. Am. Soc. Mass Spectrom.* 2006, 17 (2), 194-204 <https://doi.org/10.1016/j.jasms.2005.10.010>.
48. E. F. Day; N. S. Dean; A. H. Franz, *Acta Crystallogr., Sect. C: Cryst. Struct. Commun.* 2006, C62 (9), o571 <https://doi.org/10.1107/s0108270106029532>.
49. T. T. M. Nguyen; P. H. Gross; A. H. Franz, *ARKIVOC* (Gainesville, FL, U. S.) 2005, (4), 110-128 <https://doi.org/10.3998/ark.5550190.0006.409>.
50. L. Jordan; T. T. Nguyen; J. Pwu; A. H. Franz, *J. Undergrad. Chem. Res.* 2005, 4 (1), 31-38.
51. A. H. Franz, *J. Am. Soc. Mass Spectrom.* 2005, 16 (5), 792 <https://doi.org/10.1016/j.jasms.2005.01.023>.
52. J. Pwu; A. H. Franz, *J. Undergrad. Chem. Res.* 2004, 3 (1), 27-33.
53. P. H. Gross; A. H. Franz; V. V. Samoshin, *Recent Res. Dev. Org. Chem.* 2004, 8 (Pt. 2), 255-280.
54. A. H. Franz; V. V. Samoshin; C. Myers; A. D. Hunter; P. H. Gross, *Carbohydr. Res.* 2003, 338 (9), 851-854 [https://doi.org/10.1016/s0008-6215\(03\)00048-x](https://doi.org/10.1016/s0008-6215(03)00048-x).
55. A. H. Franz; R. Liu; A. Song; K. S. Lam; C. B. Lebrilla, *J. Comb. Chem.* 2003, 5 (2), 125-137 <https://doi.org/10.1021/cc020083a>.
56. H. J. An; A. H. Franz; C. B. Lebrilla, *J. Chromatogr. A* 2003, 1004 (1-2), 121-129 [https://doi.org/10.1016/s0021-9673\(03\)00718-0](https://doi.org/10.1016/s0021-9673(03)00718-0).
57. M. M. Stone; A. H. Franz; C. B. Lebrilla, *J. Am. Soc. Mass Spectrom.* 2002, 13 (8), 964-974 [https://doi.org/10.1016/s1044-0305\(02\)00417-8](https://doi.org/10.1016/s1044-0305(02)00417-8).
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60. A. H. Franz; C. B. Lebrilla, *J. Am. Soc. Mass Spectrom.* 2002, 13 (4), 325-337 [https://doi.org/10.1016/s1044-0305\(02\)00343-4](https://doi.org/10.1016/s1044-0305(02)00343-4).
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63. A. H. Franz; P. H. Gross, *Carbohydr. Lett.* 1997, 2 (6), 371-376. Etoposide. Conformational and Hydration Features, Kangling Zhang, A. Franz, G. Craig Hill, C. Michael McCallum, and Michael J. Minch*, UOP, Department of Chemistry and School of Pharmacy, *Magn. Reson. Chem.*, 37, 788-798, 1999
64. ¹³C-¹³C Couplings in Doubly Labeled Ferrier Dimers, Andreas Franz, Paul Gross and Mike Minch*, UOP, *NMR Newslett.*, No. 481, October 1998

65. GLYCALS II. Synthesis and Derivatization of C-Disaccharides from D-Glucal, D-Galactal and L-Fucal by "Ferrier Dimerization", Andreas H. Franz, Paul H. Gross*, *Carbohydr. Lett.*, **2**, 371-376, **1997**
66. NOE-Difference Experiments on Rotationally Biased Ferrier-Dimers, M. Minch*, A. Franz, P. H. Gross, UOP, *NMR Newslett.*, No. 471, December **1997**

10) Presentations

1. NMR solution conformations of β 1-6 linked disaccharides, Leslie Tran, Jef Andrei Pelera, Andreas Franz, ACS National Meeting, San Francisco, CA, August 13-17, **2023**, CARB 3922674 (poster).
2. Photoionization of Pyrenemethylamine-Labeled Oligosaccharides - A New MALDI-TOF Precursor Ion-Type for Efficient Fragmentation, Andreas H. Franz, Aprilrose Fabro, Nathan Ta, Kendall Bromley, Hana Rosenblatt, Geoff Lin-Cereghino, ACS National Meeting, Chicago, IL, August 21-25, **2022**, CARB 2135 (poster).
3. NMR-Analysis, KARPLUS Equations, and Solution Geometry of β -1,6-Glycosidic Linkages, Amelia Watson, Andreas H. Franz, From Abstracts of Papers, 20th European Carbohydrate Symposium EUROCARB2019, Leiden, Netherlands, **2019** (poster).
4. Applications of Karplus Equations to 1,6 glycosidic Linkages in Pyranosides and Furanosides, Watson, Amelia, Franz, Andreas H., From Abstracts of Papers, 19th European Carbohydrate Symposium EUROCARB2017, Barcelona, Spain, July 02-06, **2017** (poster).
5. Application of newly developed Karplus equations for C(sp²)-O-C-H dihedral angles to the conformational analysis of ester linked carbohydrate derivatives, Sven Hackbusch, Amelia Watson, Stephen Do, Andreas Franz, 253rd ACS National Meeting, San Francisco, CA, April 02-06, **2017**, CARB 052 (poster).
6. New Karplus Equations for α -1,6-Linked Glycans, Amelia Watson, Stephen Do, Andreas H. Franz*, 253rd ACS National Meeting, San Francisco, CA, April 02-06, **2017**, CARB 053 (poster).
7. Phase-transfer-catalyzed oxidative esterification of primary alcohols by TEMPO, Sven Hackbusch, Andreas H. Franz, From Abstracts of Papers, 251st ACS National Meeting, San Diego, CA, March 13-17, **2016**, ORGN-286 (oral).
8. Novel 1 $\rightarrow$ 6- & 6 $\rightarrow$ 6-linked ester disaccharide analogs – synthesis and structural evaluation, Sven Hackbusch, Andreas H. Franz, From Abstracts of Papers, 251st ACS National Meeting, San Diego, CA, March 13-17, **2016**, CARB-57 (poster).
9. Development of Karplus equations for 1,6-linked disaccharides, Amelia Watson, Andreas H. Franz, From Abstracts of Papers, 251st ACS National Meeting, San Diego, CA, March 13-17, **2016**, CARB-58 (poster).
10. Acylation of trans-2-substituted cyclohexanols: Reversal of diastereoselectivity depends on scaffold substitution and achiral amine catalyst, Sven Hackbusch, Amelia Watson, Andreas H. Franz, From Abstracts of Papers, 248th ACS National Meeting, San Francisco, CA, August 10-14, **2014**, ORGN-184.
11. Long-range NMR ¹H,¹³C-coupling and conformational analysis of polyphenolic glycosides, Ilona Serebnitskaya, Andreas Franz, From Abstracts of Papers, 245th ACS National Meeting & Exposition, New Orleans, LA, United States, April 7-11, **2013** (2013), CARB-59
12. Efficient cellular delivery of methotrexate by liposomes containing novel amphiphiles with pH-triggerable conformations, Samoshina, Nataliya M.; Liu, Xin; Zheng, Yu; Franz, Andreas H.; Guo, Xin; Samoshin, Vyacheslav V., From Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-March 29, **2012** (2012), MEDI-415

13. Luciferase gene transfection mediated by cationic liposomes comprising novel trans-2-aminocyclohexanol-based amphiphiles, Liu, Xin; Zheng, Yu; Samoshina, Nataliya M.; Franz, Andreas H.; Samoshin, Vyacheslav V.; Guo, Xin, From Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-March 29, **2012** (2012), MEDI-414
14. Novel amphiphiles for pH-sensitive liposomes with trans-2-aminocyclohexanol-based conformational switch and the simplified models thereof, Zheng, Yu; Liu, Xin; Samoshina, Nataliya M.; Franz, Andreas H.; Guo, Xin; Samoshin, Vyacheslav V., From Abstracts of Papers, 243rd ACS National Meeting & Exposition, San Diego, CA, United States, March 25-March 29, **2012** (2012), COLL-322
15. NMR investigation of phospholipid/PEG-ceramide-liposomes Franz, Andreas H.*; Samoshina, Nataliya; Guo, Xin; Samoshin, Vyacheslav V., From Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, 2011 (2011), COLL-243
16. Variable diastereoselectivity in acylation of 2-substituted cyclohexanols Samoshin, Andrey; Visser, Jasper; Curtis, Matthew; Franz, Andreas H.* Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, **2011** (2011), ORGN-761.
17. pH-Triggered conformational switches based on trans-2-aminocyclohexanol moiety, Samoshin, Vyacheslav V.; Zheng, Yu; Liu, Xin; Samoshina, Nataliya M.; Chertkov, Vyacheslav A.; Franz, Andreas H.; Guo, Xin, From Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, **2011** (2011), ORGN-425.
18. pH-Sensitive liposomes with new trans-2-aminocyclohexanol-based amphiphiles as conformational switches for the liposome membrane, Samoshina, Nataliya M.; Liu, Xin; Zheng, Yu; Franz, Andreas H.; Guo, Xin; Samoshin, Vyacheslav V., From Abstracts of Papers, 241st ACS National Meeting & Exposition, Anaheim, CA, United States, March 27-31, **2011** (2011), COLL-245
19. Design of biocompatible pH-sensitive liposomes for drug and gene delivery, Guo, Xin; Samoshina, Nataliya M.; Chen, Haigang; Brazdova, Barbora; Franz, Andreas H.; Zhang, Huizhen; Szoka, Francis C.; Samoshin, Vyacheslav V., From Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, **2010** (2010), COLL-315 (ORAL).
20. N-linked Oligosaccharides Characterization of Glycoprotein of Aggregate Gland from Black Widow Spider, *Latrodectus Hesperus* Liang Zhao, Felicia Jeffery, Fan Xiang, Craig Viera, Andreas H. Franz* Annual Conference of the Society for Glycobiology November 7 – 10, **2010** TradeWinds Island Grand Resort, St. Pete Beach, FL
21. Progress in the Characterization of Glycosylation Microheterogeneity in *Xenopus laevis* Vitelline Envelope Glycoprotein ZPA Liang Zhao, Fan Xiang, Jerry L. Hedrick, Andreas H. Franz American Society for Mass Spectrometry 58th ASMS Conference, May 23 – 27, **2010** Salt Palace Convention Center, Salt Lake City, Utah
22. Analysis of N-linked Oligosaccharides from *Xenopus laevis* Vitelline Envelope Glycoprotein ZPA by Mass Spectrometry, Liang Zhao, Fan Xiang, Jerry L. Hedrick, Andreas H. Franz, Department of Chemistry, University of the Pacific, 3601 Pacific Avenue, Stockton, CA 95211, Shimadzu Biotech. Corporation, 7060 Koll Center Parkway, Suite 328, Pleasanton, CA, 94566, Department of Animal Science, University of California Davis, One Shields Avenue, Davis, CA 95616, Poster at the National Meeting of the American Chemical Society, San Francisco, **March 2010**
23. Arylsulfanyl-alkyl alcohols as chiral auxiliaries, Andrey V. Samoshin, Andreas H. Franz, Vyacheslav V. Samoshin, Poster at the National Meeting of the American Chemical Society, San Francisco, **March 2010**

24. Solution Geometry and Long-Range Coupling in Carbohydrate Mimetics from Glycal Dimerization, Andreas H. Franz*, Poster at the National Meeting of the American Chemical Society (also accepted as part of opening Sci-Mix), San Francisco, **March 2010**
25. *Trans*-2-Aminocyclohexanol-based lipids as pH-sensitive conformational switches for the PEG-grafted liposomes, Samoshina, Nataliya M.; Guo, Xin; Brazdova, Barbora; Zheng, Yu; Liu, Xin; Franz, Andreas H.; Samoshin, Vyacheslav V., From Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, **2010** (2010), MEDI-455.
26. Michael, Katja; Hogenauer, Tyrone; Cai, Zhefeng; Kaneshiro, Clyde M.; Dirk, Carl; Franz, Andreas H. New Methods for the Synthesis of Peptides and Glycopeptides. Abstracts, 65th Southwest Regional Meeting of the American Chemical Society, El Paso, TX, United States, November 4-7 (**2009**)
27. Progress towards the Characterization of N-linked Oligosaccharides from *Xenopus laevis* Vitelline Envelope Glycoprotein ZPA, Liang Zhao, Fan Xiang, Jerry L. Hedrick, Andreas H. Franz, Department of Chemistry, University of the Pacific, 3601 Pacific Avenue, Stockton, CA 95211, Shimadzu Biotech. Corporation, 7060 Koll Center Parkway, Suite 328, Pleasanton, CA, 94566, Department of Animal Science, University of California Davis, One Shields Avenue, Davis, CA 95616, 2009 Annual Meeting of the Society for Glycobiology, November 12 - 15, **2009**, San Diego, CA
28. Triggering Stealth Liposomes by pH-Sensitive Conformational Switch of Lipid Tails, Xin Guo, Nataliya Samoshina, Vyacheslav V. Samoshin, and Andreas Franz. Poster at the Meeting of the American Association for Pharmacutics (AAPS) **2009**.
29. Mass Spectrometric Analysis of Proteolytic Products from MBP-Containing Heterologous Proteins Expressed in *Pichia pastoris*, Zhiguo Li; Wilson Leung; Joan Lin-Cereghino; Geoffrey Lin-Cereghino; Fan Xiang; Andreas Franz, Department of Chemistry, University of the Pacific, 3601 Pacific Avenue, Stockton, CA; Department of Biology, University of the Pacific, 3601 Pacific Avenue, Stockton, CA; Shimadzu Biotech. Corporation, 7060 Koll Center Parkway, Suite 328, Pleasanton, CA, 94566, 57th ASMS Conference **2009**, Philadelphia, PA
30. Structure Elucidation of Disulfide Bonds in a Rhamnose-Binding Lectin from Salmon Eggs, Liang Zhao, Ruben T. Almaraz, Fan Xiang, Jerry L. Hedrick, Andreas H. Franz, Department of Chemistry, University of the Pacific, 3601 Pacific Avenue, Stockton, CA 95211, Department of Animal Science, University of California Davis, One Shields Avenue, Davis, CA 95616, Shimadzu Biotech. Corporation, 7060 Koll Center Parkway, Suite 328, Pleasanton, CA, 94566, 57th ASMS Conference **2009**, Philadelphia, PA
31. Structural elucidation of the MBP (Maltose Binding Protein) C-termini from fusion proteins in *Pichia pastoris* expression system, Zhiguo Li, Wilson Leung, Joan Lin-Cereghino, Geoff Lin-Cereghino, Andreas Franz (56th ASMS Conference, Denver, CO **2008**)
32. Mapping of Disulfide Bonds in Salmon Egg Lectin 24K Using Matrix-Assisted Laser Desorption/Ionization Liang Zhao¹; Ruben T. Almaraz²; Jerry L. Hedrick²; Fan Xiang³; Andreas H. Franz¹ ¹Department of Chemistry, University of the Pacific, Stockton, CA 95211; ²Department of Animal Sciences, UC Davis, Davis, CA 95616; ³Shimadzu Biotech Corp., Pleasanton, CA 94566 (Conference of the International Separation Science Society CASSS, Napa Valley, **2008**)
33. University of the Pacific, Department of Chemistry, Tuesday Seminars, Fall 2008, Andreas H. Franz, Department of Chemistry, Title: "Capabilities of the Pacific 600 MHz NMR Facility in the Chemistry Department" (**2008**)
34. pH-Sensitive, Ortho Ester-Based Cationic Lipoplexes for Gene Delivery, X. Guo¹, H. Chen¹, A.H. Franz¹, H. Zhang¹, F.C. Szoka², V.V. Samoshin³ (Poster, 3rd International

- Conference on Colloid Chemistry and Physicochemical Mechanics (ICC **2008**) in Moscow, Russia.
35. Design of Biocompatible pH-Sensitive Liposomes for Drug and Gene Delivery, X. Guo¹, H. Chen¹, B. Brazdova¹, A.H. Franz¹, H. Zhang¹, N. Zhang¹, F.C. Szoka², V.V. Samoshin³ (Talk by V. Samoshin, 3rd International Conference on Colloid Chemistry and Physicochemical Mechanics (ICC **2008**) in Moscow, Russia.
 36. Small-Molecule Oligosaccharide Tags for Derivatization of Glycans, Nandkishor Chindarkar, Andreas H. Franz* (9th Tetrahedron Symposium, Berkeley, CA, July 2008)
 37. 1,3 Dipolar Cycloaddition of Small-Molecule Alkyne Tags to Carbohydrate Azides, Nandkishor Chindarkar, Andreas H. Franz,* Poster at the 7th Tetrahedron Symposium for Synthetic Chemistry, Berlin, Germany, July **2007**.
 38. Progress Towards the Mass Spectrometric Determination of the N- and C- Termini of Zona Pellucida ZPX Glycoprotein from *X. laevis* Eggs, Zhiguo Li, Ruben T. Almaraz, Jerry L. Hedrick, Andreas H. Franz,* Poster at the 55th ASMS conference, Indianapolis, IN, June **2007**.
 39. Search for New Oligosaccharide Labels, Olga Goltvyanitsa, Nankishor Chindarkar, Andreas H. Franz,* Poster at the 232nd National ACS meeting, San Francisco, CA, September **2006**.
 40. The Unusual Chemical Structure of a Carbohydrate-Quinic Acid Compound, Quy Lam Nguyen, Andreas H. Franz*, Poster at the 232nd National ACS meeting, San Francisco, CA, September **2006**.
 41. Structural determination of the N- and C-terminus in gp41, the predominant glycoprotein in the vitelline envelope of *Xenopus laevis* eggs, Haiqiang Yu, Ruben Almaraz, Jerry Hedrick, Andreas H. Franz*, Poster at the 54th ASMS Conference, Seattle, WA, June **2006**.
 42. Synthesis and Analytical Evaluation of New Oligosaccharide Tags, Nandkishor S. Chindarkar, Olga Goltvyanitsa, Andreas H. Franz*, Poster at the Annual Conference of the Society for Glycobiology, Boston, MA, November **2005**.
 43. Folate Conjugated Micellar Carriers for Targeted Drug Delivery, Shiladitya Bhattacharya, Andreas H. Franz, Xiaoling Li, Bhaskara Jasti, Poster at the AAPS Meeting, Nashville, TN, November **2005**.
 44. Partial Determination of the Disulfide Bond Pattern in the Salmon Egg Lectin 24K Isolated from the Chinook Salmon *Oncorhynchus tshawytscha*, Haiqiang Yu, Kenji Murata, Jerry L. Hedrick, Fan Xiang, Andreas H. Franz,* Poster at the 53rd ASMS Conference, San Antonio, TX, June **2005**.
 45. Chromatographic Separation of Oligosaccharide Mixtures Labeled with a Multifunctional Tag, Joanne Hsu, Soo Jin Chang, Andreas H. Franz*, Poster at the Annual Conference of the Society for Glycobiology, Honolulu, HI, November **2004**.
 46. Modification of Per-O-Acetylated Carbohydrates, E. Nwadiibia (SEED high school student), A. Franz,* Poster at the 39th Western Regional ACS Meeting, Sacramento, CA, October **2004**.
 47. Progress towards the Determination of the Disulfide Bond Arrangement Pattern of Three Salmon Egg Lectins (SEL) Isolated from the Eggs of the Chinook Salmon *Oncorhynchus tshawytscha*, Poster at the 39th Western Regional ACS Meeting, Sacramento, CA, October **2004**.
 48. Inhibition of Soluble and Immobilized β -Galactosidases by D-Galactal and Cyano-D-Galactoside, N. Samoshina, A. Franz,* Poster at the 39th Western Regional ACS Meeting, Sacramento, CA, October **2004**.
 49. University of the Pacific - Department of Chemistry Fall 2004, Poster at the 39th Western Regional ACS Meeting, Sacramento, CA, October 2004.

50. New Multifunctional Tags for Oligosaccharides, Andreas H. Franz*, Joanne Hsu, Soo Jin Chang, UOP, Poster at the 52nd ASMS Conference, Nashville, TN, June **2004**.
51. Synthesis and Characterization of Per-O-Acetylated Glycosyl Cyanides from L-Fucose and D-Galactose, L. Jordan, T. T. Nguyen, A. H. Franz, Poster at the the 16th Annual Northern California Undergraduate Research Symposium, May **2004**.
52. Synthesis and Characterization of β -Cyclodextrin Scaffolds, G. Singh, D. Kambaliya, A. H. Franz, Poster at the the 16th Annual Northern California Undergraduate Research Symposium, May **2004**.
53. Calix[6]arene Derivatives Show Gas-Phase Complexation of Amino Acids in Electrospray Ionization Mass Spectrometry (ESI-MS), J. Pwu, A. H. Franz, UOP, Poster at the American Chemical Society Northern California Section **2003** Undergraduate Research Symposium.
54. Synthesis of Quinamide-Based Disaccharide Mimetics, T. T. Nguyen, P. Phiasivongsa, P. H. Gross, A. H. Franz, UOP, Poster at the Annual Conference of the Society for Glycobiology, San Diego, CA, December **2003**.
55. Synthesis and NMR-Analysis of 2-Amino-2-Deoxy-Mannuronic Acid Derivatives, K. Sigillo, T. Chiu, P. H. Gross, A. H. Franz, UOP, Poster at the Annual Conference of the Society for Glycobiology, San Diego, CA, December **2003**.
56. Non-Covalent Calixarene-Amino Acid Inclusion Complexes in the Gas-Phase, Andreas H. Franz, Carlito B. Lebrilla,* University of California Davis, Oral presentation at the Ion Spectrometry Meeting, Lake Arrowhead, CA, January **2002**.
57. Intrinsic Alkali Metal Ion Affinities of Calixarenes, Andreas H. Franz, Carlito B. Lebrilla,* University of California, Poster at the 50th ASMS Conference, Orlando, FL, June **2002**.
58. Non-covalent calixarene-amino acid complexes formed by MALDI-MS, Michele M. Stone, Andreas H. Franz, Carlito B. Lebrilla,* UC Davis, Poster at the 50th ASMS Conference, Orlando, FL, June **2002**.
59. Evidence for Long-Range Glycosyl Transfer Reactions in the Gas Phase, Andreas H. Franz, Carlito B. Lebrilla,* University of California Davis, Oral presentation at the Ion Spectrometry Meeting, Lake Arrowhead, CA, January **2001**.
60. New Oligosaccharide Labels and Evidence for Long-Range Glycosyl Transfer Reactions in the Gas-Phase, Andreas H. Franz, Tadeusz F. Molinski, Carlito B. Lebrilla,* UC Davis, Poster at the 49th ASMS Conference, Chicago, IL, May **2001**.
61. Oligosaccharide Mimics from Glycals (SCOM-2), Andreas H. Franz, Yi Qiu Wei, Vyacheslav V. Samoshin, Paul H. Gross,* Poster at the Glycobiology 2001 Meeting, San Francisco, CA, November **2001**.
62. Oligosaccharide Mimics – Synthesis and Characterization, Oral presentation at the 219th ACS-Meeting, San Francisco, CA, April **2000**
63. Partial APCI-MS Characterization of Glycal Dimers – A New Class of Carbohydrate Mimics, Andreas H. Franz, Paul H. Gross, Patrick R. Jones,* Poster at the 48th ASMS Conference on Mass Spectrometry and Allied Topics, Long Beach, CA, June **2000**
64. Structural Elucidation of Glycosyl Cyanides – An Unprecedented Double Bond Formation Upon Cyanation of the Dimer from L-Fucal, Andreas H. Franz, Vyacheslav V. Samoshin, Chris Myers, Allen D. Hunter, and Paul H. Gross,* Oral presentation at the 36th ACS Western Regional Meeting, San Francisco, CA, October **2000**
65. ¹³C-Enriched Ferrier Dimers – Investigation of the Serianni Rule, Andreas H. Franz,* Paul H. Gross, Poster at the 36th ACS Western Regional Meeting, San Francisco, CA, October **2000**

66. Inhibitory Effect of Carbohydrate Mimics Towards the Lectin Concanavalin A from *Canavalia ensiformis*, Kevin Myers, Andreas H. Franz, Paul H. Gross,* Poster at the 36th ACS Western Regional Meeting, San Francisco, CA, October **2000**
67. GLYCALS III: Structure and Conformation of Tri-O-acetyl-D-glucal Dimer in Solid State and in Solution, Poster at the XIX. International Carbohydrate Symposium, San Diego, CA, **1998**
68. GLYCALS IV: Saccharo-Mimetics from Glycal Precursors, Poster at the XIX. International Carbohydrate Symposium, San Diego, CA, **1998**
69. Molecular Dumbbells: NOE Experiments on Ferrier-Dimers, M. Minch,* A. Franz, P. Gross, University of the Pacific, Poster at the 39th ENC (Experimental Nuclear Magnetic Resonance Conference), Pacific Grove, CA, April **1998**
70. OCO-Tetrasaccharides and ¹³C-enriched Ferrier Dimers – Synthesis and Solution Conformation, A. Franz, M. J. Minch, P. H. Gross,* Oral presentation at the 34th ACS Western Regional Meeting, San Francisco, CA, October **1998**
71. GLYCALS - An Extended Study of the “Ferrier Dimerization”, A. Franz, P. H. Gross,* Oral presentation at the 213th ACS-Meeting, San Francisco, CA, April **1997**
72. GLYCALS. Dihydroxylation study of Ferrier Dimers, A. Franz, P. H. Gross,* Poster at the 5th Chemical Congress of North America, Cancun (Mexico), November **1997**

11) Invited Talks

1. Konformationen von Oligosacchariden mit α/β -1,6-Glykosidischen Bindungen, Universitaet Tuebingen, Germany, June 25, **2019**.
2. Solution Conformation of Oligosaccharides with 1,6-Glycosidic Linkages, San Francisco State University, April 03, **2019**.
3. NMR Structure assignment and H/D-exchange behavior of glycosylated polyphenols, Sacramento State University, October 03, **2014**
4. NMR Structure assignment and H/D-exchange behavior of glycosylated polyphenols, San Jose State University, September 33, **2014**
5. “Synthesis and NMR Structure Studies of Carbohydrate Mimetics”, invited by University of Minnesota, Duluth, October **2012**.
6. “Small Cluster Oligosaccharide Mimetics”, invited by Universitaet Giessen, Germany, June **2012**.
7. Post-Translational Modifications of Proteins from the Chinook Salmon and from *Xenopus laevis*, invited by Sacramento State University, October **2011**.
8. NMR Solution Structure of two C-Glycosidic Tetrasaccharide Mimetics Andreas H. Franz, **invited** by the Organizers of the Annual NMR Summer School, Moscow State University, Moscow (Russia), July **2010**.
9. Synthesis and Characterization of Small Cluster Oligosaccharide Mimetics, Andreas H. Franz, Paul H. Gross, Vyacheslav V. Samoshin, University of El Paso Texas, **invited** by the Southwestern Regional ACS Meeting, El Paso, TX, November **2009**.
10. Small Cluster Oligosaccharide Mimetics and Multifunctional Small-Molecule Tags for Oligosaccharides, Moscow, Russia, June **2008** (**invited** by the Chemistry Faculty at the Moscow State Academy of Fine Chemical Technology and **invited** by the Faculty of Carbohydrate Chemistry at the Russian Academy of Sciences).
11. Small Cluster Oligosaccharide Mimetics and Synthetic Oligosaccharide Labels, California State University San Francisco, October **2005**.

12. Carbohydrate Chemistry; Synthetic and Analytical Aspects of Oligosaccharides and Small Cluster Oligosaccharide Mimics (SCOM), California State University Sacramento, March **2004**.
13. Oligosaccharides – Synthesis and Analytical Challenges / Non-Covalent Inclusion Complexes of Modified Calixarenes, Central Michigan University, Mt. Pleasant, March **2002**.

12) Graduate students and Thesis/Dissertations

- Chair of committee: Leslie Tran, Ph. D. (TBD)
 Cate Simmermaker, Ph.D. (June 2023)
 Amelia Watson, Ph. D. (June 2019)
 Sven Hackbusch, Ph. D. (June 2017)
 Ilona Serebnitskaya, M. S. (April 2014)
 Andrey Samoshin, M. S. (June 2011)
 Liang Zhao, Ph. D. (May 2011)
 Zhiguo Li, Ph.D. (June 2010)
 Nandkishor Chindarkar, Ph. D. (November 2008)
 Haiqiang (Bill) Yu, Ph. D. (October 2006)
 Vishwas Rai, M. S. (November 2007, not completed)
- Member of committee: Arkansha Jain (M. S., TBD)
 Tommy Nguyen (Ph. D., TBD)
 Nghia Tran (Ph. D., TBD)
 Landy Gu (Ph. D., spring 2024)
 Vanessa Rangel (Ph. D., fall 2023)
 Carim van Beek (Ph.D., spring 2020)
 Mulinde Ronnie Ruyonga (Ph. D., summer 2019)
 Marcos Beltran –Sanchez (M.S., summer 2019)
 Krege Christison (Ph. D., summer 2019)
 Siwen Wang (Ph. D., 2018)
 Zufan Wu (Ph. D., 2016 TBD)
 Anoopjit Singh (M.S., not completed)
 Manali Aggrawal (Ph. D., November 2013)
 Xin (Lucine) Liu (Ph. D., May 2013)
 Yu (Jerome) Zheng (Ph. D., May 2013)
 Lu Xu (Ph. D., March 2013)
 Priyanka Chitranshi (Ph.D., December 2012)
 Matthew Curtis (Ph. D., August 2012)
 Hassan Shallal (Ph. D., March 2011)
 Smita Matkar (Ph. D., spring 2008)
 Barbora Brazdova (Ph. D., Oct. 2006)
 Urja Narayan (M. S., Nov. 2005)
 Jing Yuan (Ph. D., Sept. 2005)
 Eric Chen (M. S., July 2005)
 Xiaoyi (Tiger) Hu (Ph. D., Oct. 2004)
 David Hawke (Ph. D., Oct. 2004)

13) Grants

1. Fall 2024: Acquisition of a new MALDI-TOF-TOF mass spectrometer for research and teaching, NSF, *funded* (\$401,144.00) PI (co-PIs: Xue, Carlson, Pantouris, Duzgunes, Lin-Cereghino)
2. Spring 2020: EXTENSION (see below) – 6 months, 04/01/20-09/30/20, *granted*

3. Spring 2019: RENEWAL (see below), 04/01/19-03/31/20, *granted*
4. Spring 2018: RENEWAL - Conformational analysis of oligosaccharides - Quantitative description of oxymethylene- and aminomethylene-glycosidic linkages by NMR coupling constants and molecular modeling, Extreme Science and Engineering Discovery Environment (XSEDE), 04/01/18-03/31/19, *granted*
5. MRI: Acquisition of An Isothermal Titration Calorimeter for Studying Ligand-Macromolecule Interactions, NSF, \$140,256, 01/01/19-12/31/2022 *funded*. Co-PI (PI: Dr. Liang Xue, chemistry)
6. Summer 2018: Analysis of secretory mechanisms and heterologous proteins in *Pichia pastoris*, NIH, \$298,426, 07/01/18-06/30/2021 *funded*. Co-PI (PI: Drs. Lin-Cereghino, biology)
7. Spring 2017: Conformational analysis of oligosaccharides - Quantitative description of oxymethylene- and aminomethylene-glycosidic linkages by NMR coupling constants and molecular modeling, Extreme Science and Engineering Discovery Environment (XSEDE), 04/01/17-03/31/18, *granted*.
8. Fall 2015: "Full NMR Solution Structure Determination of Glycosylated Polyphenols", PI, Allen Foundation, \$75,251.00, *not funded*.
9. Fall 2015: "Conformational Analysis of Oligosaccharides", PI, National Science Foundation, \$529,748.00, 09/01/16-08/31/19, *not funded*.
10. Fall 2015: "RUI: Analysis of Factors Affecting Protein Secretion in *Pichia pastoris*", National Science Foundation, \$378,470.00, 09/01/16 - 08/31/19, co-PI under Lin-Cereghino (Biology), *not funded*.
11. Spring 2015: "Investigation of plant defense to Pierce's disease in grapevines - Characterization, synthesis and structural study the glycosidic linkage of glycosidic polyphenols and related molecules", Pacific Fund, \$1,978.20, *funded*.
12. Stauffer Charitable Trust, Challenge Grant for an endowed fund supporting summer undergraduate research stipends for chemistry and biochemistry majors (together with Mike McCallum), \$500,000.00 (to be matched by Pacific for \$1,000,000.00), January 2014, *funded (matching fundraising complete, fall 2016)*.
13. Spring 2009: "*trans*-2-Aminocyclohexanol Lipids as pH-sensitive Conformational Switches in Liposomes for Drug Delivery", American Chemical Society – TEVA Pharmaceuticals, \$300,000.00, 09/01/09 – 08/31/12 (extended by 6 months)
14. Spring 2008: CAPD Grant ("A Cyber-Enabled Course Module for Magnetic Resonance Spectroscopy") \$3,500.00, *funded*.
15. Summer 2007: NSF-Major Research Instrumentation ("Acquisition of a High-Field NMR spectrometer") \$523,535.00, *funded*.
16. Summer 2006: Eberhard Research Scholarship (UOP-internal, "The Unusual Structure of a Carbohydrate-Quinic Acid Compound") \$3,500.00, *funded*.
17. Spring 2006: A folate labeled micellar delivery system for hydrophobic anticancer drugs (co-PI) *funded* \$150,000.00
18. Spring 2005: External contract work: MALDI-Mass Spectrometry of oligosaccharide standards (PROZYME, Inc., San Leandro, CA) annual ~ \$5,000.00.
19. Summer 2005: CAPD Grant (Fluorescence Spectroscopy – An Interdisciplinary Tool, co-authored) *funded* \$ 1,500.00
20. Summer 2005: CAPD Grant (Extended and Improved Use of High-Performance Liquid Chromatography (HPLC) in the Undergraduate Chemistry Curriculum), *funded* \$ 2,000.00
21. Summer 2004: SEED Grant 2004 (UOP-internal, "Identification of New Glycosidase Inhibitors by Frontal Affinity Chromatography/MS") *funded* \$ 2,500.00

22. Summer 2003: Scholarly Artistic Activity Grant (UOP-internal, “A New Bioaffinity Tag for Oligosaccharides”) *funded* \$ 1,375.00