LYNETTE CEGELSKI

ASSOCIATE PROFESSOR OF CHEMISTRY
AND (BY COURTESY) CHEMICAL ENGINEERING
STANFORD UNIVERSITY
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ACADEMIC HISTORY

SUNY-Binghamton, New York B.S. Chemistry, *summa cum laude* and Phi Beta Kappa	1998
Washington University, St. Louis, Missouri Ph.D. Biophysical Chemistry – Laboratory of Prof. Jacob Schaefer	2004
Washington University School of Medicine, St. Louis, Missouri Postdoctoral Fellow; Molecular Microbiology – Laboratory of Prof. Scott J. Hultgren	2004-2008

FELLOWSHIPS AND HONORS

Phi Beta Kappa	1997
B.S. Chemistry *summa cum laude*	1998
American Chemical Society Senior of the Year Award, Binghamton University	1998
Honorable Mention: National Science Foundation Predoctoral Fellowship	1998
Dean's Graduate Student Academic Fellowship, Washington University	1998 - 1999
NIH Chemistry Biology Interface Pathway Fellow Washington University, Department of Chemistry	2000 - 2002
GRASP NMR Symposium 2006 Best Poster Presentation Award *Poster*: REDOR NMR for the Macromolecular Structural Biologist	2006
NIH NRSA Institutional Research Training Grant, Infectious Disease Division Department of Internal Medicine, Washington University	2006 - 2007
Burroughs Wellcome Fund Career Award at the Scientific Interface	2008 – 2013
Terman Fellowship, Stanford University	2008
2010 NIH Director's New Innovator Award	2010 - 2015
Terman Fellowship, Stanford University	2011
Hellman Faculty Scholar Award	2012
NSF CAREER Award	2015
Founder's Medal Award - International Council on Magnetic Resonance in Biological Systems	2018
Chambers Fellowship, Stanford University	2018
Presidential Early Career Award for Scientists and Engineers (PECASE)	2019

EMPLOYMENT HISTORY

Postdoctoral Fellow, Washington University School of Medicine, St. Louis, MO; Department of Molecular Microbiology	12/2004 - 2008
Acting Assistant Professor, Stanford University, Stanford, CA; Dept. of Chemistry	2008 - 2009
Assistant Professor, Stanford University, Stanford, CA; Dept. of Chemistry	2009 – 2017
Associate Professor, Stanford University, Stanford, CA; Dept. of Chemistry	2017-present

PROFESSIONAL ASSOCIATIONS

Associated Member of the Cluster of Excellence, "Matters of Activity," Humboldt-Universität zu Berlin.
Faculty Fellow, Stanford ChEM-H Institute
Faculty Member, Stanford Biophysics Program
Member, American Chemical Society
Member, Biophysical Society
Member, American Society of Microbiology

PROFESSIONAL SERVICE

Conference Session Organizer. "Recent Advances and Applications in NMR Spectroscopy." ACS Western Regional Meeting. Santa Clara, CA. 08/16/13.
Conference Co-organizer. "Transformative Measurements and Experimental Approaches for Bacterial Biofilms" at the Okinawa Institute for Science and Technology (OIST). Okinawa, Japan. June 28-30, 2017.
Guest Editor: Special Issue on "NMR Spectroscopy for Atomistic Views of Biomembranes and Cell Surfaces" in *Biophysica et Biochimica Acta* (2014).
Journal Reviewer: ACS Central Science, Applied and Environmental Microbiology; Biochimica et Biophysica Acta, Biochemistry; Biophysical Journal; Chemical Science; Infection and Immunity; Journal of the American Chemical Society (JACS); Journal of Bacteriology; Journal of Magnetic Resonance; Journal of Structural Biology; Magnetic Resonance in Chemistry; mBio; Molecular Microbiology, Nature; Nature Methods; PLoS One; PLoS Pathogens; PNAS; Solid-State Nuclear Magnetic Resonance; Science.

ADMINISTRATIVE COMMITTEES (RECENT)
Department of Chemistry, Graduate Student Admissions Committee (2009 – Present)
Department of Chemistry, Seminar Committee (2012 – Present)
Department of Chemistry, Junior Faculty Search Committee, Chair (2018-2019)

PUBLICATIONS

1. Li Y, Poliks B, Cegelski L, Poliks M, Gryczynski Z, Piszczek G, Jagtap PG, Studelska DR, Kingston DGI, Schaefer J, Bane S. **Conformation of Microtubule-Bound Paclitaxel Determined by Fluorescence Spectroscopy and REDOR NMR.** *Biochemistry* (2000) 39, 281-291.
2. Kim SJ, Cegelski L, Studelska DR, O'Connor RD, Mehta AK, Schaefer J. **REDOR Characterization of Vancomycin Binding Sites in *S. aureus*.** *Biochemistry* (2002) 41, 6967-6977.
3. Cegelski L, Hing AW, Kim SJ, Studelska DR, O'Connor RD, Mehta AK, Schaefer J. **REDOR Characterization of Vancomycin Mode of Action in *S. aureus*.** *Biochemistry* (2002) 41, 13053-13058.
4. Mehta AK, Cegelski L, O'Connor RD, Schaefer J. **REDOR with a Relative Full-Echo Reference.** *Journal of Magnetic Resonance* (2003) 163, 182-187.
5. Cegelski L, Rice CV, O'Connor RD, Caruano AL, Tochtrop GP, Cai ZY, Covey DF, Schaefer J. **Mapping the Locations of Estradiol and Potent Neuroprotective Analogues in Phospholipid Bilayers by REDOR.** *Drug Development Research* (2005) 66, 93-102.
6. Cegelski L and Schaefer J. **Glycine Metabolism in Intact Leaves by *in vivo* $^{13}CO_2$ and ^{15}N Labeling.** *Journal of Biological Chemistry* (2005) 280, 39238-39245.
7. Cegelski L and Schaefer J. **Photorespiration in Intact Leaves by *in vivo* $^{13}CO_2$ Labeling.** *From the cover. Journal of Magnetic Resonance* (2006) 178, 1-10.
8. Toke O, Cegelski L, Schaefer J. **Peptide Antibiotics in Action: Investigation of Polypeptide Chains in Insoluble Environments by REDOR.** Review: *Biochimica et Biophysica Acta* (2006) 1758, 1314-1329.

9. Cegelski L, Steuber D, Mehta AK, Kulp DW, Axelsen PH, Schaefer J. **Conformational and Quantitative Characterization of Oritavancin–Peptidoglycan Complexes in Whole Cells of *Staphylococcus aureus* by *in vivo* ^{13}C and ^{15}N Labeling.** *Journal of Molecular Biology* (2006) 357, 1253-62.

10. Kim SJ, Cegelski L, Preobrazhenskaya MN, Schaefer J. **Structures of *Staphylococcus aureus* Cell-wall Complexes with Vancomycin, Eremomycin, and Oritavancin Analogues by ^{13}C{^{19}F} and ^{15}N{^{19}F} Rotational-echo Double Resonance.** *Biochemistry* (2006) 45, 5235-5250.

11. Bann JG, Cegelski L, Hultgren SJ. **LRP6 Holds the Key for the Entry of Anthrax Toxin.** *Cell* (2006) 124, 3-5.

12. Paik Y, Yang C, Metaferia B, Tang S, Bane S, Ravindra R, Shanker N, Alcaraz AA, Johnson SA, Schaefer J, O'Connor RD, Cegelski L, Snyder JP, Kingston DGI. **REDOR NMR Distance Measurements for the Tubulin-Bound Paclitaxel Conformation.** *Journal of the American Chemical Society* (2007) 129, 361-370.

13. Kim SJ, Cegelski L, Stueber D, Singh M, Dietrich E, Tanaka KS, Parr TR, Farand AR, Schaefer J. **Oritavancin Exhibits Dual Mode of Action to Inhibit *S. aureus* Peptidoglycan Biosynthesis.** *Journal of Molecular Biology* (2008) 377, 281-293.

14. Cegelski L, Marshall GR, Eldridge GR, Hultgren SJ. **The Biology and Future Prospects of Anti-Virulence Therapies.** *Nature Reviews Microbiology* (2008) 6, 17-27.

15. Justice SJ, Hunstad DH, Cegelski L, and Hultgren SJ. **Morphological Plasticity as a Bacterial Survival Strategy.** *Nature Reviews Microbiology* (2008) 6, 162-168.

16. Cegelski L, Pinkner JS, Hammer ND, Cusumano CK, Hung CS, Chorell E, Åberg V, Walker JN, Seed PC, Almqvist F, Chapman MR, and Hultgren SJ. **Small Molecule Inhibitors Target *E. coli* Amyloid Biogenesis and Biofilm Formation.** *Nature Chemical Biology* (2009) 5, 913-919.

17. Cegelski L, Smith CL, Hultgren SJ. **Adhesion, Microbial**. In *The Encyclopedia of Microbiology*, 3rd Edition, edited by Moselio Schaechter, Elsevier (2009) 2-10.

18. Cegelski L*, O'Connor RD, Stueber D, Singh M, Poliks B, and Schaefer J. **Plant Cell-Wall Cross-Links by REDOR NMR Spectroscopy.** *Journal of the American Chemical Society* (2010) 132, 16052-16057.

19. Toke O and Cegelski L*. **REDOR Applications in Biology: an Overview.** In *Solid-State NMR Studies of Biopolymers (2010).* McDermott, AE and Polenova, T (eds). John Wiley & Sons Ltd, Chichester, UK, pp 473-490.

20. Lim JY, May J, and Cegelski L*. **DMSO and Ethanol Elicit Increased Amyloid Biogenesis and Amyloid-integrated Biofilm Formation in *E. coli*.** *Journal of Applied and Environmental Microbiology* (2012) 78, 3369-3378.

21. Wu C, Lim JY, Fuller G, and Cegelski L*. **Quantitative Analysis of Amyloid-integrated Biofilms Formed by Uropathogenic *E. coli* at the Air-liquid Interface.** *Biophysical Journal* (2012) 103, 464-471.

22. Zhou X and Cegelski L*. **Nutrient-Dependent Structural Changes in *S. aureus* Peptidoglycan Revealed by Solid-State NMR Spectroscopy.** *Biochemistry* (2012) 51, 8143-8153.

23. Wu C, Lim JY, Fuller G*, and Cegelski L*. **Disruption of *E. coli* Amyloid-Integrated Biofilm Formation at the Air-Liquid Interface by a Polysorbate Surfactant**. *Langmuir* (2013) 29, 920–926.

24. McCrate OA, Zhou X, and Cegelski L*. **Curcumin as an Amyloid-specific Dye**. *Chemical Communications* (2013) 49, 4193-4195.

25. McCrate OA, Zhou X, Reichhardt, CCR, and Cegelski L*. **Sum of the Parts: Composition and Architecture of the Bacterial Extracellular Matrix**. *Journal of Molecular Biology* (2013) 425: 4286-4294.

26. Cegelski L. **REDOR NMR for Drug Discovery.** *Bioorganic & Medicinal Chemistry Letters* (2013) 23, 5767-5775.

27. Lim JY, Pinkner J, and Cegelski L. **Community Behavior and Amyloid-associated Phenotypes, among a Panel of Uropathogenic *E. coli*.** *Biochemical and Biophysical Research Communications* (2014) 443, 345-350.

28. Reichhardt C and Cegelski L. **Solid-State NMR for Bacterial Biofilms.** *Molecular Physics* (2014) 112, 887-894.

29. Saggu M, Carter B, Zhou X, Faries K, Cegelski L, Holten D, Boxer SG, and Kirmaier C. **Putative Hydrogen Bond to Tyrosine M208 in Photosynthetic Reaction Centers from *Rhodobacter capsulatus* Significantly Slows Primary Charge Separation.** *Journal of Physical Chemistry B* (2014) 118, 6721-6732.

30. Hollenbeck E, Fong JCN, Lim JY, Yildiz F, Fuller GG, and Cegelski L. **Molecular Determinants of Mechanical Properties of *V. cholerae* Biofilms at the Air-Liquid Interface.** *Biophysical Journal* (2014) 107, 2245-2252.

31. Reichhardt C, Fong JCN, Yildiz F, and Cegelski L. **Characterization of the *Vibrio cholerae* Extracellular Matrix: A Top-Down Solid-State NMR Approach.** *Biochimica et Biophysica Acta* - Special Issue on "NMR Spectroscopy for Atomistic Views of Biomembranes and Cell Surfaces" (2015) 1848, 378-383.

32. Cegelski L and Weliky D. **NMR Spectroscopy for Atomistic Views of Biomembranes and Cell Surfaces.** *Biochimica et Biophysica Acta* (2015) 1848, 201-202.

33. Loy BA, Lesser AB, Staveness D, Billingsley KL, Cegelski L, and Wender PA. **Toward a Biorelevant Structure of Protein Kinase C Bound Modulators: Design, Synthesis, and Evaluation of Labeled Bryostatin Analogues for Analysis with Rotational Echo Double Resonance NMR Spectroscopy**. *JACS* (2015) 137, 3678-3685.

34. Cegelski L. **Bottom-Up and Top-Down Solid-State NMR Approaches for Bacterial Biofilm Matrix Composition.** *Journal of Magnetic Resonance* (2015) 253, 91-97.

35. Nygaard R, Romaniuk JAH, Rice DM, and Cegelski L. **Spectral Snapshots of Bacterial Cell-Wall Composition and the Influence of Antibiotics by Whole-Cell NMR**. *Biophysical Journal* (2015) 108, 1380-1389.

36. Reichhardt C, Ferreira JAG, Joubert L, Clemons KV, Stevens DA, Cegelski L. **Analysis of the Aspergillus fumigatus Biofilm Extracellular Matrix by Solid-State Nuclear Magnetic Resonance Spectroscopy**. *Eukaryotic Cell* (2015) 14, 1064-1072.

37. Jones C, Utada A, Davis KR, Thongsomboon W, Sanchez DZ, Banakar V, Cegelski L, Wong GCL, Yildiz FH. **Cyclic-di-GMP Regulates Motile to Sessile Transition by Modulating MshA Pili Biogenesis and Near-Surface Motility Behavior in *Vibrio cholerae*.** *PLoS Pathogens* (2015) 11, e1005068.

38. Romaniuk JAH and Cegelski L. **Bacterial Cell Wall Composition and the Influence of Antibiotics by Cell-Wall and Whole-Cell NMR.** *Philosophical Transactions of the Royal Society* (2015) 370:20150024.

39. Maher MC, Lim JY, Gunawan C, Cegelski L. **Cell-Based High-Throughput Screening Identifies Rifapentine as an Inhibitor of Amyloid and Biofilm Formation in *E. coli.*** *ACS Infectious Diseases* (2015) 1, 460-468.

40. Rice DM, Romaniuk JAH, Cegelski L. **Frequency selective REDOR-Spin Diffusion Relays in Uniformly Labeled Whole Cells.** *Solid-state Nuclear Magnetic Resonance* (2015) 72, 132-139.

41. Reichhardt C, Jacobcon AN, Maher MC, Uang J, McCrate OA, Eckart M, and Cegelski L. **Congo Red Interactions with Curli-producing *E. coli* and Native Curli Amyloid Fibers.** *PLoS One* (2015) DOI: 10.1371/journal.pone.0140388.

42. Hollenbeck E, Douarche C, Allain J, Roger P, Regeard C, Cegelski L, Fuller GG, Respaud E. **Mechanical**

Behavior of a *Bacillus subtilis* Pellicle. *Journal of Physical Chemistry B* (2016) 120, 6080-6088.

43. Reichhardt C, DA Stevens, and Cegelski L. **Fungal Biofilm Composition and Opportunities in Drug Discovery.** *Future Medicinal Chemistry* (2016) 8, 1455-1468.

44. Reichhardt C, McCrate OA, Zhou X, Lee J, Thongsomboon W, Cegelski L*. **Influence of the Amyloid Dye Congo Red on Curli, Cellulose, and the Extracellular Matrix in *E. coli* during Growth and Matrix Purification.** *Analytical and Bioanalytical Chemistry* (2016) 408, 7709-7717.

45. Joubert L*, Ferreira JAG, Stevens DA, Cegelski L. **Visualization of *Aspergillus fumigatus* Biofilms with Scanning Electron Microscopy and Variable Pressure-Scanning Electron Microscopy: a Comparison of Processing Techniques**. *Journal of Microbiological Methods* (2016) 132, 46-55.

46. Cegelski L*. **Disentangling Nanonets: Human α-Defensin 6 Targets *C. albicans* Virulence**. *Biochemistry* (2017) 56, 1027-1028.

47. Chen Z, Mercer JAM, Zhu X, Romaniuk JAH, Pfattner R, Cegelski L, Martinez TJ*, Burns NZ*, Xia Y*. **Mechanochemical Unzipping of Insulating Polyladderene to Semiconducting Polyacetylene**. *Science* (2017) 357, 475-479.

48. Nygaard R, Romaniuk JAH, Rice DM, Cegelski L*. **Whole Ribosome NMR: Dipolar Couplings and Contributions to Whole Cells**. *Journal of Physical Chemistry B* (2017) 121, 9331-9335.

49. Nazik H, Joubert LM, Secor PR, Sweere JM, Bollyky PL, Sass G, Cegelski L, Stevens DA*. ***Pseudomonas* Phage Inhibition of *Candida albicans*.** *Microbiology* (2017) 163, 1568-1577.

50. Bartlett C, Bansal S, Burnett A, Suits M, Schaefer J, Cegelski L*, Horsman G*, Weadge J*. **Whole-cell Detection of C-P bonds in Bacteria**. *Biochemistry* (2017) 56, 5870-5873.

51. Yang H, Staveness D, Ryckbosch SM, Loy BA, Axtman AD, Barnes AB, Pande VS, Schaefer J*, Wender PA*, Cegelski L*. **REDOR NMR Reveals Multiple Conformers for a Protein Kinase C Ligand in a Membrane Environment.** *ACS Central Science* (2018) 4, 89-96.

52. Thongsomboon W, Serra DO, Possling A, Hadjineophytou C, Hengge R*, and Lynette Cegelski*. **Phosphoethanolamine Cellulose: a Naturally Produced Chemically Modified Cellulose**. *Science* (2018) 359, 334-338.

53. Romaniuk JAH and Cegelski L*. **Peptidoglycan and Teichoic Acid Levels and Alterations in *S. aureus* by Cell-Wall and Whole-Cell NMR.** *Biochemistry* (2018) 57, 3966-3975.

54. Reichhardt C and Cegelski L*. **The Congo Red Derivative FSB Binds to Curli Amyloid Fibers and Specifically Stains Curliated *E. coli*.** *PLoS One* (2018) 13(8):e0203226.

55. Su JK, Feist JD, Yang J, Mercer JAM, Romaniuk JAH, Chen Z, Cegelski L, Burns NZ, Xia Y*. **Synthesis and Mechanochemical Activation of Ladderene-Norbornene Block Copolymers.** *JACS* (2018) 140, 12388-12391.

56. Hollenbeck EC, Antonoplis A, Chai C, Thongsomboon W, Fuller G*, Cegelski L*. **Phosphoethanolamine Cellulose Enhances Curli-Mediated Adhesion of Uropathogenic *Escherichia coli* to Bladder Epithelial Cells**. *PNAS* (2018) 115, 10106-10111.

57. Antonoplis A, Zang X, Huttner MA, Chong K, Lee YB, Co JY, Amieva M, Kline KA, Wender PA*, Cegelski L*. **A Dual Function Antibiotic-Transporter Conjugate Exhibits Superior Activity in Sterilizing MRSA Biofilms and Killing Persister Cells.** *JACS* (2018) 140, 16140-16151.

58. Reichhardt C, Joubert LM, DA Stevens, and Cegelski L*. **Integration of Electron Microscopy and Solid-state NMR Analysis for New Views and Compositional Parameters of Aspergillus fumigatus Biofilms.** *Medical Mycology* (2019) 57, S239-S244.

59. Beebout CJ, Eberly AR, Werby SH, Reasoner S, Brannon JR, De S, Fitzgerald MJ, Huggins MM, Clayton DB, Cegelski L, Hadjifrangiskou M*. **Respiratory Heterogeneity Shapes Biofilm Formation and Host Colonization in Uropathogenic *Escherichia coli*.** *mBio* (2019) 10(2) e02400-18.

60. Zamorano-Sanchez D, Xian W, Lee C, Salinas M, Thongsomboon W, Cegelski L, Wong G, Yildiz F*. **Functional Specialization in Vibrio cholerae Diguanylate Cyclases: Distinct Modes of Motility Suppression and c-di-GMP Production**. *mBio* (2019) 10(2) e00670-19.

61. Yang J, Horst M, Romaniuk JAH, Jin Z, Cegelski L, Xia Y*. **Benzoladderene Mechanophores: Synthesis, Polymerization, and Mechanochemical Transformation.** *JACS* (2019) 141, 6479-6483.

62. Werby S and Cegelski L*. **Spectral Comparisons of Mammalian Cells and Intact Organelles by Solid-State NMR.** *J Structural Biology* (2019) 206, 49-54.

63. Werby S and Cegelski L*. **Design and Implementation of a Six-Session CURE Module using Biofilms to Explore the Chemistry-Biology Interface.** Werby SH and Cegelski L*. *Journal of Chemical Education* (2019) 96, 2050-2054.

64. Rabiah NI, Romaniuk JAH, Fuller GG, Scales CW, Cegelski L*. **Carbon Compositional Analysis of Hydrogel Contact Lenses by Solid-State NMR Spectroscopy.** *Solid-State NMR* (2019) 102, 47-52.

65. Jeffries J, Fuller GG, Cegelski L*. **Unraveling *E. coli*'s Cloak: Identification of Phosphoethanolamine Cellulose, its Functions, and Applications.** *Microbiology Insights* (2019) https://doi.org/10.1177/1178636119865234.

66. Antonoplis A, Zang X, Wegner T, Wender PA*, Cegelski L*. **A Vancomycin-Arginine Conjugate Inhibits Growth of Carbapenem-resistant *E. coli* and Targets Cell-Wall Synthesis.** *ACS Chemical Biology* (2019) 14, 2065-2070.

67. Shen J, Gurtner GC, Cegelski L, Yang YP*. **Mechanisms of Action and Chemical Origins of Biologically Active Antimicrobial Polymers.** Book chapter *in* Racing for the Surface: Pathogenesis of Implant Infection and Advanced Antimicrobial Strategies (2019).

68. Abriat C, Enriquez K, Virgilio N, Cegelski L, Fuller GG, Daigle F, Heuzey M. **Mechanical and Microstructural Insights of *Vibrio cholerae* and *Escherichia coli* Dual-species Biofilm at the Air-liquid Interface**. *Colloids and Surfaces B: Biointerfaces* (2020) 188, 110786.

69. Thongsomboon W, Werby SH, Cegelski L. **Evaluation of Phosphoethanolamine Cellulose Production among Bacterial Communities using Congo Red Fluorescence.** *Journal of Bacteriology* (2020) 202, e00030-20.

70. Yang H, Horst M, Werby SH, Cegelski L, Burns NZ, Xia Y. **Bicyclohexene-*peri*-naphthalenes: Scalable Synthesis, Diverse Functionalization, Efficient Polymerization, and Facile Mechanoactivation of Their Polymers**. *Journal of the American Chemical Society* (2020) 142, 14619-14626.

71. Jeffries J, Thongsomboon W, Visser JA, Enriquez K, Yager D, Cegelski L. **Variation in the ratio of curli and phosphoethanolamine cellulose associated with biofilm architecture and properties**. *Biopolymers* (2020) e23395.

72. Boswell BR, Mansson CMF, Cox JM, Jin Z, Romaniuk JAH, Lindquist KP, Cegelski L, Xia Y, Lopez SA, Burns NZ. **Mechanochemical synthesis of an elusive fluorinated polyacetylene**. *Nature Chemistry* (2021) 13, 41-46.

73. Neville LF, Shalit I, Warn PA, Scheetz MH, Sun J, Chosy MB, Wender PA, Cegelski L, Rendell JT. ***In vivo* Targeting of *E. coli* with Vancomycin-arginine**. *Antimicrobial Agents and Chemotherapy* (2021) 65, e02416-20.

74. Acheson JF, Ho R, Goularte NF, Cegelski L, Zimmer J. **Molecular Organization of the *E. coli* Cellulose Synthase Macrocomplex.** *Nature Structural and Molecular Biology* (2021) 28, 310-318.

PATENTS AND PATENT APPLICATIONS

1. "Methods for Microbial Biofilm Destruction." Cegelski, L.; Lim, J. U.S. Patent No: 9,271,493 (2016).

2. "Production and Use of Phosphoethanolamine Cellulose and Derivatives." Cegelski, L.; Thongsomboon, W. International Patent Application: PCT/US2017/47511 (2017).

3. "Composition and Method for New Antimicrobial Agents with Secondary Mode(s) of Action Provided by Conjugation of an Antimicrobial to a Guanidinium-rich Molecular Transporter." Huttner, M.; Wender, P; Cegelski, L.; Zang, Xiaoyu; Antonoplis, A. Provisional Patent Application: US 62/633, 368 (2018).

TALKS (2008 – PRESENT)

1. "From the Chemical Biology Toolbox: Whole-cell NMR for the Microbiologist." **Washington University Infectious Diseases Seminar Series.** St. Louis, MO. 2/14/08.
2. "Targeting Bacterial Amyloid Assembly and Biofilm Formation." **Annual Meeting of the American Society of Microbiology.** Boston, MA. 6/5/08.
3. "The Biological Chemistry Track at Stanford University." **Howard Hughes Medical Institute Professors Meeting.** Chevy Chase, MD. 6/7/09.
4. "Novel Strategies in Drug Development." **Santa Clara Valley/Northern California Meeting of the American Chemical Society.** South San Francisco, CA. 9/23/10.
5. "The Chemistry and Biology of Bacterial Biofilms." **San Francisco State University.** Department of Chemistry and Biochemistry. 4/29/11.
6. "Probing the Bacterial Cell Surface by Solid-state NMR and Chemical Biology." **Portland State University.** Department of Chemistry. 5/13/11.
7. "Probing the Bacterial Cell Surface by Solid-state NMR and Chemical Biology." **University of California Santa Cruz.** Department of Chemistry and Biochemistry. 5/18/11.
8. "Assembly, Function, and Inhibition of Uropathogenic *E. coli* Amyloid-integrated Biofilms." **Stanford University.** Department of Urology. 9/26/11.
9. "Charting the Landscape of the Bacterial Biofilm Matrix: where Chemical Biology Meets Solid-state NMR." **Wichita State University.** Department of Chemistry. 2/15/12.
10. "Charting the Landscape of the Bacterial Biofilm Matrix: where Chemical Biology Meets Solid-state NMR." **San Jose State University.** Department of Chemistry. 3/13/12.
11. "Sum of the Parts: Bacterial Biofilms by Solid-state NMR." **Samuel I. Weissman Lecture and Symposium. Washington University.** St. Louis, MO. 5/11/12.
12. "Structure and Function of Bacterial Amyloid Fibers and Biofilms." **Rocky Mountain Conference on Analytical Chemistry.** Copper Mountain, CO. 7/17/12.
13. "Structure and Function of Bacterial Amyloid Fibers and Biofilms." **Frontiers of NMR in Biology-Keystone Symposium.** Snowbird, UT. 1/15/13.
14. "Structure and Function of Bacterial Amyloid Fibers and Biofilms." **Biophysical Society Meeting.** Philadelphia, PA. 2/8/13.
15. "Charting the Landscape of the Bacterial Biofilm Matrix: where Chemical Biology Meets Solid-state NMR." **Sixth International Conference on Advanced Materials and Nanotechnology (AMN-6).** Auckland, New Zealand. 2/14/13.
16. "Structure, Function, and Inhibition of Bacterial Biofilms." **Annual Symposium of the Stanford University Center for Molecular Analysis and Design**. Stanford, CA. 5/3/13.
17. "Bacterial Biofilms by Solid-State NMR." **Atomic View of Biomolecular Function. University of Michigan.** Ann Arbor, MI. 7/12/13.
18. "Sum of the Parts: Composition and Architecture of the Bacterial Extracellular Matrix." **GRC: Microbial Adhesion and Signal Transduction.** Salve Regina. Newport, RI. 7/22/13.

19. "Structure, Function, and Inhibition of Bacterial Biofilms." **ISACS11: Challenges in Chemical Biology Conference. MIT.** Boston, MA. 7/24/13.
20. "Sum of the Parts: Composition and Architecture of the Bacterial Extracellular Matrix." **ACS National Meeting.** Indianapolis, IN. 9/8/13.
21. "Sum of the Parts: Composition and Architecture of the Bacterial Extracellular Matrix." **Western Regional ACS Meeting.** Santa Clara, CA. 10/3/13. ***Session organizer and speaker.***
22. "Bacterial Biofilms by Solid-State NMR." **Southwest Regional ACS Meeting.** Waco, TX. 11/19/13.
23. "Structure, Function, and Inhibition of Bacterial Biofilms: Insights from Small Molecules and a Big Magnet." **University of the Pacific.** Department of Chemistry. 1/21/14.
24. "Finding New Antibiotics: Adventures at the Interface of Chemistry and Biology." **Castro Valley Educational Foundation Lecture. Castro Valley Center for the Arts.** Castro Valley, CA. 1/29/14.
25. "Structure, Function, and Inhibition of Bacterial Biofilms: Insights from Small Molecules and a Big Magnet." **Washington University School of Medicine**. Department of Biochemistry. 3/4/14.
26. "Bacterial Biofilms: Mapping the Extracellular Matrix by Solid-State NMR." **Experimental NMR Conference.** Boston, MA. 3/28/14.
27. "Structure, Function, and Inhibition of Bacterial Biofilms: Lessons from Small Molecules and a Big Magnet." **Science at the Edge Seminar Series. Michigan State University.** East Lansing, MI. 4/18/14.
28. "Structure, Function, and Inhibition of Bacterial Biofilms: Lessons from Small Molecules and a Big Magnet." **UC Santa Barbara.** Department of Chemistry. Santa Barbara, CA. 4/30/14.
29. "Rheology of Bacterial Biofilms: A Tale of Two Microbes." **Industrial Partnership for Research in Interfacial and Materials Engineering (IPRIME) Annual Meeting. University of Minnesota.** Minneapolis, MN. 5/27/14.
30. "Structure, Function, and Inhibition of Bacterial Biofilms: Lessons from Small Molecules and a Big Magnet." **University of Minnesota.** Minneapolis, MN. 5/28/14.
31. "Spectral Insights into Composition in Bacterial Cell Walls and Biofilms." **Canadian Society for Chemistry Annual Meeting.** Vancouver, B.C. 6/2/14.
32. "Composition and Bacterial Cell Walls and Biofilms: Insights from Small Molecules and a Big Magnet." **GRC: Bacterial Cell Surfaces.** Mount Snow, Vermont. 6/23/14.
33. "Structure, Function, and Inhibition of Bacterial Biofilms: Lessons from Small Molecules and a Big Magnet." **International Conference on Magnetic Resonance in Biological Systems.** Dallas, Texas. 8/25/14.
34. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **Emory University.** Department of Chemistry. Atlanta, Georgia. 10/6/14.
35. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **UC Berkeley.** Magnetic Resonance Seminar Series. Berkeley, CA. 10/10/14.
36. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **University of Oregon.** Department of Biochemistry. Eugene, OR. 10/17/14.
37. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **MIT.** Department of Chemistry. Boston, MA. 10/27/14.
38. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **Brandeis University.** Department of Chemistry. Boston, MA. 10/28/14.
39. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **University of Illinois Urbana-Champaign.** Department of Biochemistry. Urbana, IL.

5/1/15.

40. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **University of Toronto.** Department of Chemistry. Toronto, Canada. 5/14/15.
41. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **Caltech.** Department of Chemistry. Pasadena, CA. 5/27/15.
42. "Bacterial Biofilms: Lessons from Small Molecules and a Big Magnet." **Montana State University.** Center for Biofilm Engineering. Bozeman, MT. 10/15/15.
43. "Physical and Biochemical Tools for Biofilm Matrix Composition and Function." **7th ASM Conference on Biofilms**. Chicago, IL. 10/27/15.
44. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **University of Washington.** Department of Chemistry. Seattle, WA. 12/2/15.
45. "Spectral Snapshots of Bacterial Cell-Wall Composition and the Influence of Antibiotics by Whole-Cell NMR." **Pacifichem 2015.** Advances in Biological Solid-State NMR. Honolulu, HI. 12/15/15.
46. "Structure, Function, and Inhibition of Bacterial Cell Walls and Biofilms: Lessons from Small Molecules and a Big Magnet." **UC Davis.** Department of Chemistry. Davis, CA. 5/17/16.
47. "Molecular Contributions to *E. coli* Adhesion in the Bladder and Opportunities in Drug Discovery." **Stanford Institute for Immunity, Transplantation and Infection Seed Grant Awards Symposium**. Stanford, CA. 6/1/16.
48. "*E. coli* Extracellular Matrix Components, Inhibitors, and Implications for UTI." **Clinical and Scientific Advances in Urinary Tract Infection**. Columbus, OH. 8/27/16.
49. "Biosynthetic Modification of Cellulose for Improved Cellulose-to-Ethanol Conversion." **Stanford. Precourt Institute Energy Seed Project Annual Workshop**. Stanford, CA. 09/28/16.
50. "Bacterial Cell-Wall and Biofilm Discoveries with Small Molecules and a Big Magnet." **Stanford.** Department of Chemistry. Stanford, CA. 10/4/16.
51. "Entanglements of Art with Science." **The Pill: Chemistry, Art & Art History and the Legacy of Carl Djerassi.** Stanford, CA. 10/20/17.
52. "Biosynthetic Modification of Cellulose for Improved Cellulose-to-Ethanol Conversion." **Stanford. Precourt Institute Energy Advisory Council Meeting.** Stanford, CA. 12/6/16.
53. "Bugs, Films and Leaves." **Celebration Symposium in Honor of Professor Jacob Schaefer. Washington University.** St. Louis, MO. 1/6/17.
54. "Isotopic Labeling and Solid-State NMR Detection Strategies for Intact Plant Leaves, Bacterial Whole Cells and Biofilms." **Advanced Isotopic Labeling Methods for Integrated Structural Biology**. Grenoble, France. 3/6/17.
55. "A Newly Discovered Modified form of Cellulose Produced by *E. coli*: Structure, Biosynthesis, and Implications." **Cellulose Structure and Biosynthesis Symposium. CELL Division of the ACS Meeting**. San Francisco, CA. 4/2/17.
56. "Composition and Architecture in Intact Bacterial Cells, Cell Walls and Biofilms." **Chemical Biophysics Symposium. University of Toronto.** Toronto, CANADA. 5/4/17.
57. "Discoveries in the Bacterial Extracellular Matrix: a Naturally Produced Chemically Modified Cellulose." **3M.** Minnesota, MN. 5/18/17.
58. "Biofilm Structure, Function and Inhibition: Discoveries with Small Molecules and a Big Magnet." **Biofilms: Stuck On You, Biofilm Symposium.** University of Minnesota. Minnesota, MN. 5/19/17.
59. "Composition and Architecture in Intact Bacterial Cells, Cell Walls and Biofilms." **International Society of Magnetic Resonance (ISMAR) Conference**. Quebec City, Canada. 7/25/17.
60. "New Chemistry in Bacterial Biofilms: Discoveries with Small Molecules and a Big Magnet." **Symposium Co-organizer. Transformative Measurements and Experimental Approaches for Bacterial Biofilms. Okinawa Institute of Science and Technology**. Okinawa, Japan. 8/29/17.

61. "Biosynthetic Modification of Cellulose for Improved Cellulose-to-Ethanol Conversion." **Stanford. Precourt Institute Energy Seed Project Annual Workshop**. Stanford, CA. 09/28/17.
62. "Discovery of a Naturally Produced Chemically Modified Cellulose and Implications for Energy Research." **Innovators to Watch. Annual GCEP Symposium. Stanford.** Stanford, CA. 10/18/17.
63. "Targeting Biofilms: Views of *Aspergillus fumigatus* with a Strong Microscope and a Big Magnet." **8th Advances Against Aspergillus Conference.** Lisbon, Portugal. 02/03/18.
64. "Macromolecular and Whole Cell NMR for Biological Discovery." **Biophysical Society Conference**. San Francisco, CA. 02/20/18.
65. "New Views of Bacterial Cell Walls and Biofilms: Discovery at the Chemistry-Biology Interface." **Department of Microbiology, University of Indiana**. Indianapolis, IN. 03/20/18.
66. "New Views of Bacterial Cell Walls and Biofilms." **Department of Chemistry and Chemical Biology, Harvard**. Boston, MA. 04/09/18.
67. "New Views of Bacterial Cell Walls and Biofilms." **59th Experimental NMR Conference**. Orlando, FL. 05/01/18.
68. "New Ways of Looking at Polysaccharides in Bacterial Cell Walls and Biofilms." **FASEB Microbial Glycobiology.** Scottsdale, AZ. 06/20/18.
69. Invited Lecturer and Faculty Participant at "**Frontiers of Biophysics," 16th Course of the International School for Biological Magnetic Resonance**. Erice-Sicily, ITALY. 08/01/18-08/08/18.
70. "New Views of Bacterial Cell Walls and Biofilms." **International Council on Magnetic Resonance in Biological Systems Conference, Founder's Medal Lecture.** Dublin, IRELAND. 08/19/18.
71. "New Chemistry at the Bacterial Cell Surface: Targeting Virulence and Host-Pathogen Interactions." **New York Academy of Sciences Symposium: New Therapeutic Strategies to Target Antibacterial Resistance.** New York, NY. 10/23/18.
72. "New Views of Bacterial Cell Walls and Biofilms." **Department of Chemistry, San Jose State University**. San Jose, CA. 10/18/19.
73. "New Discoveries and New Chemistry at the Bacterial Cell Surface." **Pomona College Science Seminar**. Claremont Colleges, Ontario, CA. 02/12/19.
74. "Cell Walls and Biofilms: Discovery and New Chemistry at the Bacterial Cell Surface." **Molecular Biophysics Discussion Group – Student Invited Speaker, University of Texas Southwestern Medical Center.** Dallas, TX. 02/28/19.
75. "Cell Walls and Biofilms: Discovery and New Chemistry at the Bacterial Cell Surface." **Vanderbilt Institute of Chemical Biology Seminar.** Vanderbilt University. Nashville, TN. 03/27/19.
76. "Cell Walls and Biofilms: Discovery and New Chemistry at the Bacterial Cell Surface." **FDA**. Silver Spring, MD. 05/07/19.
77. "Plowing Time in the Field of Opportunity." **Stanford ChEM-H Postdoc Retreat**. Sonoma, CA. 05/13/19.
78. "Stronger Together: Bacterial Weaving of Functional Amyloid and Polysaccharide Composites to Assemble Multicellular Biofilm Communities." **EuroISMAR, Plenary Lecture**. Berlin, Germany. 08/28/19.
79. "Bacterial Weaving of Functional Amyloid and Polysaccharide Composites to Assemble Multicellular Biofilm Communities." **Institute of Biology/Microbiology, Humboldt University.** Berlin, Germany. 08/29/19.
80. "Entanglements of Art and Science." **Matters of Activity - Cluster of Excellence Seminar, Humboldt University**. Berlin, Germany. 08/30/19.
81. "Discovery and New Chemistry at the Bacterial Cell Surface." **Scientific Oktoberfest - Center for Integrated Protein Science, Technische Universität München.** Munich, Germany. 09/19/19.
82. "Discovery and New Chemistry at the Bacterial Cell Surface." **Department of Chemistry, University of Wisconsin.** Madison, WI. 10/08/19.
83. "Discovery and New Chemistry at the Bacterial Cell Surface." **NSF CAREER Awardees Symposium. Division of Molecular and Cellular Biosciences, NSF.** Alexandria, VA. 10/29/19.
84. "Discovery and New Chemistry at the Bacterial Cell Surface." **UCSD Vold Lecture.** Zoom. 11/05/20.
85. "Discovery and New Chemistry at the Bacterial Cell Surface." **Stanford 2021 Biology-Chemistry Colloquium.** Zoom. 01/19/21.
86. "Solid-state NMR for New Discoveries in Bacterial Whole Cells and Biofilms." **IVAN NMR Symposium at the Annual Experimental NMR Conference.** Zoom. 03/28/21.

87. "Form and Function of Curli Bacterial Amyloid Fibers." **Spring 2021 Meeting of the American Chemical Society**. Zoom. 04/05/21.
88. "Vancomycin Conjugates Yield Extraordinary New Activities against Gram-positive and Gram-negative Bacteria." **ASPET Symposium on Experimental Approaches for the Treatment of Infectious Disease, Annual Meeting of Experimental Biology.** Zoom. 04/27/21.
88. "New Discoveries in Bacterial Polysaccharides and Biofilms." **ISMAR-APNMR Conference**. 08/22/21.
89. "Discovery and New Chemistry at the Bacterial Cell Surface." **13th International Symposium on Lactic Acid Bacteria.** Zoom. 08/23/21.