

**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, <i>summa cum laude</i> 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 <i>summa cum laude</i>	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 <i>Poster</i> : 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**

<b>Postdoctoral Fellow</b> , Washington University School of Medicine, St. Louis, MO; Department of Molecular Microbiology	12/2004 - 2008
<b>Acting Assistant Professor</b> , Stanford University, Stanford, CA; Dept. of Chemistry	2008 - 2009
<b>Assistant Professor</b> , Stanford University, Stanford, CA; Dept. of Chemistry	2009 – 2017
<b>Associate Professor</b> , 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* <sup>13</sup>CO<sub>2</sub> and <sup>15</sup>N Labeling.** *Journal of Biological Chemistry* (2005) 280, 39238-39245.
7. Cegelski L and Schaefer J. **Photorespiration in Intact Leaves by *in vivo* <sup>13</sup>CO<sub>2</sub> 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* <sup>13</sup>C and <sup>15</sup>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 <sup>13</sup>C{<sup>19</sup>F} and <sup>15</sup>N{<sup>19</sup>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*, 3<sup>rd</sup> 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. Saggiu 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 Bryostatins 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, Jacobson 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, Regard 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  $\alpha$ -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 Poly ladderene 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.
75. Wells DH, Goularte NF, Barnette MJ, Cegelski L, Long SR. **Identification of a Novel Pyruvyltransferase using <sup>13</sup>C Solid-state NMR to Analyze Rhizobial Exopolysaccharides.** *Journal of Bacteriology* (2021) 203, e00403-21.
76. Goularte NF, Kallem T, Cegelski L. **Chemical and Molecular Composition of the Chrysalis Reveals Common Chitin-rich Structural Framework for Monarchs and Swallowtails.** *Journal of Molecular Biology* (2022). 434, 167456.

#### 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." **7<sup>th</sup> 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." **Pacificchem 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." **8<sup>th</sup> 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." **59<sup>th</sup> 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, 16<sup>th</sup> 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.
89. "New Discoveries in Bacterial Polysaccharides and Biofilms." **ISMAR-APNMR Conference**. 08/22/21.
90. "Discovery and New Chemistry at the Bacterial Cell Surface." **13th International Symposium on Lactic Acid Bacteria**. Zoom. 08/23/21.