

LYNETTE CEGELSKI
ASSISTANT PROFESSOR OF CHEMISTRY
STANFORD UNIVERSITY
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ACADEMIC HISTORY

SUNY Binghamton, 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 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: REDOR NMR for the Macromolecular Structural Biologist</i>	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

EMPLOYMENT HISTORY

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

PROFESSIONAL ASSOCIATIONS

Member, American Chemical Society

Member, Biophysical Society

Member, American Society of Microbiology

PROFESSIONAL SERVICE

Journal Reviewer: Applied and Environmental Microbiology; Biochemistry; Biophysical Journal; Chemical Science; FEMS Microbiology Letters; Infection and Immunity; Journal of the American Chemical Society (JACS); Journal of Magnetic Resonance; Magnetic Resonance in Chemistry; Nature Methods; PLoS One; PLoS Pathogens; PNAS; Science; Solid-State Nuclear Magnetic Resonance.

Guest Editor: Special Issue on “NMR Spectroscopy for Atomistic Views of Biomembranes and Cell Surfaces” in *Biophysica et Biochimica Acta* (2014).

TEACHING

Introduction to Biochemistry, CHEM 181 (ChemEng 181/281, Bio 188/288)

Biochemistry Laboratory, CHEM 184

Exploring Chemical Research at Stanford, CHEM 111

Introduction to NMR, CHEM 291

PUBLICATIONS

All publications are in peer-reviewed journals; * indicates corresponding author.

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* ¹³CO₂ and ¹⁵N Labeling.** *Journal of Biological Chemistry* (2005) 280, 39238-39245.
7. Cegelski L and Schaefer J*. **Photorespiration in Intact Leaves by *in vivo* ¹³CO₂ 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* ¹³C and ¹⁵N 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 $^{13}\text{C}\{^{19}\text{F}\}$ and $^{15}\text{N}\{^{19}\text{F}\}$ 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, 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, 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, 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, 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, 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*, 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, Cegelski L*. **Curcumin as an Amyloid-Specific Dye.** *Chemical Communications* (2013) 49, 4193-4195.
25. McCrate OA, Zhou X, Reichhardt C, 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, 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. *From the cover.*
29. Saggi M, Carter B, Zhou X, Faries K, Cegelski L, Holten D, Boxer SG, 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, Cegelski L*. **Molecular Determinants of Mechanical Properties of *V. cholerae* Biofilms at the Air-Liquid Interface.** *Biophysical Journal* (2014) 107, 2245-2252. *From the cover.*
31. Reichhardt C, Fong JCN, Yildiz F, 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, 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, Cegelski L*. **Spectral Snapshots of Bacterial Cell-Wall Composition and the Influence of Antibiotics by Whole-Cell NMR.** *Biophysical Journal* (2015) 108, 1380-1389. *Highlighted in Biophysical Journal as a "New and Notable" contribution.*
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. *From the cover.*
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 Rifampentine 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 and 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, 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. Reichhardt C, Stevens DA, Cegelski L*. **Fungal Biofilm Composition and Opportunities in Drug Discovery.** *Future Medicinal Chemistry* (2016) *In press.*
43. 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.** *Submitted.*

PATENTS

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

INVITED LECTURES (2009 – PRESENT)

Santa Clara Valley/Northern California Meeting of the American Chemical Society. South San Francisco, CA. 9/23/10.

Department of Chemistry and Biochemistry, San Francisco State University, 4/29/11.

Department of Chemistry. Portland State University. 5/13/11.

Department of Chemistry and Biochemistry. University of California Santa Cruz. 5/18/11.

Department of Urology. Stanford University. 9/26/11.

Department of Chemistry. Wichita State University. 2/15/12.

Department of Chemistry. San Jose State University. 3/13/12.

Samuel I. Weissman Lecture and Symposium. Washington University. St. Louis, MO. 5/11/12.

Rocky Mountain Conference on Analytical Chemistry. Copper Mountain, CO. 7/17/12.

Frontiers of NMR in Biology-Keystone Symposium. Snowbird, UT. 1/15/13.

Biophysical Society Meeting. Philadelphia, PA. 2/8/13.

Sixth International Conference on Advanced Materials and Nanotechnology (AMN-6). Auckland, New Zealand. 2/14/13.

Annual Symposium of the Stanford University Center for Molecular Analysis and Design. Stanford, CA. 5/3/13.

Atomic View of Biomolecular Function Symposium. University of Michigan. Ann Arbor, MI. 7/12/13.

Gordon Research Conference: Microbial Adhesion and Signal Transduction. Salve Regina. Newport, RI. 7/22/13.

International Symposium on Advancing the Chemical Sciences 11: Challenges in Chemical Biology Conference. MIT. Boston, MA. 7/24/13.

ACS National Meeting. Indianapolis, IN. 9/8/13.

Western Regional ACS Meeting. Santa Clara, CA. 10/3/13. *Session organizer and speaker.*

Southwest Regional ACS Meeting. Waco, TX. 11/19/13.

Department of Chemistry. University of the Pacific. 1/21/14.

Castro Valley Educational Foundation Lecture. Castro Valley Center for the Arts. Castro Valley, CA. 01/29/14.

Department of Biochemistry. Washington University School of Medicine. 4/4/14.

Experimental NMR Conference. Boston, MA. 3/24/14.

Science at the Edge Seminar Series. Michigan State University. East Lansing, MI. 4/18/14.

Department of Chemistry. UC Santa Barbara. Santa Barbara, CA. 4/30/14.

Industrial Partnership for Research in Interfacial and Materials Engineering (IPRIME) Annual Meeting. University of Minnesota. Minneapolis, MN. 5/27/14.

Department of Chemistry. University of Minnesota. Minneapolis, MN. 5/28/14.

Canadian Society for Chemistry Annual Meeting. Vancouver, B.C. 6/2/14.

Gordon Research Conference: Bacterial Cell Surfaces. Mount Snow, Vermont. 6/23/14.

International Conference on Magnetic Resonance in Biological Systems. Dallas, Texas. 8/25/14.

Department of Chemistry. Emory University. Atlanta, Georgia. 10/6/14.

Magnetic Resonance Seminar Series. UC Berkeley. Berkeley, CA. 10/10/14.

Department of Biochemistry. University of Oregon. Eugene, OR. 10/17/14.

Department of Chemistry. MIT. Boston, MA. 10/27/14.

Department of Chemistry. Brandeis University. Boston, MA. 10/28/14.

Department of Biochemistry. University of Illinois Urbana-Champaign. Urbana, IL. 5/1/15.

Department of Chemistry. University of Toronto. Toronto, Canada. 5/14/15.

Department of Chemistry. Caltech. Pasadena, CA. 5/27/15.

Center for Biofilm Engineering. Montana State University. Bozeman, MT. 10/15/15.

7th ASM Conference on Biofilms. Chicago, IL. 10/27/15.

Department of Chemistry. University of Washington. Seattle, WA. 12/2/15.

Advances in Biological Solid-State NMR. Pacificchem. Honolulu, HI. 12/15/15.

Department of Chemistry. UC Davis. Davis, CA. 5/17/16.

Seed Grant Awards Symposium. Stanford Institute for Immunity, Transplantation and Infection. Stanford, CA. 6/1/16.

Clinical and Scientific Advances in Urinary Tract Infection. Columbus, OH. *Upcoming* 8/27/16.