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Education:

Ph.D. Washington University School of Medicine,

Molecular Biophysics program in Division of Biology and Biomedical Sciences, St. Louis MO, 2004

Ph.D. Mentor: Jacob Schaefer in the Department of Chemistry.

B.S. Calvin College (Physics major, math minor) Grand Rapids MI, 1992.

Profession Experience:

2018–Present Assistant Professor, Department of Chemistry, Howard University.

2011–2018 Assistant Professor, Department of Chemistry & Biochemistry, Baylor University.

2006–2011 Research Associate, Department of Chemistry, Washington University in St. Louis

2004–2006 Postdoctoral Associate, Department of Chemistry, Washington University in St. Louis.

Publications:

(graduate students are underlined and undergraduate students are marked with a star.)

1. Rimal B., Senzani S., Ealand C., Lamichhane G., Kana B., and **Kim SJ.** (2022) Peptidoglycan compositional analysis of *Mycobacterium smegmatis* using high-resolution LC-MS. Scientific Reports 12, 11061. <https://doi.org/10.1038/s41598-022-15324-1>.
2. Olademehin O., Shuford K., and **Kim SJ.** (2022) Molecular dynamics simulation of the secondary-binding site in disaccharide-modified glycopeptide antibiotics. Scientific Reports 12, 7087. <https://doi.org/10.1038/s41598-022-10735-6>.
3. Olademehin O., **Kim SJ.**, and Shuford K. (2021) Molecular dynamics simulation of atomic interactions in the vancomycin binding site. ACS OMEGA 6, 775-785; <https://doi.org/10.1021/acsomega.0c05353>.
4. Olademehin O., Liu C., Rimal B., Adegboyega N., Chen F., Sim C., and **Kim SJ.** (2020) Dsi-RNA injection targeting genes regulated by Foxo transcription factor reduce glycogen and lipid storage in diapause *Culex pipiens*. Scientific Reports 10, 17201; doi.org/10.1038/s41598-020-74292-6.
5. King B., Li L., Liu C., **Kim SJ.**, and Sim C. (2020) Suppression of glycogen synthase expression reduces glycogen and lipid storage during mosquito overwintering diapause, Journal of Insect Physiology, Vol. 120 <https://doi.org/10.1016/j.jinsphys.2019.103971>.
6. Pidgeon S., Apostolos, A., Nelson J., Shaku M., Rimal B., Islam N., Crick D., **Kim SJ.**, Pavelka M., Kana B., and Pires M. (2019) L,D-transpeptidase specific probe reveals spatial activity of peptidoglycan crosslinking, ACS Chem. Bio., <https://doi.org/10.1021/acschembio.9b00427>. Highlighted in Faculty of 1000 (<https://f1000.com/prime/736558771>).
7. Chang J., Wallace A.*, Foster E.*, and **Kim SJ.** (2018) Peptidoglycan compositional analysis of *Enterococcus faecalis* biofilm by stable isotope labeling by amino acids in bacterial culture, Biochemistry, Jan 25, 2018, DOI: 10.1021/acs.biochem.7b01207.
8. Wang F., Zhou H., Olademehin, O., **Kim SJ.**, and Tao P. (2018) Insights into key interactions between vancomycin and bacteria cell wall structure, ACS Omega, 3(1): 37-45.

9. Srivastava D., Seo J., Rimal B., **Kim SJ.**, Zhen S., and Darwin A. (2018) A proteolytic complex targets multiple cell wall hydrolases in *Pseudomonas aeruginosa*. mBio, DOI: 10.1128/mBio.00972-18
10. Ealand C., Rimal B., Chang J., Mashigo L., Chengalroyen M., Mapela L., Beukes G., Machowski E., **Kim SJ.**, and Kana B. (2018) Resuscitation promoting factors are required for biofilm formation in *Mycobacterium smegmatis*. Applied and Environmental Microbiology, DOI: 10.1128/AEM.00687-18.
11. **Kim SJ.**, Chang J., Rimal B., Hao Y., and Schaefer J. (2017) Surface proteins and the formation of biofilm by *Staphylococcus aureus*, Biochimica et Biophysica Acta (Biomembrane), Vol. 1860 (3): 749-756.
12. Yang H., Singh M., **Kim SJ.**, and Schaefer J. (2017) Characterization of the tertiary structure of the peptidoglycan of *Enterococcus faecalis*. Biochimica et Biophysica Acta Biomembrane, 1859 (11): 2171-2180. PMID: 28784459 PMCID: PMC5610627
13. Chang J., Foster E.*, Thadani A.*, Ramirez A., and **Kim SJ.** (2017) Inhibition of *Staphylococcus aureus* cell wall biosynthesis by desleucyl-oritavancin: a quantitative peptidoglycan composition analysis by mass spectrometry. Journal of Bacteriology, 199 (15): e00278-17. PMCID: PMC5512225
14. Chang J., Coffman L.*, and **Kim SJ.** (2017) Inhibition of D-Ala incorporation into wall teichoic acid biosynthesis in *Staphylococcus aureus* by desleucyl-oritavancin. Chemical Communications, 53, 5649 – 5652. PMCID: PMC5512289
15. Senzani S., Li D., Ealand C., Chang J., Rimal B., Liu C., **Kim SJ.**, Dhar N., and Kana B. (2017) An Amidase_3 domain-containing N-acetylmuramyl-L-alanine amidase is required for mycobacterial cell division. Scientific Reports 7, 1140; doi:10.1038/s41598-017-01184-7.
16. Chang J., Foster E.*, Wallace A.*, and **Kim SJ.** (2017) Peptidoglycan O-acetylation increases in response to vancomycin treatment in vancomycin-resistant *Enterococcus faecalis*. Scientific Reports 7, 46500; doi:10.1038/srep46500.
17. Singh M., Chang J., Coffman L.*, and **Kim SJ.** (2017) A hidden mode of action for glycopeptide antibiotics: Inhibition of wall teichoic acid biosynthesis. The Journal of Physical Chemistry B, 121 (16): 3925–3932.
18. **Kim SJ.**, Singh M., Sharif S., and Schaefer J. (2017) Desleucyl-oritavancin with a damaged D-Ala-D-Ala binding site inhibits the transpeptidation step of cell-wall biosynthesis in whole cells of *Staphylococcus aureus*. Biochemistry, Vol. 56 (10): 1529–1535.
19. O'Connor R., Singh M., Chang J., **Kim SJ.**, VanNieuwenhze M., and Schaefer J. (2017) Dual mode of action for plusbacin A3 in *Staphylococcus aureus*. The Journal of Physical Chemistry B, 121 (7): 1499-1505.
20. Chang J., Foster E.*, Yang H., and **Kim SJ.** (2017) Quantification of D-Ala-D-Lac terminated peptidoglycan structure in vancomycin-resistant *Enterococcus faecalis* using a combined solid-state NMR and mass spectrometry analysis. Biochemistry, Vol. 56 (4): 612-622.
21. Chang J., Singh M., Kim S., Hockaday W., Sim C., and **Kim SJ.** (2016) Solid-state NMR reveals differential carbohydrate utilization in diapausing *Culex pipiens*. Scientific Reports, 6: 37350 doi: 10.1038/srep37350.
22. Chang J., Zhou H., Preobrazhenskaya M., Tao P., and **Kim SJ.** (2016) The carboxyl-terminus of eremomycin facilitates binding to the non-D-Ala-D-Ala segment of the peptidoglycan pentapeptide stem. Biochemistry, Vol. 55 (24): 3383-3391.
23. Singh M., Chang J., Coffman L.* and **Kim SJ.** (2016) Solid-state NMR characterization of amphomycin effects on peptidoglycan and wall teichoic acid biosyntheses in *Staphylococcus aureus*. Scientific Reports, 6: 31757, doi:10.1038/srep31757
24. Karunathilake A, Chang J., Thompson C, Nguyen C, Nguyen D, Rajan A, Sridharan, Vyakaranam M, Adegboyega N, **Kim SJ.**, and Smaldone R. (2016) Hexaphenylbenzene and hexabenzocoronene-based

- porous polymers for the adsorption of volatile organic compound. RSC Advances, Vol. 6: 65763-65769. (shared corresponding author)
25. Kim SK, Demuth M, Schlesinger, SR, **Kim SJ**, Urbanczyk J, Shaw RW, Choi SK, Lee D, and Shin H. (2016) Inhibition of *Bacillus anthracis* Metallo- β -lactamase by Compounds with Hydroxamic Acid Functionality. Journal of Enzyme Inhibition and Medicinal Chemistry, Vol. 31 (4):132-137
 26. **Kim SJ.**, Chang J., and Singh M. (2015) Peptidoglycan architecture of Gram-positive bacteria by solid-state NMR. Biochimica et Biophysica Acta (BBA)-Biomembranes, Vol. 1848 (1): 350-362. (Kim JS is the corresponding author.)
 27. Singh M., **Kim SJ.**, Sharif S., Preobrazhenskaya M., and Schaefer J. (2015) REDOR constraints on the peptidoglycan lattice architecture of *Staphylococcus aureus*. Biochimica et Biophysica Acta (BBA)-Biomembranes, Vol. 1848 (1): 363-368.
 28. **Kim SJ.**, Singh M., Sharif S., and Schaefer J. (2014) Cross-link formation and peptidoglycan lattice assembly in the FemA mutant of *Staphylococcus aureus*. Biochemistry, Vol. 53 (9): 1420-1427.
 29. **Kim SJ.**, Singh M., Preobrazhenskaya M., and Schaefer J. (2013) *Staphylococcus aureus* peptidoglycan stem packing by rotational-echo double resonance NMR spectroscopy. Biochemistry, 52 (21): 3651-3659 (*Highlighted in Biochemistry*).
 30. **Kim SJ.**, Tanaka K. S. E., Dietrich E., Rafai Far, A., and Schaefer J. (2013) Locations of the hydrophobic side chains of lipoglycopeptides bound to the peptidoglycan of *Staphylococcus aureus*. Biochemistry, 52 (20): 3405-3414.
 31. **Kim SJ.**, Singh M., Wohlrab A., Yu T., Patti G., O'Connor R. D., VanNieuwenhze M., and Schaefer J. (2013) Isotridecanyl side chain of plusbacin-A₃ is essential for the transglycosylase inhibition of peptidoglycan biosynthesis. Biochemistry, 52 (11): 1973-1979.
 32. Sharif S., **Kim SJ.**, Labischinski H., and Schaefer J. (2013) Uniformity of glycyI bridge lengths in the mature cell walls of Fem mutants of methicillin-resistant *Staphylococcus aureus*, Journal of Bacteriology, 195 (7) 1421-1427.
 33. **Kim SJ.**, Singh M., and Schaefer J. (2009) Oritavancin binds to isolated protoplast membranes but not intact protoplasts of *Staphylococcus aureus*, Journal of Molecular Biology 391: 414-425. Highlighted in Faculty of 1000 (www.f1000biology.com/article/id/1163212/evaluation).
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 36. Sharif S., **Kim SJ.**, Labischinski H., and Schaefer J. (2009) Characterization of peptidoglycan in Fem-deletion mutants of methicillin-resistant *Staphylococcus aureus* by solid-state NMR, Biochemistry, 48: 3100-3108.
 37. **Kim SJ.**, and Schaefer J. (2008) Hydrophobic side-chain length determines activity and conformational heterogeneity of a vancomycin derivative bound to the cell wall of *Staphylococcus aureus*, Biochemistry 47: 10155-10161.
 38. **Kim SJ.**, Matsuoka S., Patti G., and Schaefer J. (2008) Vancomycin derivative with damaged D-Ala-D-Ala binding cleft binds to cross-linked peptidoglycan in the cell wall of *Staphylococcus aureus*, Biochemistry 47: 3822-3831.
 39. Patti G., **Kim SJ.**, and Schaefer J. (2008) Characterization of the peptidoglycan of vancomycin-susceptible *Enterococcus faecium*, Biochemistry 47: 8378-8385.

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41. **Kim SJ.**, Cegelski L., Preobrazhenskaya M. N., and Schaefer J. (2006) Structures of *Staphylococcus aureus* cell-wall complexes with vancomycin, eremomycin, and chloroeremomycin derivatives by $^{13}\text{C}\{^{19}\text{F}\}$ and $^{15}\text{N}\{^{19}\text{F}\}$ rotational-echo double resonance, *Biochemistry* 45: 5235-5250.
42. Toke O., Maloy L., **Kim SJ.**, Blazyk J., and Schaefer J. (2004) Secondary structure and lipid contact of a peptide antibiotic in phospholipid bilayers by REDOR, *Biophysical Journal* 87: 662-674.
43. **Kim SJ.**, Cegelski L., Studelska D. R., O'Connor B., Mehta A., and Schaefer J. (2002) Rotational-echo double resonance characterization of vancomycin binding sites in *Staphylococcus aureus*, *Biochemistry* 41: 6967-6977.
44. Cegelski L., **Kim SJ.**, Hing A. W., Studelska D. R., O'Connor B., Mehta A., and Schaefer J. (2002) Rotational-echo double resonance characterization of the effects of vancomycin on cell wall synthesis in *Staphylococcus aureus*, *Biochemistry* 41: 13053-13058.
45. **Kim SJ.**, Cegelski L., Studelska D. R., O'Connor B., Mehta A., and Schaefer J. "REDOR characterization of vancomycin binding sites in *S. aureus*". Abstract published in *Journal of Biophysics* 82: 469 (2002).
46. Cegelski L., **Kim SJ.**, Hing AW, Studelska D. R., O'Connor B., Mehta A., and Schaefer J. "REDOR characterization of the effects of vancomycin on cell-wall synthesis in *S. aureus*". Abstract published in *Journal of Biophysics* 82: 468 (2002).
47. Grant G., **Kim SJ.**, Xu X. L., and Hu Z. (1999) The contribution of adjacent subunits to the active sites of D-3-phosphoglycerate dehydrogenase, *Journal of Biological Chemistry* 274: 5357-5361.
48. **Kim SJ.**, Lee S. A., Carter B. J., and Rupprecht A. (1996) Stabilization of the B conformation in unoriented films of calf thymus DNA by NaCl: A Raman and IR study, *Biopolymers* 41: 233-238.
49. Mayeres C. H., Lee S. A., Pinnick D. A., Carter B. J., and **Kim SJ.** (1995) A study of Na-DNA films containing NaCl via scanning electron and tunneling microscopies, *Biopolymers* 36: 669-673.

Manuscripts in preparation:

50. Chang J., Ramirez R.*, Guinn A.*, Rimal B., Liu C., Foster E.*, Coffman L.*, Wallace A.*, Thadani A.*, and **Kim SJ.** Peptidoglycan composition of vancomycin-resistant *Staphylococcus aureus* strain VRS4 by LC-MS.
51. Rimal B., Liu C., Chang J., Zechmann B., and **Kim SJ.** Energy dispersive X-ray spectroscopic analysis of *Staphylococcus aureus* biofilm.

A complete list of my publications is available at [NICB](#), [Google Scholar](#), and [ORCID https://orcid.org/0000-0002-2007-6606](https://orcid.org/0000-0002-2007-6606).

Professional Affiliations

- American Society for Microbiology
- Genetic Society of America
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- Korean-American Scientists and Engineers Association