

Ming C. Hammond – Curriculum Vitae

ACADEMIC APPOINTMENTS

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|------------------------------|--|
| <i>Jul 2021 – current</i> | Professor Department of Chemistry Henry Eyring Center for Cell & Genome Science University of Utah |
| <i>July 2018 – June 2021</i> | Associate Professor Department of Chemistry Henry Eyring Center for Cell & Genome Science University of Utah |
| <i>2009 – 2018</i> | Assistant Professor Department of Chemistry Department of Molecular & Cell Biology University of California, Berkeley |

OTHER AFFILIATIONS

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|-----------------------|---|
| <i>2020 – current</i> | Co-Director, UoU Beckman Scholar Program, College of Science, University of Utah |
| <i>2019 – current</i> | Co-Director, NSF Research Experiences for Undergraduate Program, Department of Chemistry, University of Utah |
| <i>2018 – current</i> | Executive Committee Member, Henry Eyring Center for Cell and Genome Science, University of Utah |
| <i>2018 – current</i> | Biological Chemistry Graduate Program, University of Utah |
| <i>2011 – 2019</i> | Faculty Scientist, Physical Biosciences Division, Lawrence Berkeley National Laboratory (LBNL) |
| <i>2009 – 2018</i> | California Institute for Quantitative Biosciences (QB3), UC Berkeley |
| <i>2011 – 2018</i> | Synthetic Biology Institute (SBI), UC Berkeley |
| <i>2012 – 2017</i> | NIGMS Center for RNA Systems Biology (CRSB), UC Berkeley |

EDUCATION AND TRAINING

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|--------------------|---|
| <i>2005 - 2009</i> | Postdoctoral Research Fellow, Molecular Biology Yale University, New Haven, CT BWF CASI Postdoctoral Fellow (<i>Jan 2008 - June 2009</i>) |
| <i>Summer 2008</i> | Visiting Scientist at Heidelberg Institute of Plant Science Heidelberg University, Heidelberg, Germany |
| <i>2000 - 2005</i> | Ph.D., Chemistry (<i>May 2005</i>) University of California, Berkeley, CA HHMI Predoctoral Fellow (<i>Aug 2000 - May 2005</i>) |
| <i>1996 - 2000</i> | Bachelor of Science with Honors, Chemistry (<i>June 2000</i>) California Institute of Technology, Pasadena, CA Beckman Scholar (<i>June 1998 - Sept 1999</i>) |

HONORS AND AWARDS

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|--------------------|--|
| <i>2016</i> | Women in Science Award, Chau Hoi Shuen Foundation |
| <i>2011 - 2016</i> | National Institutes of Health New Innovator Award |
| <i>2011</i> | Regents' Junior Faculty Fellowship (UC Berkeley) |
| <i>2010 - 2013</i> | Chevron Chair of Chemistry (UC Berkeley) |
| <i>2010</i> | Thieme Chemistry Journal Award |
| <i>2008 - 2016</i> | Burroughs Wellcome Fund Career Award at the Scientific Interface |

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|-------------|---|
| 2000 - 2005 | Howard Hughes Medical Institute Predoctoral Fellowship |
| 2000 | National Science Foundation Graduate Fellowship (declined) |
| 2000 | Richard P. Schuster Memorial Prize in Chemistry |
| 1999 - 2000 | Carnation Merit Award - full merit scholarship (Caltech) |
| 1999 | Arie J. Haagen-Smit Memorial Award - Chemistry department award |
| 1998 - 1999 | Beckman Scholar Fellowship |
| 1998 - 1999 | Caltech Prize Award - full merit scholarship |

PUBLICATIONS (corresponding authors are in bold)

49. Tan, Z. *, Chan, C. H. *, Maleska, M., Jara Banuelos, B., Lohman, B. K., Ricks, N. J., **Bond, D. R., Hammond, M. C.** "The signaling pathway that cGAMP riboswitches found: analysis and application of riboswitches to study cGAMP signaling in *Geobacter sulfurreducens*" *Int J Mol Sci* (2022) 23, 1183. 10.3390/ijms23031183
48. Manna, S. *, Truong, J. *, **Hammond, M. C.** "Guanidine biosensors enable comparison of cellular turn-on kinetics of riboswitch-based biosensor and reporter" *ACS Synthetic Biology* (2021) 10, 566. 10.1021/acssynbio.0c00583.
Related Highlights: Cover article, Mar 2021 issue
47. Manna, S., Kellenberger, C. A., Hallberg, Z. F., **Hammond, M. C.** "Live cell imaging using riboswitch-spinach tRNA fusions as metabolite-sensing fluorescent biosensors" *Methods Mol Bio* (2021) 2323, 121. (Invited Chapter)
46. **Palmer, A. E., Hammond, M. C.** "Editorial overview: Molecular imaging" *Curr Opin Chem Biol* (2020) 57, A5-A7.
Related Highlights: Co-editor of annual issue on Molecular Imaging
45. Kitto, R. Z. *, Dhillon, Y. *, Bevington, J. et. al. **Welch, C., McKay, C. P., Hammond, M. C.** "Synthetic biological circuit tested in spaceflight" *Life Sci Space Res* (2020) 28, 57-65.
44. Kitto, R. Z., Christiansen, K. E., **Hammond, M. C.** "RNA-based fluorescent biosensors for live cell detection of bacterial sRNA" *Biopolymers* (2020) e23394. (Invited Paper)
43. Yao, L., Fin A., Rovira, A. R., Su, Y., Dippel, A. B., Valderrama, J. A., Riestra, A. M., Nizet, V., Hammond, M. C., **Tor, Y.** "Tuning the innate immune response to cyclic dinucleotides using atomic mutagenesis" *ChemBioChem* (2020) 21, 2595-2598.
42. Anderson, W. A., Dippel, A. B., Maiden, M. M., Waters, C., **Hammond, M. C.** "Chemiluminescent sensors for quantitation of the bacterial second messenger cyclic di-GMP" *Methods in Enzymology* (2020) 640, 83-104. (Invited Chapter)
41. Su, Y. and **Hammond, M. C.** "RNA-based fluorescent biosensors for live cell imaging of small molecules and RNAs" *Curr Opin Biotech* (2020) 63, 157-166. (Invited Review)
40. Dippel, A. B. *, Anderson, W. A. *, Park, J. H., Yildiz, F. H., **Hammond, M. C.** "Development of ratiometric bioluminescent sensors for *in vivo* detection of bacterial signaling" *ACS Chem Biol* (2020) 15, 904-914.
39. Wright, T. A., Jiang, L., Park, J., Anderson, W. A., Chen, G., Hallberg, Z.F., Nan, B., **Hammond, M. C.** "Second messengers and divergent HD-GYP enzymes regulate 3', 3'-3',3'-cGAMP signaling" *Mol Microbiol* (2020) 113, 222-236.
38. Wright, T. A., Dippel, A. B., **Hammond, M. C.** "Cyclic di-GMP signaling gone astray: cGAMP signaling via Hypr GGDEF and HD-GYP enzymes" In Chou, S.-H., Guillian, N., Lee, V., Romling, U. (ed), *Microbial Cyclic Di-Nucleotide Signaling*. (Invited Book Chapter)
37. Dippel, A. B., **Hammond, M. C.** "A pox on both of your houses: Poxviruses degrade the immune signal cGAMP" *Biochemistry* (2019) 58, 2387-2388. (Invited Viewpoint)
36. Hallberg, Z. F. *, Chan, C. H. *, Wright, T. A., Kranzusch, P. J., Doxzen, K. W., Park, J. J., **Bond, D. R., Hammond, M. C.** "Structure and mechanism of a Hypr GGDEF enzyme

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that activates cGAMP signaling to control extracellular metal respiration” *ELife* (2019) e43959.

Related Highlights: Chosen by editors to be featured in *ELife Science Digest*

35. Villa, J. *, Su, Y. *, **Contreras, L. M., Hammond, M. C.** “Synthetic biology of small RNAs and riboswitches” in *Regulating with RNA in Bacteria and Archaea*, Ed. Gisela Storz, Ed. Kai Papenfort, ASM Press, 2019, 527-545. (*Invited Book Chapter*)
34. Dippel, A. B., Anderson, W. A., Evans, R. S., Deutsch, S., **Hammond, M. C.** “Luminescent biosensors for detection of second messenger cyclic di-GMP” *ACS Chem Biol* (2018) *13*, 1872-1879. (*Invited Paper*)
Related Highlights: “Sensors” special issue in honor of Roger Tsien; *Nat Chem Biol* research highlight; *JGI* science highlight
33. Truong, J., Hsieh, Y. F., Jia, G., **Hammond, M. C.** “Circular permutation strategies for engineering RNA-based fluorescent biosensors”, *Methods* (2018) *143*, 102-109. (*Invited Paper*)

Publications above were published after move to University of Utah (July 2018)

32. Yeo, J., Dippel, A. B., Wang, X. C., **Hammond, M. C.** “In Vivo Biochemistry: Single-cell dynamics of cyclic di-GMP in *E. coli* in response to zinc overload” *Biochemistry* (2018) *57*, 108-116. (*Invited Paper*)
Related Highlights: “Future of Biochemistry” special issue
31. Yeo, J., Wang, X. C., **Hammond, M. C.** “Live flow cytometry analysis of c-di-GMP levels in single cell populations” *Methods Mol Biol* (2017) *1657*, 111-130. (*Invited Book Chapter*)
30. Hallberg, Z. F., Su, Y., Kitto, R., **Hammond, M. C.** “Engineering and in vivo applications of riboswitches” *Annual Rev Biochem* (2017) *86*, 515-539. (*Invited Review*)
29. Bose, D. *, Su, Y. *, Marcus, A., Raulet, D. H., **Hammond, M. C.** “An RNA-based fluorescent biosensor for high-throughput analysis of the cGAS-cGAMP-STING pathway” *Cell Chem Biol* (2016) *23*, 1539-1549.
28. Wang, X. C., Wilson, S. C., **Hammond, M. C.** “Next-generation RNA-based fluorescent biosensors enable anaerobic detection of cyclic di-GMP” *Nucleic Acids Res* (2016) *44*, e139.
27. Su, Y., Hickey, S. F., Keyser, S. G. L., **Hammond, M. C.** “In vitro and in vivo enzyme activity screening via RNA-based fluorescent biosensors for S-adenosyl-L-homocysteine (SAH)” *J Am Chem Soc* (2016) *138*, 7040-7047.
26. Hallberg, Z. F., Wang, X. C., Wright, T. A., Nan, B., Ad, O., Yeo, J., **Hammond, M. C.** “Hybrid promiscuous (Hypr) GGDEF enzymes produce cyclic AMP-GMP (3', 3'-cGAMP)” *Proc Natl Acad Sci* (2016) *113*, 1790-1795.
Related Highlights: Faculty of 1000 recommended article
25. Muller, R. Y., Hammond, M. C., Rio, D. C., **Lee, Y. J.** “An efficient method for electroporation of small interfering RNAs (siRNAs) into ENCODE Project Tier 1 GM12878 and K562 cell lines” *J Biomol Techniques* (2015) *26*, 142-149.
24. Gonzalez, T. L., Liang, Y., Nguyen, B., Staskawicz, B. J., Loque, D., **Hammond, M. C.** “Tight regulation of plant immune responses by combining promoter and suicide exon elements” *Nucleic Acids Res* (2015) *43*, 7152-7161.
23. Kellenberger, C. A., Sales-Lee, J., Pan, Y., Gassaway, M. M., Herr, A. E., **Hammond, M. C.** “A minimalist biosensor: quantitation of cyclic di-GMP using the conformational change of a riboswitch aptamer” *RNA Biol* (2015) *12*, 1189-1197.
22. Kellenberger, C. A. *, Chen, C. *, Whiteley, A. T., Portnoy, D. A., **Hammond, M. C.** “RNA-based fluorescent biosensors for live cell imaging of second messenger cyclic di-AMP” *J Am Chem Soc* (2015) *137*, 6432-6435.

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21. Ren, A., Wang, X. C., Kellenberger, C. A., Rajashankar, J. R., Jones, R., **Hammond, M. C., Patel, D. J.** "Structural basis for molecular discrimination by a 3', 3'-cGAMP sensing riboswitch" *Cell Reports* (2015) 11, 1-12.
20. Kellenberger, C. A.*, Wilson, S. C.*, Hickey, S. F., Gonzalez, T. L., Su, Y., Hallberg, Z. F., Brewer, T. F., Iavarone, A. T., Carlson, H. K., Hsieh, Y. F., **Hammond, M. C.** "GEMM-I riboswitches from *Geobacter* sense the bacterial second messenger c-AMP-GMP" *Proc Natl Acad Sci* (2015) 112, 5383-5388.
Related Highlights: Signaling Breakthroughs of the Year, *Science Signaling*
19. Kellenberger, C. A., Hallberg, Z. F., **Hammond, M. C.** "Live cell imaging using riboswitch-Spinach tRNA fusions as metabolite-sensing fluorescent biosensors" *Methods Mol Biol* (2015) 1316, 87-103. (*Invited Book Chapter*)
18. Kellenberger, C. A., **Hammond, M. C.** "In vitro analysis of riboswitch-Spinach aptamer fusions as metabolite-sensing fluorescent biosensors" *Methods Enz* (2015) 550, 147-172. (*Invited Book Chapter*)
17. Pan, Y., Duncombe, T. A., Kellenberger, C. A., Hammond, M. C., **Herr, A. E.** "High-throughput electrophoretic mobility shift assays for quantitative analysis of molecular binding reactions" *Anal Chem* (2014) 86, 10357-10364.
16. Wilson, S. C., Cohen, D. T., **Hammond, M. C.** "A neutral pH thermal hydrolysis method for quantification of structured RNAs" *RNA* (2014) 20, 1153-1160.
15. Hickey, S. F., **Hammond, M. C.** "Structure-guided design of fluorescent S-adenosyl-methionine analogs for a high-throughput screen to target SAM-I riboswitch RNAs" *Chem Biol* (2014) 21, 345-356.
14. Sadhu, M. J., Guan, Q., Sales-Lee, J., Iavarone, A. T., Hammond, M. C., Cande, W. Z., **Rine, J.** "Nutritional control of epigenetic processes in yeast and human cells" *Genetics* (2013) 195, 831-844.
13. Diner, E. J., Burdette, D. L., Wilson, S. C., Monroe, K. M., Kellenberger, C. A., Hyodo, M., Hayakawa, Y., **Hammond, M. C., Vance, R. E.** "The innate immune DNA sensor cGAS produces a noncanonical cyclic dinucleotide that activates human STING" *Cell Rep* (2013) 3, 1355-1361.
12. Leppek, K., Schott, J., Reitter, S., Poetz, F., Hammond, M. C., **Stoecklin, G.** "Roquin promotes constitutive mRNA decay via a conserved class of stem-loop recognition motifs" *Cell* (2013) 153, 869-881.
11. Kellenberger, C. A., Wilson, S. C., Sales-Lee, J., **Hammond, M. C.** "RNA-based fluorescent biosensors for live cell imaging of second messengers cyclic di-GMP and cyclic AMP-GMP" *J Am Chem Soc* (2013) 135, 4906-4909.
10. Karns, K., Vogan, J. M., Qin, Q., Hickey, S. F., Wilson, S. C., **Hammond, M. C., Herr, A. E.** "Microfluidic screening of electrophoretic mobility shifts elucidates riboswitch binding function" *J Am Chem Soc* (2013) 135, 3136-3143.
9. Hickey, S. F., Sridhar, M., Westermann, A. J., Qin, Q., Vijayendra, P., Liou, G., **Hammond, M. C.** "Transgene regulation in plants by alternative splicing of a suicide exon" *Nucleic Acids Res* (2012), 40, 4701-10.
Related Highlights: Featured Article (top 5%), *Nucleic Acids Res*
8. **Hammond, M. C.** "A tale of two riboswitches" *Nat Chem Biol* (2011), 7, 342-343. (*Commentary*)
7. Meyer, M. M., Hammond, M. C., Salinas, Y., Roth, A., Sudarsan, N., **Breaker, R. R.** "Challenges of ligand identification for riboswitch candidates" *RNA Biol* (2011), 8, 5-10.
6. Block, K. F., Hammond, M. C., **Breaker, R.R.** "Evidence for widespread gene control function by the *ydaO* riboswitch candidate" *J Bacteriol* (2010), 192, 3983-3989.

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5. Hammond, M. C., Wachter, A., **Breaker, R. R.** “A plant 5S rRNA mimic regulates alternative splicing of transcription factor IIIA pre-mRNAs” *Nat Struct and Mol Biol* (2009), *16*, 541-549.
4. Weinberg, Z., Regulski, E. E., Hammond, M. C., Barrick, J. E., Yao, Z., Ruzzo, W. L., **Breaker, R. R.** “The aptamer core of SAM-IV riboswitches mimics the ligand-binding site of SAM-I riboswitches” *RNA* (2008), *14*, 822-828.
3. Hammond, M. C., **Bartlett, P. A.** “Synthesis of amino acid-derived cyclic acyl amidines for use in beta-strand peptidomimetics” *J Org Chem* (2007), *72*, 3104-3107.
2. Hammond, M. C., Harris, B. Z.; Lim, W. A., **Bartlett, P. A.** “Beta-strand peptidomimetics as potent PDZ ligands” *Chem Biol* (2006), *13*, 1247-1251.
1. Sudarsan, N.*, Hammond, M. C.*, Block, K. F., Welz, R., Barrick, J. E., Roth, A., **Breaker, R. R.** “Tandem riboswitch architectures exhibit complex gene control functions” *Science* (2006), *314*, 300-304. ***co-first authors**

PATENTS AND PATENT APPLICATIONS

Hammond, M. C., Wright, T. A. “Methods of producing cyclic dinucleotides” US Pat Appl 62/438,126 (filed 2016)

Hammond, M. C., Su, Y., Bose, D. “Fluorescent biosensor for 2', 3'-cGAMP” US Pat Appl 62/349,556 (filed 2016)

Related Highlights: Material transfer agreement to potential licensees

Biosensor technology team endorsed for national I-CORPS program and \$50K grant

Hammond, M. C., Su, Y., Keyser, S. G. L., Hickey, S. F. “A fluorescent biosensor for high throughput screening of methyltransferase activity” US Pat Appl 62/246,953 (filed 2015)

Related Highlights: Material transfer agreement to potential licensees

Vance, R. E., Hammond, M. C., Burdette, D., Diner, E. J., Wilson, S. C. “Cyclic di-nucleotide induction of type I interferon” US Pat Appl 14/268,967 (filed 2014)

Related Highlights: Licensed, patent royalties to UC Berkeley

Hammond, M. C., Westermann, A. J., Qin, Q. “A P5SM suicide exon for regulating gene expression” U.S. Patent 13/747,395 (filed 2013)

Bartlett, P. A., Hammond, M. C. "Peptide beta-strand mimics based on pyridinones, pyrazinones, pyridazinones, and triazinones" US Pat Appl Publ (2005).

INVITED SEMINAR LECTURES (* are scheduled, underlined are international)

79. * John Innes Centre (Norwich, England), May 2022

78. Bristol Myers Squibb (virtual), Feb 2022

77. Rutgers University, Department of Chemistry and Chemical Biology (virtual), Feb 2022

76. University of Utah, Department of Biomedical Engineering (virtual), Dec 2021

75. University of Utah, School of Biology, Dec 2021

74. University of California, Riverside (virtual), Oct 2021

73. University of Utah, Department of Chemistry (virtual), May 2021

72. Ludwig-Maximilians University, Munich (virtual), April 2021

71. University of California, San Diego (**student-invited**, virtual), Dec 2020

70. Northwestern University (**student-invited**), Mar 2020

69. Google X, Oct 2019

68. New England Biolabs, Oct 2019

67. University of Utah, April 2019

66. Concordia University (Montreal, Canada), Jan 2019

65. INRS (Montreal, Canada), Jan 2019

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64. University of Utah, Oct 2018
63. Pfizer La Jolla, Sept 2018
- Seminars above given after move to University of Utah (July 2018)**
62. University of Minnesota, April 2018
61. San Jose State University, Nov 2017
60. Joint Genome Institute-LBNL, Nov 2017
59. University of Michigan, Ann Arbor, Oct 2017
58. University of Colorado, Boulder (**student-invited**), Oct 2017
57. Joint Bioenergy Institute-LBNL, Oct 2017
56. University of Utah (**Novartis Lecturer**), Sept 2017
55. McMaster University (Toronto, Canada), June 2017
54. University of Minnesota (**student-invited**), May 2017
53. UC Santa Cruz, Mar 2017
52. University of Maryland, Sept 2016
51. National Institutes of Health, Oct 2016
50. Tufts University, Sept 2016
49. University of Minnesota, April 2016
48. Tufts University, April 2016
47. Joint BioEnergy Institute-DOE, Feb 2016
46. University of Wyoming, Dec 2015
45. University of California, Davis, Sept 2015
44. University of California, Berkeley, Sept 2015
43. Kyoto University (Japan), Aug 2015
42. Chinese Academy of Medical Sciences (Beijing, China), Aug 2015
41. Peking University (Beijing, China), Aug 2015
40. University of California, San Francisco, May 2015
39. Stanford University, May 2015
38. University of Chicago, May 2015
37. University of Texas, Austin, April 2015
36. California Institute of Technology, April 2015
35. Princeton University, April 2015
34. Yale University, April 2015
33. Massachusetts Institute of Technology, April 2015
32. Max Planck Institute of Molecular Physiology (Dortmund, Germany), Mar 2015
31. RWTH Aachen University (Austria), Mar 2015
30. John Innes Centre (Norwich, UK), Mar 2015
29. MRC Laboratory of Molecular Biology (Cambridge, UK), Mar 2015
28. University of Wisconsin, Madison, Feb 2015
27. University of California, San Diego, Feb 2015
26. Scripps Research Institute, Feb 2015
25. University of Pennsylvania, Jan 2015
24. HHMI-Janelia Research Campus, Jan 2015
23. University of Colorado, Boulder, Jan 2015
23. University of California, Irvine, Nov 2014
22. University of North Carolina, Oct 2014
21. Duke University, Oct 2014

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20. University of Illinois, Urbana-Champaign (**student-invited**), Mar 2014
19. Boston College, Mar 2014
18. Brandeis University, Mar 2014
17. University of California, Berkeley, Mar 2014
16. University of Southern California, Feb 2014
15. Colorado State University, Oct 2013
14. National Cancer Institute-NIH, July 2013
13. Joint BioEnergy Institute-DOE, Feb 2013
12. German Cancer Research Center (Heidelberg, Germany), May 2012
11. Goethe University (Frankfurt, Germany), Institute for Molecular Biosciences, May 2012
10. Leopold Franzens University (Innsbruck, Austria), May 2012
9. Santa Clara University, Dec 2010
8. University of California, Berkeley, 2010
7. University of California, Riverside, Sept 2009
6. University of Southern California, Jan 2009
5. University of California, San Diego, Jan 2009
4. University of California, Berkeley, Dec 2008
3. Tufts University, Dec 2008
2. Columbia University, Nov 2008
1. Columbia University, June 2007

INVITED CONFERENCE TALKS (* are scheduled, underlined are international)

43. * *RNA Nanotechnology Gordon Conference, Jan 2023*
 42. * *Penn State Summer Symposium in Molecular Biology, Aug 2022*
 41. * *International Symposium on Nucleotide Second Messenger Signaling in Bacteria (Berlin, Germany), May 2022*
 40. * *Chemical Biology & Physiology Symposium (OHSU), Apr 2022*
 39. Activity-Based Sensing Symposium, Pacifichem (virtual), Dec 2021
 38. Functional Nucleic Acids Symposium, Pacifichem (virtual), Dec 2021
 37. German Conference on Synthetic Biology (**keynote**, virtual), Sept 2021
 36. Molecular Foundry User Meeting (virtual), Aug 2021
 35. Chemistry Graduate Student Symposium, University of Utah (**keynote**), Feb 2021
 34. Beckman Scholar Symposium (virtual), Aug 2020
 33. Sensory Transduction in Microorganisms Gordon Conference (Ventura, CA), Jan 2020
 32. Telluride Workshop on Aqueous Supramolecular Chemistry, Aug 2019
 31. Triple I Symposium, University of Utah (Salt Lake City, Utah), Oct 2019
 30. "Targeting RNA with Drugs" session, ACS National Meeting, Mar 2019
 29. Bacterial Locomotion and Signal Transduction meeting (**session chair** on "Technology Innovations", speaker), Jan 2019
 28. NYU-Nature Conference on Chemical Biology, Aug 2018
- Seminars above given after move to University of Utah (July 2018)**
27. (*Declined due to lab move*) MetaRNA symposium (Francis Crick Institute, London, UK), 2018
 26. (*Declined due to lab move*) FB3 Conference (Glasgow, UK), 2018
 25. Bioorganic Chemistry Gordon Conference, June 2018
 24. "Seeing is Believing" session, American Society of Microbiology, June 2018
 23. FNano – Foundations of Nanoscience Conference (Snowbird, Utah), April 2018

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22. “Discovery of Small Molecules Targeting RNA” session, ACS National Meeting, Mar 2018
21. Biophysics of Nuclear Organization and Function, UC Berkeley (**plenary speaker**), July 2017
20. Nucleosides, Nucleotides & Oligonucleotides Gordon Conference, June 2017
19. Nucleic Acid Chemistry and Biology Symposium - Canadian Society for Chemistry 100th Anniversary Conference (Toronto, Canada), May 2017
18. Chemical Tools for Complex Biological Systems, Janelia Research Campus, Apr 2017
17. Predictive Crop Design: Genome-to-Phenome, University of Nebraska-Lincoln, Apr 2017
16. RNA Nanotechnology Gordon Conference, Jan 2017
15. International Conference on Biomolecular Engineering, Jan 2017
14. Tri-Institutional Chemical Biology Symposium (**keynote speaker**), Aug 2016
13. Molecular Genetics and Phages Meeting (**session chair**, speaker), Aug 2016
12. Telluride Workshop on Nucleic Acid Chemistry, July 2016
11. American Society for Microbiology Annual Meeting, Jan 2016
10. NIH High Risk-High Reward Research Symposium, Jan 2015
9. IHÉS Conference on Cellular and Molecular Biotechnology (Paris, France), Dec 2015
8. Young Academic Investigators Symposium, ACS National Meeting, Aug 2015
7. Golden Jubilee Chemistry Conference (Singapore), Aug 2015
6. Synthetic Biology Meets Organic Synthesis Conference, UC Berkeley, Nov 2014
5. “Chemical approaches toward understanding and reprogramming RNA”, ACS National Meeting (**session co-chair**, speaker), Aug 2014
4. Symposium on Host-Microbe Systems Biology, University of Oregon, Aug 2014
3. ACS Chemical Biology award symposium in honor of Peter Dervan, ACS National Meeting, Mar 2014
2. International Synthetic Biology Workshop: A Bio-Based Future, Aug 2011
1. RNA Chemistry Meets Biology Conference, Lund University (Sweden), Sept 2006

ADDITIONAL CONFERENCE TALKS (underlined are international)

9. International Symposium on Nucleotide Second Messenger Signaling in Bacteria (Berlin, Germany), Sept 2018

Seminars above given after move to University of Utah (July 2018)

8. International Symposium on c-di-GMP Signaling in Bacteria (Berlin, Germany), Mar 2015
7. Fluorescent Biomolecules and Their Building Blocks Conference (FB3), Aug 2014
6. American Chemical Society National Meeting, Sept 2013
5. Challenges in Chemical Biology Conference (Boston, MA), July 2013
4. Bioorganic Chemistry Gordon Conference, June 2013
3. International Conference of RNA Nanotechnology and Therapeutics, Apr 2013
2. American Society of Biochemistry and Molecular Biology Annual Meeting, “RNA: processing, transport, and regulation” symposium, Apr 2009
1. Nucleic Acids Gordon Conference, June 2008

PRESS

- Feb 2022* Announcement of appointment to Beckman Scholar Program’s Executive Committee
<https://www.beckman-foundation.org/latest-news/two-bsp-awardees-appointed-to-programs-executive-committee/>
- Dec 2021* “The Future of Space Travel”, College of Science
<https://science.utah.edu/faculty/space-plants/>

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- Mar 2021 Research paper featured as Cover Article for ACS Synthetic Biology
https://pubs-acsc.org/pb-assets/images/_journalCovers/asbcd6/asbcd6_v010i003.jpg?0.4143013030257219
- Feb 2020 “Beckman Bites Podcast (Episode 2): Interview with Ming Hammond”, Beckman Foundation
<https://www.beckman-foundation.org/latest-news/new-beckman-bites-podcast-episode-2-now-available/>
- Jan 2020 “Congratulations 2020 Beckman Scholar Program Awardees”, Beckman Foundation
<https://www.beckman-foundation.org/latest-news/congratulations-2020-beckman-scholars-program-awardees/>
<https://chem.utah.edu/news/beckmanscholaraward.php>
- Oct 2019 “New twists and turns in bacterial locomotion and signal transduction”, Jan 2019 BLAST Meeting research talk featured in Conference Report
<https://doi.org/10.1128/JB.00439-19>
- Apr 2019 Research paper highlighted in eLife Science Digest
<https://doi.org/10.7554/eLife.43959.002>
- Feb 2019 “Marriott Library Honors Women Scientists”, University of Utah
<https://newsletter.lib.utah.edu/marriott-library-honors-women-scientists/>
- Jan 2019 “Recent advances and current trends in nucleotide second messenger signaling in bacteria”, Sept 2018 Berlin research talk featured in Conference Report
<https://doi.org/10.1016/j.jmb.2019.01.014>
- Jan 2019 “U professor successfully grows plants on space station”, Science & Tech article, KSL.com
<https://www.ksl.com/article/46490813/u-professor-successfully-grows-plants-on-space-station>
- Dec 2018 “U researchers send bioengineered plants into space”, Science & Tech article, KSL.com
<https://www.ksl.com/article/46456408/u-researchers-experiment-sends-bioengineered-plants-into-space>
- Dec 2018 “Synthetic biology goes to space”, EurekAlert article, AAAS
https://www.eurekalert.org/pub_releases/2018-12/uou-sbg122018.php
- Dec 2018 “ISU’s Hydra-1 experiment launched to the international space station”, International Space University press release
<http://www.isunet.edu/news/isu-s-hydra-1-experiment-launched-to-iss/599>
- Dec 2018 “U Chemistry in Space”, University of Utah press release
<https://unews.utah.edu/u-chemistry-in-spaaaaaaace/>
- Oct 2018 “Humans of the U” profile, University of Utah press release
<https://attheu.utah.edu/facultystaff/humans-of-the-u-july-october/>
- June 2018 “Innovative technology improves our understanding of bacterial signaling”, Joint Genome Institute (JGI) Science Highlight
<https://jgi.doe.gov/innovative-technology-improves-understanding-bacterial-cell-signaling/>
- Mar 2018 “Spotting the signal”, Research Highlight in *Nature Chemical Biology*
<https://www.nature.com/articles/s41589-018-0047-y>

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- Jan 2018 Research paper published in Future of Biochemistry special issue, *Biochemistry*
<https://pubs.acs.org/toc/bichaw/57/1>
<https://chemistry.berkeley.edu/news/the-future-of-biochemistry>
- Feb 2016 “Hammond’s high risk/high reward research pays off”, UC Berkeley College of Chemistry press release
<https://chemistry.berkeley.edu/news/hammond-research-pays-off>
- Jan 2016 Research paper highlighted in “2015: Signaling Breakthroughs of the Year” editorial guide from *Science Signaling*
<http://stke.sciencemag.org/content/9/409/eg1.full>

RESEARCH FUNDING

Current

Sorenson Legacy Foundation on “College of Science: Reprogramming Bacteria with Natural Inputs”. This research is focused on discovering nutrients and other chemical signals that impact bacterial behavior.

Office of Naval Research on “Biosensors for rapid prototyping of functional materials”. N00014-21-1-2188: This research is focused on developing a molecular sensing platform to improve energy harvesting yields of catalytic biomaterials.

Joint Genome Institute-DOE on “Community Science Program: High-throughput functional discovery of bacterial sensory-enzymes”. This research is focused on screening novel and engineered small molecule-binding domains.

Arnold and Mabel Beckman Foundation on “UoU Beckman Scholar Program”. This grant supports undergraduate researchers as Beckman Scholars at the University of Utah.

National Science Foundation-Binational Science Foundation on “NSF/MCB-BSF: Elucidating the transient contact-dependent molecular trade in multispecies bacterial communities”. 1815508: This research is focused on detecting RNA and cyclic dinucleotide transfer via bacterial nanotubes.

National Science Foundation on “REU Site: Catalysis in a collaborative REU program at the University of Utah”. 1659579: This grant supports the Research Experience for Undergraduates (REU) program at the University of Utah Department of Chemistry.

National Institutes of Health on “Enabling high-throughput analysis and single-cell imaging of bacterial signals”. R01 GM124589: This research is focused on biosensor development to study bacterial signaling within hosts and communities.

Completed

University of Utah on “1U4U: Development of beta-lactamase as a self-labeling protein tag”. This research is focused on development of an enzyme fusion tag for fluorescence microscopy.

Office of Naval Research on “Riboswitching on the light: Breaking the speed limit of riboswitches to make fast optical sensor cells”. N00014-19-1-2043: This research is focused on improving the response speed of cell-based biosensors.

National Science Foundation on “Collaborative Research: A model for divergent bacterial signaling networks; linking new cyclic dinucleotides to environmental and electrical lifestyles”. 1915466: This research is focused on cyclic dinucleotide signaling in *Geobacter sulfurreducens*.

Gilead Sciences on “Synthesis of labeled 2',3'-cGAMP”. Sponsored project

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Agilent Technologies on “Synthetic Biology Institute: Synthesis and Analysis of Fluorescent Riboswitch Ligands”. Sponsored project

National Institutes of Health on “Center for RNA Systems Biology”.

Women in Science Award – Chau Hoi Shuen Foundation on “Bringing Chemical Tools to Study RNA Epigenetics”.

Joint Genome Institute-DOE on “Community Science Program: Synthesis and parallel construction of a library of large binary vectors for the screening of suicide exons for multi-gene pathway engineering in plants”

NIH Director’s New Innovator Award – National Institutes of Health on “A Chemical Biology Approach to Tagging RNAs in Live Cells”. DP2 OD008677

Career Award at the Scientific Interface – Burroughs Wellcome Fund on "Large-Scale Discovery and Analysis of Regulatory RNAs using Computational and Chemical Approaches".

Regents’ Junior Faculty Fellowship – UC Berkeley on "Lighting Up RNAs: Fluorescent Tags for Live Cell Imaging of RNAs"

LEADERSHIP AND PROFESSIONAL SERVICE (from 2018 to current)

underlined are international

Grant reviewer

Aug-Nov 2021 Beckman Scholar Program, review panelist

June 2021 NIH-EBIT study section, ad hoc panelist

May 2021 NSF-MCB grant panelist (Systems and Synthetic Biology)

June 2020 NIH-EBIT study section, ad hoc panelist

Dec 2019 Canada Council for the Arts, Killam Fellowship Reviewer

Sept 2019 NSF-CAREER ad hoc grant reviewer

June 2019 NIH-EBIT study section, ad hoc panelist

May 2019 French National Research agency grant reviewer

Apr 2019 NSF-MCB grant panelist (Systems and Synthetic Biology)

Feb 2019 NIH-SBCA study section, ad hoc panelist

Sept 2018 NSF-CAREER ad hoc grant reviewer

Feb 2018 Houska Award (Austria) grant reviewer

Journal editorships

2020-2023 Analysis & Sensing, Chemistry Europe journal, Inaugural Editorial Board Member

2020-2023 FEMS Microbiology Reviews, Federation of European Microbiological Societies journal, Editorial Board Member

Jul 2019-Jun 2020 *Current Opinion in Chemical Biology*, Co-Editor, Molecular Imaging section

Other professional service

Sept 2022 Session chair, “Applying the Power of Bacterial Siangling”, Signal Transduction in Microorganism Gordon Research Conference

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|--------------|---|
| 2022-2024 | Executive Committee Member, Beckman Scholars Program, Arnold and Mabel Beckman Foundation |
| 2020-2022 | American Chemical Society, Alternate Councilor (elected), Division of Biological Chemistry |
| 2019-current | Faculty Member, Faculty Opinions (former Faculty of 1000) – Chemical Biology of the Cell Section |
| 2019- 2020 | Synthetic Biology: Engineering, Evolution & Design Conference – Organizing Committee |
| Jan 2019 | Session chair, “Technologies Innovations”, Bacterial Locomotion and Signal Transduction (BLAST) Meeting |

University leadership positions

| | |
|--------------|---|
| 2020-current | Co-Director, UoU Beckman Scholar Program |
| 2020-2022 | Council Member (elected), College of Science |
| 2019-current | Executive committee, Center for Cell & Genome Science |
| 2019-current | Co-Director, NSF REU Program |

Department service committees

| | |
|--------------|--|
| 2020-current | Chair, Seminar committee (Department of Chemistry) |
| 2019-current | Chair, Junior Faculty Mentoring committee (Department of Chemistry) |
| 2019-2021 | Graduate Education committee (Department of Chemistry) |
| 2019-2020 | Curriculum committee (Biological Chemistry Graduate Program) |
| 2018-2020 | Graduate Admissions committee (Department of Chemistry) |
| 2018-2019 | Chemical Education / CSME faculty search committee (Department of Chemistry) |
| 2018-2019 | Biological Chemistry Graduate Admissions committee (Biological Chemistry Graduate Program) |

Invited Workshops

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|----------|--|
| Oct 2019 | NSF Square-Table workshop on Programmable Interfaces: Exploring the Intersection of Synthetic Biology, Biomaterials, and Soft Matter |
| Mar 2018 | DOE-Joint Genome Institute SynBio Strategy Meeting |

TEACHING

University of Utah

Chemistry 5750, Advanced Chemical Biology Laboratory

Chem 5750 is a half-semester upper-division lab course designed to provide undergraduate students with an exposure to select experimental procedures in chemical biology through a set of guided lab exercises that comprise two main projects and a final student-proposed project. (Spring 2019A, Spring 2020A, Spring 2021B)

Chemistry 2325, Organic Chemistry Laboratory

The purpose of the laboratory is to give students hands on experience with the scientific method, teach critical thinking and writing skill as well as important techniques to prepare students for

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advanced work in chemistry and related science and engineering fields, review concepts learned in lecture, and to introduce certain concepts that are well-suited to hands-on discovery.
(Spring 2019B)

Chemistry 7430, Chemical Biology of Proteins – Graduate Lecture

This course is intended for advanced undergraduate and first-year graduate students in Chemistry, Biology, Biochemistry, Biotechnology, and Bioengineering. The subject matter will include a brief background on biomolecular structure and function, then focus on the use of organic chemistry as a tool for manipulating biomolecules, exploring the breakthrough technologies that have enabled recent advantages in fields including protein labeling, protein interactions, biosensors, and nanotechnology.
(Fall 2019A, Fall 2020A)

Chemistry 7470 (5470), Nucleic Acid Chemistry – Graduate Lecture

This course is intended for advanced undergraduate and first-year graduate students. Topics include chemical synthesis of DNA and RNA, nucleoside and oligomer analogs, chemistry of DNA damage and repair, nucleic acid-targeted drugs and binding agents.
(Spring 2020B, Spring 2021B)

UC Berkeley

Chemistry C96, Introduction to Research and Study in the College of Chemistry – Seminar

Introduces freshmen to research activities and programs of study in the College of Chemistry, includes lectures by faculty, the opportunity to meet alumni and advanced undergraduates in an informal atmosphere, and tours of research labs.
(Fall 2010, Fall 2013)

Chemistry 3BL, Organic Chemistry Laboratory

The synthesis and purification of organic compounds will be explored. Natural product chemistry will be introduced. Advanced spectroscopic methods including infrared, ultraviolet, and nuclear magnetic resonance spectroscopy and mass spectrometry will be used to analyze products prepared and/or isolated. Qualitative analysis of organic compounds will be covered.
(Fall 2015)

Chemistry 4B, General Chemistry & Quantitative Analysis – Lecture

Series is intended for majors in physical, biological sciences, and engineering. It presents the foundation principles of chemistry, including stoichiometry, ideal and real gases, acid-base and solubility equilibria, oxidation-reduction reactions, thermochemistry, entropy, nuclear chemistry and radioactivity, the atoms and elements, the periodic table, quantum theory, chemical bonding, molecular structure, chemical kinetics, and descriptive
(Spring 2018)

Chemistry 114, Advanced Chemical Biology – Lecture

One-semester pilot course designed to provide undergraduate students with an exposure to select topics in modern chemical biology through the presentation and discussion of case studies. Students will gain a working knowledge of different chemical biology approaches to study protein and nucleic acid function.
(Spring 2017)

Chemistry 115, Organic Chemistry – Advanced Laboratory Methods

Advanced synthetic methods, chemical and spectroscopic structural methods, designed as a preparation for experimental research.
(Spring 2010, Spring 2012)

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Chemistry 135, Chemical Biology – Lecture

Introduction to biochemistry and chemical biology, geared towards chemistry and chemical biology majors.

(Spring 2011, Fall 2011, Spring 2014, Fall 2014)

Chemistry 271 / Molecular and Cell Biology 212, Chemical Biology I-III – Graduate Lecture

Survey of current topics in chemical biology research with a focus on concepts and tools from chemistry that are uniquely enabling of biological discovery.

(Spring 2015, Spring 2016)

Molecular and Cell Biology 290, Graduate Seminar

Graduate student presentations on selected research topics in molecular and cell biology.

(Spring 2012)