Alexander Ryan Lippert, Ph.D.

Department of Chemistry and Center for Drug Discovery, Design, and Delivery (CD4)
Southern Methodist University
3215 Daniel Avenue, Dallas, TX 75275-0314
TEL: 214-768-2482
Email: alippert@smu.edu URL: http://blog.smu.edu/alippert/

Education and Training

2009–2012 **University of California, Berkeley**, *Berkeley, California*
Postdoctoral Studies in Chemical Biology
Advisor: Prof. Christopher J. Chang

2007–2008 **University of Pennsylvania**, *Philadelphia, Pennsylvania*
Ph.D. in Synthetic Chemistry
Advisor: Prof. Jeffrey W. Bode

2003–2007 **University of California, Santa Barbara**, *Santa Barbara, California*
Ph.D. candidate in Synthetic Chemistry
Advisor: Prof. Jeffrey W. Bode

1998–2003 **California Institute of Technology**, *Pasadena, California*
B.S. in Chemistry
Advisor: Prof. Linda Hsieh-Wilson

Positions

2018–present **Southern Methodist University**, *Dallas, Texas*, Associate Professor of Chemistry

2012–2018 **Southern Methodist University**, *Dallas, Texas*, Assistant Professor of Chemistry

2016–present **BioLum Sciences, LLC**, *Dallas, Texas*, Chief Science Officer

Honors, Awards, and Affiliations

(11) President’s Associate Award (2022)

(10) HOPE Teaching Award Nomination (2020)

(9) Engaged Learning Excellence in Mentoring Award (2018)

(8) Department of Chemistry Citizenship Award (2018)

(7) Sam Taylor Fellowship (2016–2017)

(6) Member, Cognitive Science Research Cluster, Southern Methodist University (2015–present)

(5) Member, Center for Global Health Impact (CGHI), Southern Methodist University (2014–present)

(4) Member, Biopsychosocial Research Cluster, Southern Methodist University (2013–present)

(3) Member, Center for Drug Discovery, Design, and Delivery (CD4), Southern Methodist University (2012–present)

(2) Robert H. De Wolfe Teaching Fellowship (2007)

(1) Member, American Chemical Society (2004–present)

Publications and Patents

Affiliated with Southern Methodist University (Underline = undergraduate; Underline italicized = high school author; * = Corresponding author)
Google Scholar Page:
https://scholar.google.co.in/citations?user=cqCK6zMAAAAJ&hl=en

(54) Kagalwala, H. N.; Reeves, R. T.; **Lippert, A. R.** "Chemiluminescent spiroadamantane-1,2-dioxetanes: Recent advances in molecular imaging and biomarker detection." *Curr. Opin. Chem. Biol.* **2022**, *68*, 102134. doi: 10.1016/j.cbpa.2022.102134. *Impact Factor = 9*

(53) Digby, E. M.; Tung, M. T.; Kagalwala, H. N.; Ryan, L. S.; **Lippert, A. R.**; Beharry, A. A. "Dark Dynamic Therapy: Photosensitization without Light Excitation Using Chemiluminescence Resonance Energy Transfer in a Dioxetane–Erythrosin B Conjugate." *ACS Chem. Biol.* **2022**, Early View. doi: 10.1021/acschembio.1c00925. *Impact Factor = 5*

(52) Kagalwala, H. N.; Gerberich, J.; Smith, C. J.; Mason, R. P.; **Lippert, A. R.** "Chemiluminescent 1,2-Dioxetane Iridium Complexes for Near-Infrared Oxygen Sensing." *Angew. Chem. Int. Edit.* **2022**, Early View, e202115704. doi: 10.1002/ange.202115704. *Impact Factor = 15*

(51) Chandrasiri, I.; Yaddehige, M. L.; Li, B.; Sun, Y.; Meador, W. E.; Dorris, A.; Zia, M. F.; Hammer, N. I.; Flynt, A.; Delcamp, J. H.; Davis, E.; **Lippert, A.**; Watkins, D. L. "Cross-linking Poly(caprolactone)-Polyamidoamine Linear Dendritic Block Copolymers for Theranostic Nanomedicine." *ACS Appl. Polym. Mater.* **2022**, online publication. doi: 10.1021/acsapm.1c01131. *Impact Factor = 4*

(50) Haris, U.; Plank, J. T.; Li, B.; Page, Z. A.; **Lippert, A. R.** "Visible Light Chemical Micropatterning Using a Digital Light Processing Fluorescence Microscope." *ACS Cent. Sci.* **2021**, *8*, 67–76. doi: 10.1021/acscentsci.1c01234. *Impact Factor = 15*

(49) Li, B.; Kim, Y. L.; Lippert, A. R. "Chemiluminescence measurement of Reactive Sulfur and Nitrogen Species." *Antioxid. Redox Signal.* **2021**, *36*, 4–6. doi: 10.1089/ars.2021.0195. *Impact Factor = 8*

(48) Haris, U.; Kagalwala, H. N.; Kim, Y. J.; **Lippert, A. R.** "Seeking Illumination: The Path to Chemiluminescent 1,2-Dioxetanes for Quantitative Measurements and *In Vivo* Imaging." *Acc. Chem. Res.* **2021**, *54*, 2844–2857. doi: 10.1021/acs.accounts.1c00185. *Impact Factor = 22*

(47) Ritz, T.; Salsman, M. L.; Young, D. A.; **Lippert, A. R.**; Khan, D. A.; Ginty, A. T. "Boosting nitric oxide in stress and respiratory infection: Potential relevance for asthma and COVID-19." *Brain Behav. Immun. Health* **2021**, *14*, 100255. doi: 10.1016/j.bbih.2021.100255. *Impact Factor = 7*

(46) Lefton, J. B.; Pekar, K. B.; Haris, U., Zick, M. E.; Milner, P. J.; **Lippert, A. R.**; Pejov, L; Runcevski, T. "Defect formation and amorphization of Zn-MOF-74 crystals by post-synthetic interactions with bidentate adsorbates." *J. Mater. Chem. A* **2021**, *9*, 19698–19704. doi: 10.1016/10.1039/DOTA10613E. *Impact Factor = 13*

(45) Ryan, L. S.; Nakatsuka, A.; **Lippert, A. R.** "Photoactivatavle 1,2-dioxetane chemiluminophores." *Results in Chemistry* **2021**, *3*, 100106. doi: 10.1016/j.rechem.2021.100106.

(44) Li, B.; Haris, U.; Aljowni, M.; Nakatsuka, A.; Patel, S. K.; **Lippert, A. R.** "Tuning the Photophysical Properties of Spirolactam Rhodamine Photoswitches." *Isr. J. Chem.* **2020**, *61*, 3–4. doi: 10.10002/ijch.202000083. *Impact Factor = 4*

(43) Bunton, C. B.; Bassampour, Z. M.; Boothby, J. M.; Smith, A. N.; Rose, J. V.; Nguyen, D. M.; Ware, T. H.; Csaky, K. G.; **Lippert, A. R.**; Tsarevsky, N. V.; Son, D. Y. "Degradable Silyl Ether–Containing Networks from Trifunctional Thiols and Acrylates." *Macromolecules* **2020**, *53*, 9890−9900. doi: 10.1021/acs.macromol.0c01967. *Impact Factor = 6*

(42) Quimbar, M. E.; Davis, S. Q.; Al-Farra, S. T.; Hayes, A.; Jovic, V.; Masuda, M.; **Lippert, A. R.** "Chemiluminescent Measurement of Hydrogen Peroxide in Exhaled Breath Condensate of Healthy and Asthmatic Adults." *Anal. Chem.* **2020**, 92, 14594−14600. doi: 10.1021/acs.analchem.0c02929. *Impact Factor = 7*

(41) Ryan, L. S.; Gerberich, J.; Haris, U.; Nguyen, D.; Mason, R. P.; **Lippert, A. R.** "Ratiometric pH Imaging Using a 1,2-Dioxetane Chemiluminescence Resonance Energy Transfer Sensor in Live Animals." *ACS Sens.* **2020**, 5, 2925−2932. doi: 10.1021/acssensors.0c01393; *ChemRxiv* **2020**. *Impact Factor = 8*

(40) Bezner, B. J.; Ryan, L. S.; **Lippert, A. R.** "Reaction-Based Luminescent Probes for Reactive Sulfur, Oxygen, and Nitrogen Species: Analytical Techniques and Recent Progress." *Anal. Chem.* **2020**, *92*, 309–326. doi: 10.1021/analchem.9b04990. *Impact Factor = 7*

(39) Wise, J. G.; Nanayakkara, A. M.; Aljowni, M.; Chen, G.; De Oliveira, M. C.; Ammerman, L.; Olengue, K.; **Lippert, A. R.**; Vogel, P. D.* "Optimizing Targeted Inhibitors of P-Glycoprotein Using Computational and Structure-Guided Approaches." *J. Med. Chem.* **2019**, *62*, 10645–10663. doi: 10.1021/acs.jmedchem.9b00966. *Impact Factor = 7*

(38) Worth, R. C.; Mizrachi, A.; Li, H.; Markovsky, E.; Enyedi, B.; Jacobi, J.; Brodsky, O.; Cao, J.; **Lippert, A. R.**; Incrocci, L.; Mulhall, J. P.; Haimovitz-Friedman, A. "Sildenafil Protects Endothelial Cells from Radiation-Induced Oxidative Stress." *J. Sex. Med.* **2019**, *16*, 1721–1733. doi: 10.1016/j.jsxm.2019.08.015. *Impact Factor = 3*

(37) Jones, K. A.; Kentala, K.; Beck, M. W.; An. W.; **Lippert, A. R.**; Lewis, J. C.; Dickinson, B. C. "Development of a Split Esterase for Protein-Protein Interaction-Dependent Small-Molecule Activation." *ACS Cent. Sci.* **2019**, *5*, 1768–1776. doi: 10.1021/acscentsci.9b00567. *Impact Factor = 15*

(36) Ryan, L. S.; Gerberich, J. L.; Cao, J.; An, W.; Jenkins, B. A.; Mason, R. P.; **Lippert, A. R.** "Kinetics-Based Measurement of Hypoxia in Living Cells and Animals Using an Acetoxymethyl Ester Chemiluminescent Probe." *ACS Sens.* **2019**, *4*, 1391–1398. doi: 10.1021/acssensors.9b00360. *Impact Factor = 8*

(35) An, W.; Ryan, L. S.; Reeves, A. G.; Bruemmer, K. J.; Mouhaffel, M.; Gerberich, J. L.; Winters, A.; Mason, R. P., **Lippert, A. R.** "A Chemiluinescent Probe for HNO Quantification and Real-time Monitoring in Living Cells." *Angew. Chem. Int. Edit.* **2019**, *58*, 1361–1365. doi: 10.1002/anie.201811257. *Impact Factor = 15*

(34) Woods, J. J.; Cao, J.; **Lippert, A. R.**; Wilson, J. J. "Characterization and Biological Activity of a Hydrogen-Sulfide Releasing Red Light-Activated Ruthenium (II) Complex." *J. Am. Chem. Soc.* **2018**, *140*, 12383–12387. doi: 10.1021/jacs.8b08695. *Impact Factor = 15*

(33) Wise, J. G.; Vogel, P. D.; **Lippert, A. R.**; Nanyakkara, A. K.; Aljowni, M. A. (Southern Methodist University) "Inhibitors of Multidrug Resistance Transporter P-Glycoprotein." U.S. Patent Application 15,911,441, filed July 5, 2018.

(32) An, W.; Mason, R. P.; **Lippert, A. R.** "Energy Transfer Chemiluminescence for Ratiometric pH Imaging." *Org. Biomol. Chem.* **2018,** *16*, 4176–4182. doi: 10.1039/C8OB00972D. *Impact Factor = 4*

(31) Cao, J.; An, W.; Reeves, A. G.; **Lippert, A. R.** "A Chemiluminescent Probe for Cellular Peroxynitrite Using a Self-Immolative Oxidative Decarbonylation Reaction." *Chem. Sci.* **2018**, *9*, 2552–2558. doi: 10.1039/C7SC05087A. *Impact Factor = 10*

(30) Ryan, L. S.; **Lippert, A. R.** "Ultrasensitive chemiluminescent detection of cathepsin B: Insights into the new frontier of chemiluminescent imaging." *Angew. Chem. Int. Ed.* **2018**, *57*, 622–624. doi:10.1002/anie.201711228. *Impact Factor = 15*

(29) Patel, S. K.; Cao, J.; **Lippert, A. R.** "A Volumetric Three-Dimensional Digital Light Photoactivatable Dye Display." *Nature Commun.* **2017**,15239. doi: 10.1038/ncomms15239. *Impact Factor = 15*

(28) Kroll, J. L.; Chelsey, C. A.; Reeves, A. G.; Bruemmer, K. J.; **Lippert, A. R.**; Ritz, T. "Sensitivity of Salivary Hydrogen Sulfide to Psychological Stress and its Association with Exhaled Nitric Oxide and Affect." *Physiol. Behav.* **2017**, *179*, 99–104. doi: 10.1016/j.physbeh.2017.05.023. *Impact Factor = 3*

(27) Reeves, A. G.; Subbarao, M.; **Lippert, A. R.** "Imaging Acetaldehyde Formation During Ethanol Metabolism in A549 Cells using a Hydrazinyl Naphthalimide Fluorescent Probe." *Anal. Methods* **2017**, *9*, 3418–3421. doi: 10.1039/C7AY01238A. *Impact Factor = 3*

(26) **Lippert, A. R.*** "Unlocking the Potential of Chemiluminescence Imaging." *ACS Cent. Sci.* **2017**, *3*, 269–271. doi: 10.1021/acscentsci.7b00107. *Impact Factor = 15*

(25) Lippert, A. R.; Cao, J. "1-(Cyanomethyl)tetrahydro-1H-thiophen-1-ium Bromide." *e-EROS Encyclopedia of Reagents for Organic Synthesis* **2016**, 1–4.

(24) Patel, S. K.; **Lippert, A. R.** (Southern Methodist University) "System and Method for a Three-Dimensional Optical Switch Display (OSD) Device." U.S. Patent Application 62,293,128, filed October 7, 2016.

(23) Quimbar, M. E.; Krenek, K. M.; **Lippert, A. R.** "A chemiluminescent platform for smartphone monitoring of H_2O_2 in human exhaled breath condensates." *Methods* **2016**, *109*, 123–130. doi: 10.1016/j.ymeth.2016.05.017. *Impact Factor = 4*

(22) Terrell, J. B.; **Lippert, A. R.**; Raicevic, S. (LMG Innovations, LLC) "Chemiluminescent Spray and Methods Related Thereto." U.S. Provisional Patent Application 62,331,896, filed May 19, 2016.

(21) Cao, J.; Campbell, J.; Liu, L.; Mason, R. P.; **Lippert, A. R.** "In Vivo Chemiluminescent Imaging Agents for Nitroreductase and Tissue Oxygenation." *Anal. Chem.* **2016**, *88*, 4995–5002. doi: 10.1021/acs.analchem.6b01096. *Impact Factor = 7*

(20) Cao, J.; Lopez, R.; Thacker, J. M.; Moon, J. Y.; *Jiang, C.*; Morris, S. N. S.; Bauer, J. H.; Tao, P.; Mason, R. P.; **Lippert, A. R.** "Chemiluminescent Probes for Imaging H_2S in Living Animals." *Chem. Sci.* **2015**, *6*, 1979–1985. doi: 10.1039/C4SC03516J. *Impact Factor = 10*

(19) **Lippert, A. R.**; Dickinson, B. C.; New, E. J. "Imaging Mitochondrial Hydrogen Peroxide in Living Cells." *Methods Mol. Biol.* **2015**, *1264*, 231–243. doi: 10.1007/978-1-4939-2257-4_21.

(18) Lin, V. S.; **Lippert, A. R.**; Chang, C. J. "Azide-Based Fluorescent Probes: Imaging Hydrogen Sulfide in Living Systems." *Methods Enzymol.* **2015**, *554*, 63–80. doi: 10.1016/bs.mie.2014.11.011.

(17) Bruemmer, K. J.; Merrikhihaghi, S.; Lollar, C. T.; Morris, S. N. S.; Bauer, J. H.; **Lippert, A. R.** "^{19}F Magnetic Resonance Probes for Detecting Peroxynitrite in Living Cells Using an Oxidative Decarbonylation Reaction." *Chem. Commun.* **2014**, *50*, 12311–12314. doi: 10.1039/C4CC04292A. *Impact Factor = 6*

(16) Krenek, K. M.; **Lippert, A. R.** (Southern Methodist University) "Composition, Device and Imaging System for Analysis Using Chemiluminescent Probes", U.S. Patent Application 14,741,141, filed June 16, 2015.

(15) Lollar, C. T.; Krenek, K. M.; Bruemmer, K. J.; **Lippert, A. R.** "Ylide Mediated Carbonyl Homologations for the Preparation of Isatin Derivatives." *Org. Biomol. Chem.* **2014**, *12*, 406–409. doi: 10.1039/C3OB42024H. *Impact Factor = 3*

(14) **Lippert, A. R.** "Designing Reaction-Based Probes for the Selective Detection of Hydrogen Sulfide." *J. Inorg. Biochem.* **2014**, *133*, 136–142. doi: 10.1016/j.jinorgbio.2013.10.010. *Impact Factor = 4*

(13) Lin, V. S.; **Lippert, A. R.**; Chang, C. J. "Cell-trappable fluorescent probes for endogenous hydrogen sulfide signaling: Imaging H_2O_2-dependent H_2S production." *Proc. Natl. Acad. Sci. USA* **2013**, *110*, 7131–7135. doi: 10.1073/pnas.1302193110. *Impact Factor = 11*

Unaffiliated with Southern Methodist University

(12) **Lippert, A. R.**; Chang, C. J. (The Regents of The University of California, Oakland, CA) "Compositions and Methods for Imaging", U.S. Patent 13,816,620, filed August 22, 2011, and issued August 15, 2013.

(11) Michel, B. W.; **Lippert, A. R.**; Chang, C. J. "A Reaction-Based Fluorescent Probe for Selective Imaging of Carbon Monoxide in Living Cells Using a Palladium-Mediated Carbonylation." *J. Am. Chem. Soc.* **2012**, *124*, 15668–15671. *Impact Factor = 15*

(10) **Lippert, A. R.**; Lin, V.; Chang, C. J. (The Regents of The University of California, Oakland, CA) "Fluorescent Probes for Reactive Sulfur Species", U.S. Patent 13,493,253, filed June 10, 2011, and issued Dec 27, 2012.

(9) **Lippert, A. R.**; Van De Bittner, G. C.; Chang, C. J. "Boronate Oxidation as a Bioorthogonal Reaction Approach for Studying the Chemistry of Hydrogen Peroxide in Living Systems." *Acc. Chem. Res.* **2011**, *44*, 793–804. *Impact Factor = 22*

(8) **Lippert, A. R.**; New, E. J.; Chang, C. J. "Reaction-Based Fluorescent Probes for the Selective Imaging of Hydrogen Sulfide in Living Cells." *J. Am. Chem. Soc.* **2011**, *133*, 10078–10080. *Impact Factor = 15*

(7) **Lippert, A. R.**; Keshari, K. R.; Kurhanewicz, J.; Chang, C. J. "A Hydrogen Peroxide-Responsive Hyperpolarized ^{13}C MRI Contrast Agent." *J. Am. Chem. Soc.* **2011**, *133*, 3776–3779. *Impact Factor = 15*

(6) **Lippert, A. R.**; Naganawa, A.; Keleshian, V. L.; Bode, J. W. "Synthesis of Phototrappable Shapeshifting Molecules for Adaptive Guest Binding." *J. Am. Chem. Soc.* **2010**, *132*, 15790–15799. *Impact Factor = 15*

(5) **Lippert, A. R.**; Gschneidtner, T.; Chang, C. J. "Lanthanide-Based Luminescent Probes for Selective Time-Gated Detection of Hydrogen Peroxide in Water and Living Cells." *Chem. Commun.* **2010**, *46*, 7510–7512. *Impact Factor = 6*

(4) **Lippert, A. R.**; Keleshian, V. L.; Bode, J. W. "Dynamic Supramolecular Complexation by Shapeshifting Organic Molecules." *Org. Biomol. Chem*. **2009**, *7*, 1529–1532. *Impact Factor = 3*

(3) Ju, L.; **Lippert, A. R.**; Bode, J. W. "Stereoretentive Synthesis and Chemoselective Amide-Forming Ligations of C-Terminal Peptide α-Ketoacids." *J. Am. Chem. Soc.* **2008**, *130*, 4253–4255. *Impact Factor = 15*

(2) **Lippert, A. R.**; Kaeobamrung, J.; Bode, J. W. "Synthesis of Oligosubstituted Bullvalones: Shapeshifting Molecules Under Basic Conditions." *J. Am. Chem. Soc.* **2006**, *128*, 14738–14739. *Impact Factor = 15*

(1) Khidekel, N.; Arndt, S.; Lamarre-Vincent, N.; **Lippert, A.**; Poulin-Kerstien, K. G.; Ramakrishnan, B.; Qasba, P. K.; Hsieh-Wilson, L. C. "A Chemoenzymatic Approach toward Rapid and Sensitive Detection of *O*-GlcNAc Posttranslational Modifications." *J. Am. Chem. Soc.* **2003**, *125*, 16162–16163. *Impact Factor = 15*

Awards

Principal Investigator Awards for Research Support ($2,845,403 in external funding)

NSF
2155170
09/1/2022–8/31/2025
$500,000 in funds to support the project, “1,2-Dioxetanes for Quantitative Chemiluminescence Imaging.”
Role: PI

NIGMS
1R41GM140575-01
9/8/2021–9/7/2022
$251,943 in funds to support the project, "A Chemiluminescent Assay and Device for Monitoring Vascular Endogenous Nitric Oxide"
Role: PI

Welch Research Foundation
N-2038-20200401
06/01/20–05/31/23
$240,000 in funds to support the project, “Single Molecule Localization Lithography”
Role: PI

ACS Petroleum Research Fund
60759-ND1
09/01/20–8/31/22
$110,000 in funds to support the project "Synthetic Methods for Single Molecule Chemistry Using Single Molecule Localization Microscopy"
Role: PI

NIGMS
R15GM114792, R15GM114792-02
10/1/2015–5/31/2022
$725,603 in funds to support stipends, supplies, and travel for the project, "Chemical Probes for Imaging Reactive Sulfur, Oxygen, and Nitrogen Species in Living Cells and Clinical Samples"
Role: PI

NSF CAREER
1653474
7/1/2017–7/1/2022
$611,598 in funds to support stipends, supplies, and travel the project, "CAREER: Triggered Energy Transfer Chemiluminescence for In Vivo Imaging."
Role: PI

NSF MRI
1827831
8/1/2018–7/31/2019 (estimated)
$351,687 in funds to support the development of the instrument in the project titled, “MRI: Acquisition of an Integrated Bionanomaterials Characterization and Imaging System for Research and Education Initiatives in Bioengineering.”
Role: co-PI

Sam Taylor Fellowship
12/8/2016-11/17/2017

$1,989 in funds to support the project, "A 'Chemical Nose' Test for Spice/K2 Cannabinoids and Synthetic Derivatives."
Role: PI

LMG Innovations, LLC
1/4/2016-6/3/2016
$52,583 in funds to support the project, "Development of a chemiluminescent spray for the detection of analytes."
Role: PI

University Research Council
12/18/2015–5/31/2017
$4,985 in funds to buy supplies and equipment for the project, "Development and Prototyping of a Volumetric Three-Dimensional Optical Switch Display (OSD) Device."
Role: PI

Dean's Research Council Grant
7/1/2015–6/31/2016
$29,965 in funds to support stipends, supplies, travel, and participant reimbursement for the project, "Smartphone Monitoring of Airway Inflammation During Psychosocial Stress in Asthma."
Role: co-PI

CD4 Seed Funds
12/19/2013–unrestricted
$2,500 in funds from the Center for Drug Discovery, Design, and Delivery (CD4) to obtain preliminary data for the project, "Chemiluminescent Molecular Imaging Probes for the Detection and Management of Prostate Cancer."
Role: PI

CD4 Seed Funds
12/19/2013–unrestricted
$2,500 in funds from the Center for Drug Discovery, Design, and Delivery (CD4) to obtain preliminary data for the project, "Optimization of Lead Drug Hits to Inhibit the Multi-drug Resistant Protein."
Role: co-PI

Mentored Awards for Research Support ($101,600)

Hamilton Undergraduate Research Award (Chancellor Smith)
9/2/2021–5/6/2022
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, "Synthesis and Mechanisms of Spiroadamantane 1,2-Dioxetane Chemiluminescence Probes."
Role: mentor

Hamilton Undergraduate Research Award (Tate Reeves)
5/22/2021–8/13/2021
$1,750 from the Hamilton Foundation for a summer undergraduate research stipend for the project titled, "Single Molecule Signal Transduction for Molecular Circuitry."
Role: mentor

Engaged Learning Program (Daphne Nguyen)
3/2/2020–4/15/2021
$2,000 from the Engaged Learning Program to support the project titled, "Improving the Sensitivity of Chemiluminescent Hydrogen Sulfide Imaging Agents."
Role: mentor

Engaged Learning Program (Andrew Nakatsuka)
2/15/2020–5/20/2020
$2,000 from the Engaged Learning Program to support the project titled, “Synthesis and Characterization of Boron-Dipyrromethene Dyes for Chemiluminescent Coupling."
Role: mentor

Hamilton Undergraduate Research Award (Becky Jenkins)
9/2/2019–5/6/2020
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “Tuning the Kinetics of Chemiluminescent H2S Probes for Increased Sensitivity.”
Role: mentor

Hamilton Undergraduate Research Award (Lyn Mouhaffel)
5/17/2019–8/8/2019
$2,250 from the Hamilton Foundation for a summer undergraduate research stipend for the project titled, “Ratiometric pH Imaging Using Chemiluminescent pH Sensitive Probes."
Role: mentor

Hamilton Undergraduate Research Award (Becky Jenkins)
9/2/2017–5/6/2018
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “A Cell-Trappable Chemiluminescent Probe for Peroxynitrite.”
Role: mentor

Engaged Learning Program (Anthony Spearman)
10/3/2017–5/15/2018
$2,000 from the Engaged Learning Program to support the project titled, “True-color Three-Dimensional Image Display."
Role: mentor

Engaged Learning Program (Justin Musser)
10/3/2017–5/15/2018
$2,000 from the Engaged Learning Program for reagents and supplies for the undergraduate research project titled, “Fluorescence Aided Navigation of Magnetic Microbots for Delivery of Molecular Cargos."
Role: mentor

Hamilton Undergraduate Research Award (Anthony Spearman)
9/2/2016–5/6/2017
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “A 'Chemical Nose' Test for Spice/K2 Cannabinoids and Synthetic Derivatives.”
Role: mentor

Hamilton Undergraduate Research Award (Shreya Patel)
9/2/2015–5/6/2016
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “Volumetric 3D Digital Photoactivatable Dye (3D Light PAD) Displays.”
Role: mentor

Engaged Learning Program (Stefan Raicevic)
2/6/2016–5/15/2017
$2,000 from the Engaged Learning Program to support the project titled, “Development of a Chemiluminescent Aerosol Spray for Aerial Detection of H_2S and Other Compounds."
Role: mentor

Engaged Learning Program (Shreya Patel)
2/6/2016–5/15/2017
$2,000 from the Engaged Learning Program for reagents and supplies for the undergraduate research project titled, “Rhodamine-Derived Optical Switch for Three-Dimensional Image Generation."
Role: mentor

Hamilton Undergraduate Research Award (Maureen Lohry)
5/17/2016–8/8/2016
$2,000 from the Hamilton Foundation for a summer undergraduate research stipend for the project titled, “Chemiluminescent reagents for detecting superoxide using an acyl transfer reaction."
Role: mentor

Hamilton Undergraduate Research Award (Miguel Quimbar)
9/2/2015–5/6/2016
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “Chemiluminescent Platform for Smartphone Monitoring of Respiratory Disease.”
Role: mentor

Biehl Graduate Fellowship (Jian Cao)
8/26/2015–5/6/2016
$24,500 to support graduate stipend for the project, "Triggered Energy Transfer Chemiluminescence for In Vivo Imaging."
Role: mentor

Puerto Rico Louis Stokes Alliance for Minority Participation (Natanael Corsino)
6/1/2015–8/31/2015
$4,800 to support stipend, transportation, lodging, and meals for a visiting student from the University of Puerto Rico to perform the undergraduate research project titled, “Tracking Cellular Uptake of Titanium with Fluorescence Microscopy.”
Role: co-mentor with Prof. Arthur Tinoco

Big iDeas and Cox Business Plan Competitions (Miguel Quimbar, Edward Allegra, Jack Reynolds)
2/20/2015–unrestricted
$37,050 in funds to support the start-up company “BioLum Sciences, LLC” with the aim to commercialize a chemiluminescent platform for smartphone monitoring of airway oxidative stress.
Role: mentor

Engaged Learning Program (Audrey Reeves)
2/6/2015–1/15/2017
$2,000 from the Engaged Learning Program for reagents and supplies for the undergraduate research project titled, “Visualizing the Chemistry of Human Health and Disease with Fluorescent Probes."
Role: mentor

Engaged Learning Program (Miguel Quimbar)
2/6/2015–1/15/2017
$2,000 from the Engaged Learning Program for reagents and supplies for the undergraduate research project titled, “Development of a Smartphone-based Chemiluminescent Point-of-care Imaging Device."
Role: mentor

Hamilton Undergraduate Research Award (Kevin J. Bruemmer)
8/26/2013–5/6/2014
$1,500 from the Hamilton Foundation for an academic year undergraduate research stipend for the project titled, “Detection of Peroxynitrite using Chemical Shift-Switching ^{19}F Magnetic Resonance Probes.”

Role: mentor

Hamilton Undergraduate Research Award (Christina T. Lollar)
5/17/2013–8/8/2013
$2,000 from the Hamilton Foundation for a summer undergraduate research stipend for the project titled, “Sulfur Ylide Method for the Synthesis of Benzil Derivatives."
Role: mentor

Engaged Learning Program (Christina T. Lollar)
3/26/2013–10/15/2015
$2,000 from the Engaged Learning Program for reagents and supplies to support the undergraduate research project titled, “Sulfur Ylide Method for the Synthesis of Benzil Derivatives.”
Role: mentor

Engaged Learning Program (Kevin J. Bruemmer)
3/26/2013–10/15/2014
$2,000 from the Engaged Learning Program for reagents and supplies for the undergraduate research project titled, “Detection of Peroxynitrite using Chemical Shift-Switching ^{19}F Magnetic Resonance Probes.”
Role: mentor

Presentations and Conference Abstracts

Invited Talks

(42) **Pacifichem** Virtual Meeting (December 2021). “Measuring and Quantifying Reactive Sulfur, Oxygen, and Nitrogen Species Using Chemiluminescent Technology”

(41) **Brown University**, Providence, RI, Invited Speaker (November 2020) “Harnessing Luminescence for Bioimaging and Advanced Materials.”

(40) **University of Texas, Tyler**, Tyler, TX, Invited Speaker (February 2020) “Shaping Light and Matter to Image and Visualize the Chemistry of Life.”

(39) **HP Science Festival**, Highland Park, TX, Invited Speaker (February 2020) “Chemistry of Life: Glowstick Imaging and Volumetric 3D Displays.”

(38) **Foresight Institute: Molecular Machines for Better Materials**, Evanston, IL, Invited Workshop (September 2019)

(37) **Artificial Molecular Switches & Motors Gordon Conference** in Holderness, NH. Invited Discussion Leader (June 2019). “Applications and Entrepreneurship.”

(36) **Second American Gasotransmitter Symposium**, Eugene, OR, Invited Speaker (May 2019), "Chemiluminescent Methods for Imaging Gasotransmitter Species."

(35) **Pittcon**, Philadelphia, PA (March 2019), "Chemiluminescent probes for monitoring reactive sulfur, oxygen, and nitrogen species in living cells and animals."

(34) **University of Rhode Island**, Invited Speaker (November 2018) " Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(33) **Texas A&M**, Invited Speaker, Chemical Biology Division (October 2018) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(32) **Probefest**, HHMI Janelia Farms, Invited Speaker (October 2018) "Chemiluminescent probes for reactive sulfur, oxygen, and nitrogen species."

(31) **University of Puerto Rico**, Invited Speaker (May 2018) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(30) **Stereoscopic Displays and Applications Conference, at IS&T Electronic Imaging** in Burlingame, CA. Invited Speaker (Jan 2018). "Recent progress in volumetric 3D digital light photoactivatable dye displays."

(29) **Advanced Imaging Methods Workshop** in Berkeley, CA. Invited Speaker (Jan 2018). "Recent advances in chemiluminescence imaging."

(28) **Georgia State University**, Invited Speaker (Jan 2018) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(27) **Artificial Molecular Switches & Motors Gordon Conference** in Holderness, NH. Invited Speaker (June 2017). “Advanced photoswitch displays for volumetric 3D image generation.”

(26) **Cornell University**, Invited Speaker (June 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(25) **John Hopkins University**, Invited Speaker (May 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(24) **Perot Museum of Nature and Science**, Social Science "Elemental" Invited Speaker (April 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(23) **First American Gasotransmitter Symposium**, Atlanta, GA, Invited Speaker (April 2017), "From Cells to Humans: Chemical Strategies for Imaging Gasotransmitters and Related Species."

(22) **Baylor University**, Invited Speaker (April 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(21) **Texas Christian University**, Invited Speaker (March 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(20) **University of Texas, Austin**, Invited Speaker (March 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(18) **University of Denver**, Invited Speaker (March 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(17) **Texas A&M**, Invited Speaker, Inorganic Division (March 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(16) **University of Oklahoma**, Invited Speaker (February 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(15) **DFW Young Investigators Symposium**, Invited Speaker (January 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(14) **University of Texas, Arlington**, Invited Speaker (January 2017) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(13) **University of California, Berkeley**, Invited Speaker (November 2016) "Shaping Light and Matter to Image and Visualize the Chemistry of Life."

(12) **American Chemical Society Southwest Regional Meeting in Galveston**, Invited Speaker (November 2016) "Responsive Chemiluminescent Imaging Probes for Whole Animal Imaging."

(11) **The STEMPREP Program at SMU**, Invited Speaker (April 2016) "Shaping Light and Matter to Illuminate the Chemistry of Life."

(10) **Global and Public Health (SMU)**, Invited Speaker (April 2016) "Monitoring Asthma with Smartphones and Glowticks."

(9) **Illinois State University**, Invited Speaker (April 2016) "Shaping Light and Matter to Illuminate the Chemistry of Life."

(8) **Pacifichem**, Invited Speaker (December 2015) "Illuminating Reductase Activity in Hypoxia with Chemiluminescent Probes."

(7) **University of Texas, Dallas**, Invited Speaker (September 2015) "Shaping Light and Matter to Illuminate the Chemistry of Life."

(6) **University of Mississippi**, Invited Speaker (January 2015) "Reaction-based chemical probes for reactive sulfur, oxygen, and nitrogen species."

(5) BME-Cancer Imaging Program Seminar Series, Invited Speaker, **UT Southwestern** (April 2014) "Reaction-based chemical probes for biologically generated sulfur, oxygen, and nitrogen species."

(4) Keck Seminar Series, Invited Speaker, **Rice University** (April 2014) "Reaction-based chemical probes for biologically generated sulfur, oxygen, and nitrogen species."

(3) **American Chemical Society Southwest Regional Meeting in Waco**, Invited Speaker (November 2013) "Reaction-based molecular imaging probes for visualizing disease biomarkers."

(2) **Center for Drug Design, Discovery, and Delivery, SMU**, Invited Speaker (March 2013). “Chemical Probes for Imaging Hydrogen Sulfide and Peroxynitrite in Living Systems.”

(1) **American Peptide Symposium**, Invited Speaker, Young Investigator Lecture (June 2011). “Hydrogen Peroxide Responsive Hyperpolarized ^{13}C MRI Contrast Agents.”

Other Talks and Posters

(18) American Chemical Society National Meeting in San Diego (March 2022). “Cellular and whole animal imaging using 1,2-dioxetanes.”

(17) **Pacifichem** Virtual Meeting (December 2021). “Kinetics-Based and Ratiometric Methods for Quantitative Chemiluminescence Imaging”

(16) International Symposium on Macrocylic and Supramolecular Chemistry in Quebec City, Quebec (July 2018). “Advanced photoswitch displays for volumetric 3D image generation.”

(15) American Chemical Society National Meeting in New Orleans (March 2018). “A beacon in the night: Chemiluminescence probes for biological imaging.”

(14) American Chemical Society National Meeting in San Francisco (April 2017). “Advanced photoswitch displays for volumetric 3D image generation.”

(13) Nitric Oxide Gordon Conference in Ventura, CA (February 2017). “From Cells to Humans: Chemical Strategies for Imaging Reactive Species.”

(12) Bioorganic Gordon Conference in Proctor Academy (June 2016). “From Cells to Humans: Chemical Strategies for Imaging Reactive Species.”

(11) American Chemical Society National Meeting in San Diego (March 2016). “Triggered Energy Transfer Chemiluminescence for In Vivo Imaging.”

(10) American Chemical Society Southwest Regional Meeting in Ft. Worth (November 2014) "Illuminating reactive biomolecules with chemiluminescent probes."

(9) American Chemical Society Southwest Regional Meeting in Ft. Worth (November 2014) "Reactive Nitrogen Species in Stress and Depression."

(8) American Chemical Society National Meeting in San Francisco (August 2014). “Reactive Nitrogen Species in Stress and Depression.”

(7) Bioorganic Gordon Conference in Proctor Academy (June 2014). “Small Molecule Imaging Probes for Reactive Sulfur, Oxygen, and Nitrogen Species.”

(6) Bioorganic Gordon Conference in Proctor Academy (June 2013). “New Fluorescence and Magnetic Resonance Probes for $ONOO^-$.”

(5) UT Southwestern Symposium and Training XXI: Frontiers in Molecular Imaging (May 2013). "Magnetic Resonance Detection of Peroxynitrite Using the Oxidative Decarbonylation of Isatin Derivatives."

(4) Bioorganic Gordon Research Conference (June 2010). “New Reaction-Based Probes for H_2O_2 and O_2^-.”

(3) American Chemical Society National Meeting in San Francisco (March 2010). “Lanthanide-based luminescent probes for hydrogen peroxide.”

(2) American Chemical Society National Meeting in Philadelphia (August 2008). “Functionalized bullvalenes: Adaptive organic molecules.”

(1) American Chemical Society National Meeting in San Francisco (September 2006). “Polysubstituted bullvalone: A base triggered adaptive organic molecule.”

Manuscript, Grant Review, and Professional Service

(1) **Manuscript Review.** Nature Communications, Nature Chemical Biology, Journal of the American Chemical Society, Angewandte Chemie, Chemical Science, Chemical Communications, Chemistry: A European Journal, Organic Letters, Analytical Chemistry, ACS Chemical Biology, ACS Chemical Neuroscience, Free Radicals in Biology and Medicine, Sensors and Actuators B: Chemical, Textile Research Journal, ChemBioChem, Biochimica et Biophysica Acta, Acta Chimica Acta, Tetrahedron Letters, ACS Applied Materials & Interfaces, Photochemical & Photobiological Sciences, Scientific Reports, Organic & Biomolecular Chemistry, Synlett, Talanta, Journal of Luminescence, RSC Advances, ACS Central Science, Nanoscale, Analyst

(2) **Grant Review.** National Science Foundation, European Research Council, ACS Petroleum Research Fund, Human Science Frontiers Program

(3) Chair for the "Advanced Materials Technologies, Systems & Processes" Session of the Organic Chemistry Division at the 253rd American Chemical Society National Meeting in San Francisco in April 2017.

(4) Chair for the "Biologically Related Molecules and Processes" Session of the Organic Chemistry Division at the 248th American Chemical Society National Meeting in San Francisco in April 2017.

(5) Organizer for the 51st Annual DFW ACS Meeting-in-Miniature at SMU in April 2018.

(6) Elected Vice Chair of the 2023 Artificial Molecular Switches & Motors Gordon Conference.

(7) Department Director of Diversity and Inclusion

(8) Founding Member of SMU Association for Asian and Pacific American Scholars and Allies (AAPASA)

Courses Taught at Southern Methodist University

(6)	Modern Physical Organic Chemistry Spring 2018, Spring 2019, Spring 2021, Spring 2022	CHEM 6313 & 4313
(5)	Mechanisms in Organic, Bioorganic, and Organometallic Chemistry Fall 2016	CHEM 5308
(4)	Advanced Inorganic Laboratory Fall 2016	CHEM 5192
(3)	Organic Chemistry II Summer 2015, Spring 2016, Spring 2017, Summer 2017, Spring 2018, Summer 2018, Spring 2020	CHEM 3372
(2)	Organic Chemistry I Fall 2013, Spring 2014, Fall 2014, Spring 2015, Summer 2015, Fall 2015, Fall 2017, Fall 2018, Fall 2019, Fall 2020	CHEM 3371
(1)	Modern Aspects of Chemistry Fall 2012, Fall 2013, Fall 2014, Fall 2015	CHEM 6220

Students Mentored at Southern Methodist University

Current Postdoctoral Scholars

(1) Dr. Husain Kagalwala

Current Graduate Students

(5) Gen Chen, 1st year PhD student

(4) Rokia Osman, 1st year PhD student

(3) Joshua Plank, 2nd year PhD student

(2) Uroob Haris, 4th year PhD student

(1) Bo Li, 5th year PhD student

Current Undergraduate and High School Students

(8) Hillary Ndongo, Prairie View A&M Summer REU

(7) Chancellor Smith, Junior

(6) Mary Clayton, Junior

(5) Trish Elliott, Junior

(4) Caleb Griffin, UT Tyler Summer REU

(3) Tate Reeves, Junior

(2) Minaz Zad, post-baccalaureate

(1) Lisa Kim, post-baccalaureate

Alumni

(32) Maha Aljowni (Ph. D. 2021)

(31) Joey Cascone (B.S. 2021)

(30) Andrew Nakatsuka (B.S. 2021)

(29) Daphne Nguyen (B.S. 2021), medical school at UT San Antonio

(28) Katie Binkley, UT Tyler REU, 2020

(27) Lyn Mouhaffel (B.S. 2020)

(26) Jemimah Zambili (B.S. 2020), optometry school, San Antonio

(25) Umyeena Bashir (B.S. 2020), Master's program, University of San Francisco

(24) Lucas Scott Ryan (Ph.D. 2020), Scientist at EcoLab

(23) Umyeena Bashir (B.S. 2020), Masters student at University of San Francisco

(22) Cecilia O'Brien (High School Student), Undergraduate at Notre Dame University

(21) Briley Fleitman, (M.S., 2019)

(20) Weiwei An, (Ph.D., 2019), Postdoc at Purdue University (Advisor: Prof. Daniel Flaherty)

(19) Becky Jenkins, (B.S., 2019), PhD Program in Chemistry at UCLA

(18) Serene Zidan, (B.S., 2019)

(17) Justin Musser, (B.S., 2018)

(16) Anthony Spearman, (B.A., 2018), PhD program in Chemistry at UCLA (Advisor: Prof. Ellen Sletten)

(15) Natalie Focht, (B.A., 2018)

(14) Jian Cao (Ph.D., 2018), Scientist at Promega

(13) Shreya Patel, (B.S., 2017), PhD program in Chemistry at UCLA (Advisor: Prof. Sarah Tolbert)

(12) Stefan Raicevic, (B.S., 2017), Medical School at Texas Tech

(11) Audrey Reeves, (B.S., 2017), PhD program in Chemistry at UC Berkeley (Advisor: Prof. Chris Chang)

(10) Miguel Quimbar, (B.A., 2017), Scientist at BD Biosciences

(9) Sara Merrikhihaghi Lange (M.S., 2016)

(8) Tristan Smyth (B.S., 2016), Medical School, Arkansas

(7) Natanael Corsino, Visting Scholar, University of Puerto Rico

(6) Siti Nur Sarah Morris (M.S., 2015) PhD Program at UC Berkeley

(5) Jock Thacker (B.S., 2015) Medical School at St. George's University

(4) Kevin Bruemmer (B.S., 2014) Postdoc at Stanford University (Advisor: Prof. Carolyn Bertozzi)

(3) Christina Lollar, B.S. (B.S., 2014), PhD program in Chemistry at Texas A&M (Advisor: Prof. Hongcai Zhou)

(2) Katherine Krenek, (B.S., 2014) Orthopedic Surgery Resident, Minnesota

(1) Julian Spearman, (B.A., 2014) High School Chemistry Teacher