Curriculum Vitae

Neal K. Devaraj Ph. D.
Assistant Professor of Chemistry and Biochemistry, University of California, San Diego

Positions

2011-Present University of California, San Diego, La Jolla CA — Assistant Professor
2007-2011 Harvard Medical School, Boston, MA — Postdoctoral Fellow
2002-2007 Stanford University, Stanford, CA — Ph.D. Chemistry
1998-2002 Massachusetts Institute of Technology, Cambridge, MA — B. S. Chemistry & B. S. Biology

Awards/Honors

2014 - Royal Society of Chemistry Emerging Investigator
2013 - NSF CAREER Award
2013 - Department of Defense MURI Award
2012 - Thieme Chemistry Journal Award
2010 - NIH Research Scientist Career Development Award
2007 - American Chemical Society Young Investigator Award Division of Inorganic Chemistry
2005 - NSF East Asia and Pacific Summer Institutes Award
2002 - Stanford Graduate Fellowship
2002 - MIT Department of Chemistry Alpha Chi Sigma Undergraduate Research Award

Peer Reviewed Publications

29. H. Wu, B. T. Cisneros, C. M. Cole, N. K. Devaraj "Bioorthogonal Tetrazine-Mediated Transfer Reactions Facilitate Reaction Turnover in the Nucleic Acid-Templated Detection of microRNA," *J. Am. Chem. Soc.*, 2014, ASAP, DOI: 10.1021/ja510839r.

28. R. J. Brea, C. M. Cole, N. K. Devaraj "In situ Vesicle Formation by Native Chemical Ligation," *Angew. Chem. Int. Ed.*, 2014, 53(51), 14102-14105.

27. H. Wu, J. Yang, J. Šečkutė, N. K. Devaraj "In-situ Synthesis of Alkenyl Tetrazines for Highly Fluorogenic Bioorthogonal Live Cell Imaging Probes," *Angew. Chem. Int. Ed.*, 2014, 53 (23), 5805-5809.

26. B. Nichols, Z. Qin, J. Yang, D. R. Vera, N. K. Devaraj "^{68}Ga Chelating Bioorthogonal Tetrazine Polymers for the Multistep labeling of Cancer Biomarkers," *Chem. Comm.*, 2014, 50 (40), 5215-5217.

25. J. Yang, Y. Liang, J. Seckute, K. Houk, N. K. Devaraj "Synthesis and Reactivity Comparisons of 1-Methyl-3-Substituted Cyclopropene Minitags for Tetrazine Bioorthogonal Reactions," *Chem. Eur. J.* , 2014, 20 (12), 3365-3375.

24. J. Seckute, N. K. Devaraj “Expanding Room for Tetrazine Ligations in the In Vivo Chemistry Toolbox,” *Curr. Opin. Chem. Biol.*, 2013, 17(5), 761-767.

23. J. Seckute, J. Yang, N. K. Devaraj “Rapid Oligonucleotide-Templated Fluorogenic Tetrazine Cycloadditions,” *Nucl. Acids Res*., 2013, 41(15) e148.

22. C.M. Cole, J. Yang, J. Šečkutė, N. K. Devaraj, “Fluorescent Live−Cell Imaging of Metabolically Incorporated Unnatural Cyclopropene−Mannosamine Derivatives,” *ChemBioChem*, 2013, 14(2), 205-208.

21. N. K. Devaraj, “Advancing Tetrazine Bioorthogonal Reactions through the Development of New Synthetic Tools," *Synlett.*, 2012, 23(15): 2147-2152.

20. J. Yang, J. Seckute, C. M. Cole, N. K. Devaraj "Live-Cell Imaging of Cyclopropene Tags with Fluorogenic Tetrazine Cycloadditions," *Angew. Chem. Int. Ed.*, 2012, 51(30), 7476-7479.

19. J. Yang, M. R. Karver, W. Li, S. Sagu, N. K. Devaraj “Metal-Catalyzed One-Pot Synthesis of Tetrazines Directly from Aliphatic Nitriles and Hydrazine,” *Angew. Chem. Int. Ed.*, 2012, 51(21), 5222-5225.

18. I. Budin, N. K. Devaraj “Membrane Assembly Driven by a Biomimetic Coupling Reaction,” *J. Am. Chem. Soc*., 2012, 134(2), 751-753.

17. N. K. Devaraj, G. M. Thurber, E. J. Keliher, B. Marinelli, R. Weissleder, “Reactive Polymer Enables Efficient In Vivo Chemistry,” *Proc. Nat. Acad. Sci. USA*, 2012, 109 (13), 4762-4767.

16. N. K. Devaraj, R. Weissleder “Biomedical Applications of Tetrazine Cycloadditions,” *Acc. Chem. Res.*, 2011, 44(9), 816-827.

15. J. B. Haun, N. K. Devaraj, B. S. Marinelli, H. Lee, R. Weissleder “Probing Intracellular Biomarkers and Mediators of Cell Activation Using Nanosensors and Bioorthogonal Chemistry” *ACS Nano,* 2011, 5 (4), 3204-3213.

14. J. B. Haun, N. K. Devaraj, S. A. Hilderbrand, H. Lee, R. Weissleder “Bioorthogonal Chemistry Amplifies Nanoparticle Binding and Enhances Signal Detection” *Nature Nanotech,* 2010, 5(9), 660-5.

13. H. S. Han, N. K. Devaraj, J. Lee, S. A. Hilderbrand, R. Weissleder, M. G. Bawendi “Development of a Bioorthogonal and Highly Efficient Conjugation Method for Quantum Dots Using Tetrazine Norbornene Cycloaddition” *J. Am. Chem. Soc*., 2010, 132(23), 7838-9.

12. N. K. Devaraj, S. A. Hilderbrand, R.Upadhyay, R. Mazitschek, R. Weissleder "Bioorthogonal Turn-On Probes for Imaging Small Molecules Inside Living Cells" *Angew. Chem. Int. Ed.*, 2010, 49(16), 2869-2872.

11. N. K. Devaraj, R. Upadhyay, J. B. Haun, S. A. Hilderbrand, R. Weissleder "Fast and Sensitive Pretargeted Labeling of Cancer Cells via Tetrazine/*Trans*-Cyclooctene Cycloaddition" *Angew. Chem. Int. Ed.*, 2009, 48(38), 7013-7016.

10. N. K. Devaraj, E. J. Keliher, G. M. Thurber, M. Nahrendorf, R. Weissleder "^{18}F Labeled Nanoparticles for *in-vivo* PET-CT Imaging" *Bioconjugate Chem.*, 2009, 20(2) 397-401.

9. N. K. Devaraj, R. Weissleder, S. A. Hildebrand "Tetrazine-Based Cycloadditions: Application to Pretargeted Live Cell Labeling" *Bioconjugate Chem.*, 2008, 19(12), 2297-2299.

8. N. K. Devaraj, J. P. Collman, "Copper Catalyzed Azide-Alkyne Cycloadditions on Solid Surfaces: Applications and Future Directions" *QSAR and Comb. Sci.*, 2007, 26(11), 1253-1260.

7. J. P. Collman; R. A. Decreau; Y. Yan; Y. Yang; N. K. Devaraj, "Synthesis of Cytochrome c Oxidase Models that can be Covalently Attached onto Electrode Surfaces" *J. Org. Chem.*, 2007, 72(8), 2794-2802.

6. J. P. Collman, N. K. Devaraj, R. A. Decreau, Y. Yang, Y. Yan, W. Ebina, T. A. Eberspacher, C. E. D.Chidsey, "A Cytochrome *c* Oxidase Model Catalyzes the Four-Electron Reduction of Oxygen under Rate-Limiting Electron Flux" *Science*, 2007, *315*, 5818, 1565-1568.

5. N. K. Devaraj, R. A. Decreau, J. P. Collman, C. E. D. Chidsey, "Rate of Interfacial Electron Transfer Through the 1,2,3-Triazole 'Click' Linkage," *J. Phys. Chem. B.*, 2006, 110(32), 15955-15962.

4. J. P. Collman, N.K. Devaraj, T. A. Eberspacher, C. E. D. Chidsey, "Mixed Azide-terminated Monolayers; A Platform for Modifying Electrode Surfaces," *Langmuir*, 2006, 22(6), 2457-2464.

3. N. K. Devaraj, P. H. Dinolfo, C. E. D. Chidsey, J. P. Collman, "Selective Functionalization of Independently Addressable Microelectrodes by Electrochemical Activation and Deactivation of a Coupling Catalyst," *J. Am. Chem. Soc.*, 2006, 128 (6), 1794 -1795.

2. N. K. Devaraj, G. P. Miller, W. Ebina, B. Kakaradov, J. P. Collman, E. T. Kool, C. E. D. Chidsey, "Chemoselective Coupling of Oligonucleotides to Self Assembled Monolayers," *J. Am. Chem. Soc.*, 2005, 127(24), 8600-8601.

1. J. P. Collman, N. K. Devaraj, C. E. D. Chidsey, "Clicking Functionality onto Electrode Surfaces," *Langmuir*, 2004, (20), 1051-1053.

Book Chapters

1. N. K. Devaraj, R. Weissleder, “Click Chemistry”: Applications to Molecular Imaging" *Molecular Imaging Principles and Practice*, Eds. R. Weissleder, B. D. Ross, A. Rehemtulla, S. S. Gambhir, 2010, Chapter 29.

Current Research Funding

1. W911NF-13-1-0383, Department of Defense (Army Research Office), Multidisciplinary University Research Initiative (MURI), “Dynamic Artificial Cells Composed of Synthetic Bioorthogonal Membranes,” 09/01/2013-08/31/2018, $6,250,000, Role: PI

2. K01EB010078, National Institutes of Health, Mentored Career Development Award (K01), “Fast In Vivo Click Chemistries for PET Imaging,” 05/10/2010-04/30/2015, $880,903, Role: PI

3. CHE-1254611, National Science Foundation, CAREER Award, “Vesicle Growth Driven by Catalytic Lipid Synthesis,” 09/01/2013-08/31/2018, $650,000, Role: PI

4. W9132T-14-2-0002, Department of Defense (Army Corps of Engineers), Cooperative Agreement, “Controlling Functional Group Architecture in Artificial Cells,” 03/01/2014-02/28/2017, $180,000, Role: PI