

Khiem V. Nguyen, Ph.D

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EDUCATION

Ph.D., Biological Chemistry (2007-2012) University of Utah
B.S., Chemistry (2001-2005) Vietnam National University

SKILLS and EXPERTISE

Molecular Biology: PCR, RT-PCR, RNA Aptamer, DNA microarray, Next-Generation Sequencing, Protein Engineering
Bioanalytical Chemistry: HPLC (*reversed phase and ion-exchange*), UPLC, LC-MS
Nucleic Acid Chemistry: Photoredox chemistry of modified nucleoside, DNA oxidative damage, Synthesis of modified nucleosides, DNA nanotechnology
Bioelectrochemistry: Biofuel Cell, Electrochemical Biosensor, Redox hydrogel polymers
Statistics: Regression models, ANOVA, MANOVA, Data Mining
Statistical software: R, SAS, Minitab

EXPERIENCE

Principal Investigator (2016-present) Nguyen Tat Thanh University
Research topics: Biofuel cell, Biosensor, Molecular diagnosis
Postdoctoral Fellow (2013-2015) University of Utah
Research topics: Biofuel cell, Protein engineering, DNA nanotechnology
Postdoctoral Associate (2012-2013) University of California, Berkeley
Research topics: Riboswitch, RNA labelling, Organic synthesis
Research Assistant (2006-2012) University of Utah
Research topics: DNA oxidative damage, DNA photoredox chemistry, Prebiotic Chemistry

PUBLICATIONS

Peer-reviewed Papers

- Lin Xia, [Khiem Van Nguyen](#), Yaovi Holade, Han Han, Kevin Dooley, Plamen Atanassov, Scott Banta, and Shelley D. Minter, "Improving the Performance of Methanol Biofuel Cells Utilizing an Enzyme Cascade Bioanode with DNA-Bridged Substrate Channeling", *ACS Energy Lett.*, **2017**, 2, 1435–1438
- [Khiem V. Nguyen](#), Shelley D. Minter, "DNA redox hydrogels: Improving mediated enzymatic bioelectrocatalysis", *ACS Catalysis*, **2016**, 6, 2603-2607

12. Khiem V. Nguyen, Shelley D. Minter, "Investigating DNA hydrogels as a new biomaterial for enzyme immobilization in biobatteries", *Chem. Comm.*, **2015**, *51*, 13071-13073. (**Featured on the front cover of the issue**)
11. Yuyuan Zhang, Jordan Dood, Ashley Beckstead, Xi-Bo Li, Khiem V. Nguyen, Cynthia J. Burrows, Roberto Improta, and Bern Kohler.; "Photoinduced Electron Transfer in DNA: Charge Shift Dynamics Between 8-Oxo-Guanine Anion and Adenine", *J. Phys. Chem B.*, **2015**, *119*, 7491-7502.
10. Khiem V. Nguyen, Shelley D. Minter, "DNA-Functionalized Pt nanoparticles as catalyst for chemically powered micromotor: Toward signal-on motion-based DNA biosensor", *Chem. Comm.*, **2015**, *51*, 4782-4784.
9. Nguyen, K.V.; Giroud, F.; Minter, S.D.; "Improved bioelectrocatalytic oxidation of sucrose in a biofuel cell with an enzyme cascade assembled on a DNA scaffold", *J. Electrochem. Soc.*, **2014**, *161*, H930-H933.
8. Yuyuan Zhang, Jordan Dood, Ashley Beckstead, Xi-Bo Li, Khiem V. Nguyen, Cynthia J. Burrows, Roberto Improta, and Bern Kohler.; "Efficient UV-induced charge separation and recombination in an 8-oxoguanine-containing dinucleotide", *Proc. Natl. Acad. Sci. USA.*, **2014**, *111*, 11612-11617.
7. Nguyen, K.V.; Burrows, C.J.; "Whence flavins? Redox-active ribonucleotides link metabolism and genome repair to the RNA world", *Acc. Chem. Res.*, **2012**, *45*, 2151-2159. (**Contribution to the Special Issue "Origins of Chemical Evolution"**).
6. Nguyen, K.V.; Burrows, C.J.; "Photorepair of cyclobutane pyrimidine dimers by 8-oxopurine nucleosides", *J. Phys. Org. Chem.*, **2012**, *25*, 574-577. (**Contribution to the Special Issue "New Directions in Physical Organic Chemistry", part of the issue front cover**).
5. Nguyen, K.V.; Burrows, C.J.; "A prebiotic role for 8-oxoguanosine as a flavin mimic in pyrimidine dimer photorepair", *J. Am. Chem. Soc.*, **2011**, *133*, 14586-14589 (**This article was featured in C&E News, 2011, 38, 7**).
4. Nguyen, K.V.; Muller, J.G.; Burrows, C.J.; "Oxidation of 9- β -D-ribofuranosyl uric acid by one-electron oxidants versus singlet oxygen and its implications for the oxidation of 8-oxo-7,8-dihydroguanosine", *Tetrahedron Letters*, **2011**, *52*, 2176-2180
3. Victor, X.V.; Nguyen, T.K.; Ethirajan, M.; Tran, V.M.; Nguyen, K.V.; Kuberan, B.; "Investigating the elusive mechanism of glycosaminoglycan biosynthesis", *J. Biol. Chem.*, **2009**, *284*, 25842-53.
2. Kuberan, B.; Ethirajan, M.; Victor, X.V.; Tran, V.M.; Nguyen, K.V.; Do, A.; "Click" xylosides initiate glycosamino-glycan biosynthesis in a mammalian cell line", *ChemBioChem.*, **2008**, *9*, 198-200.

1. Nguyen Thi Son, Nguyen Van Khiem, Luu Van Boi; “Synthesis and structure of 5-{{4-({4-[(5-mercapto-1,3,4-thiadiazol-2-yl) amino] phenyl}thio) phenyl] amino}-1,3,4-thiadiazole-2-thiol “, *VNU Journal of Science*, **2006**, 3, 25-31.

Book Chapters

1. David P. Hickey, Ross D. Milton, Michelle Rasmussen, Sofiene Abdellaoui, Khiem Nguyen, Shelley D. Minter.; “Fundamentals and Applications of Bioelectrocatalysis”., *Electrochemistry: Volume 13*, **2015**, 13, 97-132., RSC publisher

Patents

1. Kuberan, B.; Ethirajan, M.; Victor, X.V.; Tran, V.M.; Nguyen, K.V.; “Synthesis of novel xylosides and potential uses thereof”, US Patent, US20100143980 A1.

PRESENTATIONS

7. “Incorporating DNA Biomaterial into Enzymatic Biofuel Cell”, *invited talk at Bio-electrochemistry Symposium*, Nguyen Tat Thanh University, Vietnam, June 12, 2017

6. “DNA: From a Biomolecule to a Nanobiomaterial”, Khiem Van Nguyen, *invited talk at Duy Tan University*, Da Nang, Vietnam, March 13, 2016

5. “DNA as a structural scaffold for self-assembly of an enzyme cascade to enhance bioelectrocatalytic activity for fuel cell and battery applications”., Khiem V. Nguyen, Shelley D. Minter, *FNANO 2015*, Snowbird, UT, USA, April 13-16, 2015.

4. “A prebiotic role for oxidized purine nucleosides as mimics of flavins in cyclobutane pyrimidine dimer repair”, Khiem V. Nguyen, Cynthia J. Burrows., *Albany 2011: The 17th conversation*, Albany, NY, USA., June 14-18, 2011 (*poster*).

3. “Redox chemistry of 8-oxopurine nucleosides and their potential role in mitigating photochemical damage in DNA”, Khiem V. Nguyen, James G. Muller, Cynthia J. Burrows., *Annual Bioscience Symposium*, University of Utah, UT, USA, September 28, 2010 (**Best poster award**).

2. “Redox chemistry of 8-oxopurine nucleosides and their potential role in mitigating photochemical damage in DNA”, Khiem V. Nguyen, James G. Muller, Cynthia J. Burrows., *ACS National meeting*, Boston, MA, USA, August 25-28, 2010 (*poster*).

1. “Synthesis and electrochemical property of 5-{{4-({4-[(5-mercapto-1,3,4-thiadiazol-2-yl) amino] phenyl}thio) phenyl] amino}-1,3,4-thiadiazole-2-thiol”, Khiem V. Nguyen, Luu Van Boi., *Scientific conference for undergrad students*, College of Science, Vietnam National University, Hanoi, Vietnam, 2004 (**talk for the best undergraduate research in Chemistry**).

FUNDINGS SUPPORT

NAFOSTED 2016, Fund provided by Vietnamese Government for Science and Technology Development (*Role: PI*)

Viet A Cooperation 2017, Fund provided by Viet A Cooperation to Develop and Commercialize a kit to detect antibiotics in food products (*Role: PI*)

Ministry of Industry and Trade Seed Fund 2016, Fund provided by Vietnam Ministry of Industry and Trade for Bimedtech company to develop diagnostic products based on DNA microarray (*Role: Co-PI*)

Nguyen Tat Thanh University Startup Fund 2016, Fund provided by Nguyen Tat Thanh University for a new faculty (*Role: PI*)