

CURRICULUM VITAE

RYAN J. WHITE

EDUCATION

Ph.D. 2007 University of Utah, Chemistry
B.A. 2003 University of North Carolina, Chapel Hill, Chemistry

Experience in Higher Education

August 2011-Present **University of Maryland Baltimore County**, Baltimore, MD,
Assistant Professor, Chemistry
2007-2011 **University of California Santa Barbara**, Santa Barbara, CA,
NIH-NRSA Postdoctoral Fellow, Chemistry and Biochemistry

Honors Received

2009-2011 NIH-National Research Service Award Postdoctoral
Fellowship
2010 Gordon-Kenan Research Seminar Chair – Gordon Research
Conference in Electrochemistry
2008-2009 Santa Barbara Foundation Tri-Counties Bloodbank
Postdoctoral Fellowship
2007 Gordon Research Conference Travel Award
2006 Graduate Travel Award- University of Utah
2003 The Cal Giddings Graduate Fellowship in Chemistry

Research Support

2014-2016 \$392,614 (direct), source: NIH NIMH, "*Nanoscale Sensors for Direct, Real-Time Monitoring of Gliotransmitter Release*," role: PI
2013-2014 \$20,000 (direct), source: UMBC SRAIS, "*Aptamer-Hydrogel Sensors for Compatible Interfacing with Biology*," role: PI
2013 \$6,000 (direct), source: UMBC Summer Faculty Fellowship, "*Aptamer-Hydrogel Sensors for Compatible Interfacing with Biology*," role: PI
2012-2013 \$20,000 (direct), source: UMBC SRAIS, "*Nanoscale, Electrochemical Sensors for Direct, Real-Time Monitoring of Gliotransmitter Release*," role: PI

2012 \$6,000 (direct), source: UMBC Summer Faculty Fellowship, "Nanoscale, Electrochemical Sensors for Direct, Real-Time Monitoring of Gliotransmitter Release," role: PI

Postdoctoral Fellows

Dr. Juan Liu, January 2013 – Present

Dr. Rotimi Olojo, February 2012 – May 2012

Ph.D. Students

Lauren Schoukroun-Barnes, degree expected 2015, role: Chair

Florika Macazo, degree expected 2016, role: Chair

Master's Students

Melissa E. Dávila Morris, M.S. 2014, role: advisor, research mentor

Kuan-Chun Huang, M.S. 2013, role: advisor, research mentor

Undergraduate Students

Samuillah Wagan, UMBC undergraduate research, September 2011 – July 2014, B.S. Biology 2013, role: research mentor, Current Location: University of St. Louis Medical School

James Taylor, MARC Scholar, UMBC undergraduate research, January 2012 – July 2014, role: research mentor, current location: Chemistry PhD program University of North Carolina

Zoë Spafford, Meyerhoff Scholar, HHMI Scholar, undergraduate research, May 2012 – May 2013, role: research mentor

Brenda Guterrez, UMBC undergraduate research Meyerhoff Scholar, September 2013-Present, role: research mentor

Ethan Glaser, UMBC undergraduate research, January 2014 – Present, role: research mentor

PUBLICATIONS, PRESENTATIONS, AND CREATIVE ACHIEVEMENTS

Peer-Reviewed Works

1. F. C. Macazo and **R. J. White**, "Monitoring Charge Flux to Quantify Unusual Ligand-Induced Ion Channel Activity for use in Biological Nanopore-Based Sensors," *Anal. Chem.* **2014**, *86*, 5519-5525.
2. J. Liu, M. Dávila Morris, F. C. Macazo, L. R. Schoukroun-Barnes, and **R. J. White**, "The Current and Future Role of Aptamers in Electroanalysis," *Invited Critical Review, J. Electrochem. Soc.*, **2014**, *161*, H301-H313.

3. L. R. Schoukroun-Barnes, S. Wagan, and **R. J. White**, "Enhancing the Analytical Performance of Electrochemical RNA Aptamer-Based Sensors for Sensitive Detection of Aminoglycoside Antibiotics," *Anal. Chem.* **2014** *86*, 1131-1137.
4. R. J. Powell, **R. J. White**, R. T. Hill, "Merging Metabolism and Power: Development of a Novel Photobioelectric Device Driven by Photosynthesis and Respiration," *PLOS ONE*, **2014**, *9*, e86518. (*Collaboration with IMET*)
5. K.-C. Huang and **R. J. White**, "Random Walk on a Leash: A Simple Single-Molecule Diffusion Model for Surface-Tethered Redox Molecules with Flexible Linkers," *J. Am. Chem. Soc.* **2013**, *135*, 12808–12817.
6. L. R. Schoukroun-Barnes, S. Wagan, J. Lui, J. B. Leach, and **R. J. White**, "Biocompatible Hydrogel Membranes for the Protection of RNA Aptamer-Based Electrochemical Sensors," *Proc. SPIE*, **2013**, *8719*, 871901-871908.
7. D. Kang, **R. J. White**, F. Xia, X. Zuo, A. Vallée-Bélisle, and K. W. Plaxco, "DNA Biomolecular-Electronic Encoder and Decoder Devices Constructed by Multiplex Biosensors," *Nat. Pub. Group Asia Mater.* **2012**, *4*, 1-6.
8. **R. J. White**, H. M. Kallewaard, K. Hsieh, A. S. Patterson, J. B. Kasehagen, K.J. Cash, T. Uzawa, H. T. Soh, and K. W. Plaxco, "Wash-free, Electrochemical Platform for the Quantitative, Multiplexed Detection of Specific Antibodies," *Anal. Chem.* **2012**, *84*, 1098-1103. Most Read Articles Analytical Chemistry January 2012.
9. A. A. Rowe, A. J. Bonham, **R. J. White**, and K. W. Plaxco, "Fabrication of Electrochemical-DNA Biosensors for the Reagentless Detection of Nucleic Acids, Proteins and Small Molecules," *J. Vis. Exp.* **2011**, *52*, 29221-29226.
10. K. Hsieh, **R. J. White**, B. D. Ferguson, K. W. Plaxco, Y. Xiao, H. T. Soh, "Polarity-Switching Electrochemical Sensor for Specific Detection of Single-Nucleotide Mismatches," *Angew. Chemie. Intl. Ed.* **2011**, *50*, 11176-11180.
11. A. A. Rowe, A. J. Bonham, **R. J. White**, M. P. Zimmer, R. J. Yadgar, T. M. Hobza, I. Yaacov, K. W. Plaxco, "CheapStat: An Open-Source, "Do-It-Yourself" Potentiostat for Analytical and Educational Applications," *PLOS One*, **2011**, *6*, e23783.
12. A. E. Abelow, **R. J. White**, K. W. Plaxco, and I. Zharov, "Nanoporous Silica Colloidal Films with Molecular Transport Gated by Aptamers Responsive to Small Molecules," *Coll. Czech CC* **2011**, *76*, 683-694.
13. T. Uzawa, R. R. Cheng, **R. J. White**, D. Makarov, and K. W. Plaxco, "A Mechanistic Study of Electron Transfer from the Distal Termini of Electrode-Bound, Single-Stranded DNAs," *J. Am. Chem. Soc.* **2010**, *132*, 16120-16126.
14. A. E. Abelow, O. Schepelina, **R. J. White**, A. Vallée-Bélisle, K. W. Plaxco, and I. Zharov, "Biomimetic Glass Nanopores Employing Aptamer Gates Responsive to a Small Molecule," *Chem. Comm.*, **2010**, *46*, 7984-7986.
15. F. Xia, **R. J. White**, X. Zuo, A. Patterson, Y. Xiao, D. Kang, X. Gong, K. W. Plaxco and A. J. Heeger, "An Electrochemical Supersandwich Assay for Sensitive and Selective DNA in Complex Matrices," *J. Am. Chem. Soc.* **2010**, *132*, 14346-14348.
16. F. Xia, X. Zuo, R. Yang, **R. J. White**, Y. Xiao, D. Kang, X. Gong, A. J. Heeger and K. W. Plaxco, "Label-Free, Dual-Analyte Electrochemical Biosensors: A New Class of Molecular-Electronic Logic Gates," *J. Am. Chem. Soc.* **2010**, *132*, 8557-8559.

17. **R. J. White**, A. A. Rowe, and K. W. Plaxco, "Re-engineering Aptamer Constructs for Reagentless, Self-Reporting Electrochemical Sensors," *Analyst* **2010**, *135*, 589-594.
18. **R. J. White** and K. W. Plaxco, "Exploiting Binding-Induced Changes in Probe Flexibility for the Optimization of Electrochemical Biosensors," *Anal. Chem.* **2010**, *82*, 73-76.
19. D. Kang, X. Zuo, R. Yang, F. Xia, K. W. Plaxco and **R. J. White**, "Comparing the Properties of Electrochemical-Based DNA Sensors Employing Different Redox Tags," *Anal. Chem.* **2009**, *81*, 9109-9113.
20. **R. J. White** and K. W. Plaxco, "Engineering New Aptamer Geometries for Electrochemical Aptamer-Based Sensors," *Proc. SPIE* **2009**, 7321-5, 732105-1 – 132105-9.
21. Y. Xiao, K. J. I. Plakos, X. Luo, **R. J. White**, J. Qian, K. W. Plaxco and H. T. Soh, "Fluorescence Detection of Single Nucleotide Polymorphism via a Single, Self-Complementary, Triple-stem DNA Probe," *Angew. Chemie.* **2009**, *121*, 4418-4422.
22. Y. Xiao, T. Uzawa, **R. J. White**, D. DeMartini and K. W. Plaxco, "On The Signaling of Electrochemical, Aptamer-Based Sensors: Collision- and Folding-Based Mechanisms," *Electroanalysis* **2009**, *21*, 1267-1271.
23. A. A. Lubin, B. Vander Stoep Hunt, **R. J. White** and K. W. Plaxco, "The Effects of Probe Length, Probe Geometry and Redox-Tag Placement on the Performance of the Electrochemical E-DNA Sensor," *Anal. Chem.* **2009**, *81*, 2150-2158.
24. N. Phares, R. J. White and K. W. Plaxco, "Improving the Stability and Sensing of Electrochemical Biosensors by Employing Trithiol-Anchoring Groups in a Six-carbon Self-assembled Monolayer," *Anal. Chem.* **2009**, *81*, 1095-1100.
25. E. N. Ervin, **R. J. White**, and H. S. White, "Sensitivity and Signal Complexity as a Function of the Number of Ion Channels in a Stochastic Sensor," *Anal. Chem.* **2009**, *81*, 533-537.
26. **R. J. White**, N. Phares, A. A. Lubin, Y. Xiao, and K. W. Plaxco, "Optimization of Electrochemical Aptamer-Based Sensors via Optimization of Probe Packing Density and Surface Chemistry," *Langmuir* **2008**, *24*, 10513-10518.
27. E. N. Ervin, R. Kawano, **R. J. White**, and H. S. White, "Simultaneous Alternating and Direct Current Readout of Protein Ion Channel Blocking Events using Glass Nanopore Membranes," *Anal. Chem.* **2008**, *80*, 2069-2076.
28. **R. J. White** and H. S. White, "Electrochemistry in Nanometer-Wide Cells," *Langmuir* **2008**, *24*, 2850-2855.
29. **R. J. White**, E. N. Ervin, S. Daniel, T. Yang, P. S. Cremer, and H. S. White, "Single Ion Channel Recordings using Glass Nanopore Membrane Supports," *J. Am. Chem. Soc.* **2007**, *129*, 11766-11775.
30. **R. J. White** and H. S. White, "Influence of Electrophoresis Waveforms in Determining Stochastic Nanoparticle Capture Rates and Detection Sensitivity," *Anal. Chem.* **2007**, *79*, 6334-6349.
31. B. Zhang, J. Galusha, G. Wang, A. J. Bergren, R. M. Jones, **R. J. White**, E. N. Ervin, C. C. Cauley, P. Shiozawa, and H. S. White, "Fabrication of Glass-Sealed Nanodisk Electrodes, Glass Nanopore Electrodes, and Glass Nanopore Membranes," *Anal. Chem.* **2007**, *79*, 4778-4787.

32. E. N. Ervin, **R. J. White**, T. G. Owens, J. M. Tang, and H. S. White, "AC Conductance of Transmembrane Protein Channels. The Number of Charged Residue Counter-ions in Transmembrane Proteins at Infinite Dilution," *J. Phys. Chem. B.* **2007**, *111*, 9165-9171.
33. J. H. Shim, J. Kim, G. S. Cha, H. Nam, **R. J. White**, H. S. White and R. B. Brown, "Glass Nanopore-Based Ion-Selective Electrodes," *Anal. Chem.* **2007**, *79*, 3568-3574.
34. **R. J. White**, B. Zhang, S. Daniel, J. M. Tang, E. N. Ervin, P. S. Cremer and H. S. White, "Ionic Conductivity of the Aqueous Layer Separating a Lipid Bilayer Membrane and a Glass Support," *Langmuir* **2006**, *22*, 10777-10783.
35. **R. J. White** and H. S. White, "Random Walks in Electron Transfer," *Anal. Chem.* **2005**, *77*, 214A-220A. Cover Article.
36. V. L. Jimenez, D. G. Georganopoulou, **R. J. White**, A. S. Harper, A. J. Mills, D. Lee, and R. W. Murray, "A Hexanethiolate Monolayer-Protected 38 Gold Atom Cluster," *Langmuir* **2004**, *20*, 6864-6870.

Other Publications

37. **R. J. White**, "Artificial Receptors for Chemical Sensors: Book Review," *Anal. Bioanal. Chem.* **2011**, *401*, 3053-3056.

Invited Seminars at Universities

1. "Compatibly Interfacing Sensors with Biology," Departmental Seminar, Lebanon Valley College, Annville, PA, November 2014.
2. "Compatibly Interfacing Sensors with Biology," Departmental Seminar, George Washington University, Washington DC, October 2014.
3. "Electrochemical DNA-Based Sensors: From Benchtop to Bedside," Invited Oral Presentation, Hood College, Frederick, MD, October 2012.
4. "Reengineering an Aptamer for use in Electrochemical Aptamer-Based Biosensors," Università di Roma Tor Vergata, October 2009.

Oral Presentations at National/International Conferences

5. (M. Dávila Morris) and **R. J. White**, "Electrochemical DNA-Based Sensors for ATP Monitoring in the Brain," National Society for Advancement of Chicanos and Native Americans in Science (SACNAS) Meeting, San Antonio, TX, October 2013.
6. L. R. Schoukroun-Barnes, S. Wagan, J. Lui, J. B. Leach, and (**R. J. White**), "Interfacing Biosensors with Biology," SPIE Defense, Security, and Sensing, Baltimore, MD, May 2013.
7. K.- C. Huang and (**R. J. White**), "Interfacing Biosensors with Biology," Pittcon, Philadelphia, PA, March 2013, Invited Talk in Organized Contributed Session: Society for Electroanalytical Chemistry - Highlighting Young Investigators.
8. M. Dávila Morris, J. Lui, and (**R. J. White**), "Sensors for Monitoring ATP Release from Glial Cells," Pittcon, Philadelphia, PA, March 2013. Invited Talk in Symposia: New Analytical Techniques for Monitoring ATP and Adenosine.

9. **R. J. White**, "Electrochemical Aptamer-Based Sensors: From Benchtop to Bedside," *Invited Oral Presentation*, American Chemical Society National Meeting, Boston, MA, August 2010. Invited Talk in Special Section: A Half-Century at the Crossroads of Chemistry: In Honor of Royce Murray's 50 Years at Carolina,
10. **R. J. White**, "Electrochemical Aptamer-Based Sensors: From Benchtop to Bedside," Pittcon, Orlando, FL, March 2010. *New Investigators in Analytical Chemistry*.
11. **R. J. White**, "Reengineering an Aptamer for use in Electrochemical Aptamer-Based Biosensors," 4th International Conference on Surfaces, Coatings and Nanostructured Materials, Rome, Italy, October 2009.
12. **R. J. White**, "Folding-Based Electronic Biosensors," Nanoelectronic Devices for Defense and Security Conference, Ft. Lauderdale, FL, September 2009. Invited Talk.
13. **R. J. White**, "Reengineering an Aptamer for use in Electrochemical Aptamer-Based Biosensors," American Chemical Society National Meeting, Washington DC, August 2009.
14. **R. J. White**, "Engineering New Aptamer Geometries for Electrochemical Aptamer-Based Sensors," SPIE Defense, Security and Sensing, Orlando, FL, April 2009.
15. **R. J. White**, "Glass Nanopore Membranes as a Support for Single Ion Channel Recordings," California Nanosystems Institute Seminar Series, Santa Barbara, CA, December 2008. Invited Presentation.
16. (**R. J. White**), N. Phares, A. A. Lubin, and K. W. Plaxco, "Optimizing Electrochemical Aptamer-Based Sensors," 2008 Materials Research Society Fall Meeting, Boston, MA, December 2008.

Oral Presentations at Regional Conferences/Symposia

17. (J. Taylor), **R. J. White**, "Characterizing Self-Assembled Monolayers on Microelectrode Surfaces," Undergraduate Research and Creative Achievement Day, Baltimore, MD, April 2013.
18. (M. Dávila Morris), **R. J. White**, "The Effects of Self-Assembled Monolayer Formation on the Performance of Electrochemical DNA-Based Sensors," UMBC Graduate Research Conference, Baltimore, MD, February, 2013.
19. **R. J. White**, "Electrochemical DNA-Based Sensors: From Benchtop to Bedside," Mid-Atlantic Regional Meeting, American Chemical Society, Baltimore, MD, June 2012.
20. (**R. J. White**), N. Phares, and K. W. Plaxco, "Optimizing Electrochemical Aptamer-Based Sensors," 42nd Annual Western Regional Meeting of the American Chemical Society, Las Vegas, NV, September 2008.

Poster Presentations at National/International Conferences

21. (Z. Spafford), **R. J. White**, "Bio-Inspired, Ligand Gated Solid State Nanopores," National Annual Biomedical Research Conference for Minority Students, San Jose, CA, November 2012.

22. (M. Dávila Morris), **R. J. White**, "Improving the Signaling, Sensitivity, and Affinity of Electrochemical Aptamer-Based Sensors by using Ultra Micro Electrodes," National Science Foundation, Annual Joint Meeting, Washington, DC, June 2012.

Poster Presentations at Regional Conferences/Symposia

23. (J. Taylor), **R. J. White**, "A LabVIEW Based Approach to Electrochemical Analysis," Summer Undergraduate Research Festival, Baltimore, MD, August 2013.
24. (S. Wagan), **R. J. White**, "Biocompatible Hydrogel Coated Electrodes for Long Term In Vivo Sensing," Undergraduate Research and Creative Achievement Day, Baltimore, MD, April 2013.
25. (M. Dávila Morris), **R. J. White**, "Nanoscience, Electrochemistry, and the Biological Interface," A Look Ahead Symposium XVI, Baltimore, MD, April 2013.
26. (M. Dávila Morris), **R. J. White**, "Improving the Signaling, Sensitivity, and Affinity of Electrochemical Aptamer-Based Sensors by using Ultra Micro Electrodes," Mid-Atlantic Regional Meeting, American Chemical Society, Baltimore, MD, June 2012
27. (M. Dávila Morris), **R. J. White**, "Improving the Signaling, Sensitivity, and Affinity of Electrochemical Aptamer-Based Sensors by using Ultra Micro Electrodes," UMBC Graduate Research Conference, Baltimore, MD, April 2012.
28. (J. Taylor), **R. J. White**, "Monitoring Mixed Self Assembled Monolayer Formation on Micro- and Nano- Electrodes for Electrochemical DNA-Based Sensors," Undergraduate Research and Creative Achievement Day, Baltimore, MD, April 2012.

SERVICE

Departmental Activities

Spring 2013	Organization of "How to Write a NSF Graduate Fellowship Workshop" Series
Winter 2013	Just for Juniors (departmental representative)
Fall 2011 – Present	Graduate Student Recruiting Committee (member)
Spring 2012	Departmental Seminar Series (organization and scheduling)

University Activities

August 2013	New Faculty Welcome ("Advice for new faculty from former new faculty" panelist)
February 2013	2013 UMBC Annual Graduate Research Symposium (judge)
October 2012	15 th Annual Undergraduate Research Symposium in the Chemical and Biological Sciences (judge)

October 2011

14th Annual Undergraduate Research Symposium in the
Chemical and Biological Sciences (judge)

Advisee Students: 11 Undergraduate chemistry majors

Ph.D./M.S. Student's Committees Served/Serving On:

Robert Wimmer	Ph.D. Committee Member (University of Maryland, Baltimore, Biochemistry)
William Cunning	Ph.D. Committee Member (Chem/Biochem)
Nicole Carbonaro	Ph.D. Committee Member (Chem/Biochem)
Gregory Winter	Ph.D. Committee Member (Chem/Biochem)
Johan Melendez	Ph.D. Committee Member (Chem/Biochem)
Melissa Dávila Morris	Ph.D. Committee Chair/Advisor (Chem/Biochem)
Lauren Schoukroun-Barnes	Ph.D. Committee Chair/Advisor (Chem/Biochem)
Delauren McCauley	Ph.D. Committee Member (Chem/Biochem)
Anand Sundaram	Ph.D. Committee Member (Chem/Biochem)
Kweku Amoag	M.S. Committee Member (Comp Sci)
Florika Macazo	Ph.D. Committee Member/Advisor (Chem/ Biochem)
Scott Riley	Ph.D. Committee Member (Chem/Biochem)
Pietro Strobina	Ph.D. Committee Member (Chem/Biochem)
Evgenia Barannikova	Ph.D. Committee Member (Chem/Biochem)
Scott Riley	Ph.D. Committee Member (Chem/Biochem)

Professional Activities

May 2013	Session Chair, "Electrochemical and Noninvasive Sensing for Rapid Patient Monitoring" at SPIE Defense, Security, and Sensing 2013, Baltimore, MD.
May 2013	Session Chair, "Smart Materials for Biorecognition and Biosensing," at SPIE Defense, Security, and Sensing 2013
June 2012	Session Chair, "Bioanalytical Sensors," at Mid-Atlantic Regional Meeting of the American Chemical Society
January 2010	Gordon Kenan Research Seminar Chair – Gordon Research Conference in Electrochemistry

Affiliations

2006-Present	The American Chemical Society
2008-09	Materials Research Society

2009-Present Society for Electroanalytical Chemistry
2012-Present American Association for the Advancement of Science

Manuscript Reviewer for:

Journal of the American Chemical Society
Analytical Chemistry
Langmuir
Nucleic Acids Research,
Angewandte Chemie
Bioelectrochemistry
Sensors
Electrochimica Acta
Journal of the Electrochemical Society
NanoBioScience
Nature

Grant Reviewer For:

National Science Foundation (Chemical Measurements and Imaging)
Army Research Office (Life Sciences Division)

I certify that this document is accurate and true.

Ryan J. White

August 13, 2014