

ALEXANDER G. ZESTOS

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EDUCATION

- May 2014 **Doctor of Philosophy (Ph.D) in Chemistry**
The University of Virginia, Charlottesville, VA
- June 2008 **Master of Science (M.S.) in Chemistry**
The College of William and Mary, Williamsburg, VA
- May 2007 **Bachelor of Science (B.S.) in Chemistry with Honors**
The College of William and Mary, Williamsburg, VA

RESEARCH AND TEACHING EXPERIENCE

- Aug. 2017 – present **Assistant Professor**
Department of Chemistry, American University, Washington D.C.
Joint affiliation in the Behavior, Cognition, and Neuroscience Program (BCAN) and Center for Behavioral Neuroscience (CBN)
- Aug. 2014 – Jul. 2017 **Postdoctoral Research Fellow**
University of Michigan, Depts. of Chemistry and Pharmacology
Advisors - Profs. Robert T. Kennedy and Margaret E. Gnegy
- Aug. 2009 – May 2012 **Teaching Assistant**
Department of Chemistry, The University of Virginia, Charlottesville, VA
- Aug. 2009 – Aug. 2014 **Graduate Research Assistant**
Department of Chemistry, The University of Virginia, Charlottesville, VA
- Jan. 2006 – Aug. 2008 **Research Assistant**, Department of Chemistry
The College of William and Mary, Williamsburg, VA

PUBLICATION LIST

Publications at American University

1. S. Mohanaraj, P. Wonnenberg, B. Cohen, H. Zhao, M. Hartings, S. Zou, D.M. Fox, and **A.G. Zestos**. “Gold Nanoparticle Modified Microelectrodes Enhance Neurotransmitter Detection.” Submitted to *JOVE*.
2. D. Raju, A. Mendoza, S. Mohanaraj, P. Wonnenberg, M. Sarbanes, C. Truong, and **A.G. Zestos**. “Polymer modified Carbon Fiber-Microelectrodes and Waveform Modifications Enhance Neurotransmitter Metabolite Detection.” Submitted to *Analytical Methods*.
3. **A.G. Zestos**, D. Raju, A. Mendoza. “Novel Electrode Materials for Neurotransmitter Metabolite Detection.” Submitted to *2019 IEEE International Instrumentation and Measurement Technology Conference (I2MTC)*.
4. **A.G. Zestos**, C. Carpenter, M. Low, R.T. Kennedy, and M.E. Gnegy “Riboxistaurin Reduces Cocaine-stimulated Increases in Extracellular Dopamine by Modifying Dopamine-Autoreceptor Activity.” Accepted ASAP. *ACS Chemical Neuroscience*.
5. H. Munguia, **A.G. Zestos**, S. Gliske, R.T. Kennedy, W.C. Stacey “Chemical biomarkers of epileptogenesis and ictogenesis in experimental epilepsy.” Accepted ASAP *Neurobiology of Disease*.
6. **A.G. Zestos** and B.J. Venton “Carbon Nanotube Fiber Microelectrodes for High Temporal Measurements of Dopamine.” *Journal of the Electrochemical Society (JECS)* **2018** 165(12): G3074-G307.
7. **A.G. Zestos**, H. Munguia, W.C. Stacey, and R.T. Kennedy “Use and Future Prospects of In Vivo Microdialysis for Epilepsy Studies.” Accepted ASAP *ACS Chemical Neuroscience*.
8. H. Jun, H. Yu, J. Gong, J. Jiang, D. Kim, M.P. Emont, **A.G. Zestos**, E. Perkey, J. Liu, I. Maillard, R.T. Kennedy, X.Z. Xu, and J. Wu. “An immune-beige adipocyte communication via nicotinic acetylcholine receptor signaling.” *Nature Medicine*. **2018** 24(6): 814-822.
Recommended by the Faculty of 1000.
9. **A.G. Zestos**. “Carbon-Nano Electrodes for the Electrochemical Detection of Neurotransmitters.” Accepted ASAP. *Int. J. of Electrochem.* 2018. 1-20.

10. **A.G. Zestos** and B.J. Venton "Carbon Nanotube-based microelectrodes for enhanced neurochemical detection." *ECS Trans.* **2017**, 80(10): 1497-1509.
11. **A.G. Zestos**, M.E. Gnegy, R.T. Kennedy. "LC-MS Method to Detect Neurotransmitters In Vivo During Period of Drug Abuse." *254th American Chemical Society National Meeting Proceedings*, August 2017.
12. **A.G. Zestos** and R. T. Kennedy. "Microdialysis Coupled with LC-MS/MS for In Vivo Neurochemical Monitoring." *The AAPS Journal.* **2017**,19(5): 1284-1293.
13. C. Carpenter, **A.G. Zestos**, R. Altshuler, R. Sorenson, B. Guptaroy; E. Jutkiewicz, R.T. Kennedy, H. Showalter; M. Gnegy. "CNS-Permeant Tamoxifen Analog Modulates The Dopamine Transporter and Reduces Amphetamine Reinforcing Effects." *The FASEB Journal.* **2017**, 31. 986-986.7.
14. C.A. Carpenter*, **A.G. Zestos*** (equal contribution), R. Sorenson, B. Guptaroy, H. Showalter, R. Kennedy, E. Jutkiewicz, M. Gnegy. "Direct and systemic application of a CNS-permeant tamoxifen analog reduces amphetamine-induced dopamine release and reinforcing effects." *Neuropsychopharmacology* **2017** 42, 1940–1949.
15. C. Carpenter, R. Altshuler, **A.G. Zestos**, R. Sorenson, E Jutkiewicz, R. Kennedy, M. Gnegy " New generation tamoxifen analogs as potential scaffolds for amphetamine abuse." *Drug and Alcohol Dependence*, Vol.171. 2017.

Prior Publications

16. **A.G. Zestos**, S.R. Mikelman, R.T. Kennedy, M.E. Gnegy "PKC β inhibitors attenuate amphetamine- and cocaine-stimulated dopamine release." *Intrinsic Activity.* 4, **2016**, doi:10.25006/IA.4.S2-A18.112.
17. C. Carpenter, **A.G. Zestos**, R. Sorenson, R.T. Kennedy, H. Showalter, M.E. Gnegy "A tamoxifen analog is an asymmetric dopamine transporter modulator and reduces amphetamine effects *in vivo*." *Intrinsic Activity.*, 4, **2016**, doi:10.25006/IA.4.S2-A18.66.
18. **A.G. Zestos**, S.R. Mikelman, R.T. Kennedy, M.E. Gnegy "PKC β Inhibitors Attenuate Amphetamine-Stimulated Dopamine Efflux." *ACS Chem. Neuosci.* **2016**, 7, 757–766.
19. C. Carpenter, R. Altshuler, **A. Zestos**, R. Sorenson, R. Kennedy, E. Jutkiewicz, H. Showalter, M. Gnegy, Revisiting the Tamoxifen Scaffold for Therapeutics Against Amphetamine Abuse, *The FASEB Journal*, 30, **2016**, 1183-1187.
20. C. Yang, C. Jacobs, M. Ganesana, M. Nguyen, **A.G. Zestos**, I. Ivanov, A. Poretzky, C. Rouleau, D. Geohegan, B.J. Venton. "Carbon Nanotubes Grown on Metal Microelectrodes for the Detection of Dopamine." *Anal. Chem.* **2016**, 88, 645–652.
21. **A.G. Zestos**, C. Yang, C.B. Jacobs, D. Hensley, B.J. Venton "Carbon Nanospikes Grown on Metal Wires as Microelectrode Sensors for Dopamine." *Analyst*, **2015**, 140, 7283-7292.
22. **A. G. Zestos**, C. Jacobs, E. Triantopoulos, A.E. Ross and B. J. Venton "Polyethyleneimine Carbon Nanotube Fiber Microelectrodes For Enhanced Neurotransmitter Detection." *Anal. Chem.*, **2014**, 86 (17), 8568–75.
23. C.B. Jacobs., I. Ivanov, M.D. Nguyen, **A.G. Zestos**, B.J. Venton. "High Temporal Resolution Measurements of Dopamine with Carbon nanotube Yarn Microelectrodes." *Anal. Chem.*, **2014**, 86 (12), 5721–5727.
24. **A.G. Zestos**. "Novel Carbon-Based Microelectrodes for Neurotransmitter Detection." *University of Virginia Library Press: Dissertation.* **2014**, (1), 1-185.
25. **A. G. Zestos**, M. D. Nguyen, B. L. Poe, C. B. Jacobs, and B. J. Venton "Epoxy insulated carbon fiber and carbon nanotube fiber microelectrodes." *Sensors and Actuators B: Chemical.* **2013**, 182, 652-658.
26. G. Zhang, S. Xu, **A. G. Zestos**, R.E. Evans, J. Lu, and C.L. Fraser "An Easy Method to Monitor Lactide Polymerization with a Boron Fluorescent Probe" *ACS Appl. Mater. Interfaces* **2010**, 2, 3069-3074.
27. **A. G. Zestos**, C. L. Grinnell, L. J. Vinh, R. D. Pike, and W. H. Starnes, Jr "Metal-Exchanged Clay and Zeolite Additives as Smoke Suppressants and Fire Retardants for Poly(vinyl chloride)", *Journal of Vinyl and Additive Technology*, **2009**, 15, 87-91.
28. W.-K. Ho, J. K. Walker, S. V. Orski, T. W. Fuller, **A. G. Zestos**, C.L. Grinnell, R. D. Pike, and W. H. Starnes, Jr., "A New Synergistic Effect in the Smoke Suppression of Plasticized Poly(vinyl chloride) by Mixed-Metal Cu(II) Oxides" *Journal of Vinyl and Additive Technology*, **2008**, 14, 16.

29. X. Ge, E. K. Culyba, C. L. Grinnell, **A. G. Zestos**, and W. H. Starnes, Jr. “Mechanism of Action and Effectiveness of Ester Thiols as Thermal Stabilizers for Poly(vinyl chloride)” *Journal of Vinyl and Additive Technology*, 13, 170, **2007**; republished in *Polymers Research Journal*, 1, 277, **2008**; *Progress in Chemistry and Biochemistry*, 1, 91, **2009**.
30. W.-K. Ho, J. K. Walker, S. V. Orski, T. W. Fuller, **A. G. Zestos**, C. L. Grinnell, R. D. Pike, and W. H. Starnes, Jr., “Smoke Suppression by Mixed-Metal Cu(II) Oxides in Commercially Formulated Flexible PVC. A New Synergistic Effect” *Proceedings, Annual BCC Conference on Flame Retardancy of Polymeric Materials*, **2007**.

GRANTS

- American University Startup Funding
- NSF – ICORPS/AU - \$2,250 (**Funded**) (Fall 2018)
- NASA/Mathias STEM Summer Research Award – for student stipend I, \$5,000 (**Funded**) (Summer 2018)
- NASA/Mathias STEM Summer Research Award – for student stipend II, \$5,000 (**Funded**) (Summer 2018)
- American University Faculty Research Support Grant - \$10,000 (**Funded**) (May 2018 – May 2019).
- Inclusive Excellence Collaboration Mini-Grant - \$1,500 (**Funded**) (Spring 2019)
- ACS SEED Mentorship Grant - \$2,500 (**Funded**) (Summer 2018)

I have agreed to serve as a mentor for local students and received a grant for their stipends.

Prior to American University

- NIH-NIDA T32 training grant-Ruth L. Kirschstein Institutional National Research Service Award (NRSA) DA007268. September 2014-August 2017 (P.I.: John R. Traynor), -\$250,000 (**Funded**)
- NIDA Diversity Scholars Network (NDSN) Travel Grant (May – September 2017)
 - \$2,000 Travel Grant (**Funded**)
- Dopamine and SFB35 Conferences Travel Award (\$2,000) travel award. (**Funded**)
- FASEB 2016 Postdoctoral Preparation Institute (2016 PPI) Bethesda, Maryland, June 2016
 - \$1,500 Travel Grant (**Funded**)
- National Institutes of Health, National Institute on Drug Abuse, 4/2014-4/2017, \$416,167 1R21DA037584-01 “Carbon nanotube fiber and yarn microelectrodes for high temporal resolution measurements of dopamine” (P.I.: Professor B. Jill Venton) (**Funded**)
- Greeks Give Back Student Competition - \$1,000 (2012) (**Funded**)

This symposium was hosted by Greek-American leaders such as President Sylvia Burwell, Ted Leonsis, Congressman John Sarbanes, and others. Our proposal won first prize to fund the Campus Kitchen where we raised money to distribute food to underserved populations from dining halls to philanthropic organizations such as the Salvation Army.

 - Media coverage included an interview on local television and article on the Huffington Post
 - http://mmctv.granicus.com/MediaPlayer.php?view_id=2&clip_id=819
 - <https://www.youtube.com/watch?v=59vDMsqF82c>
- Oak Ridge National Laboratory Center for Nanoscale Materials User Facility (2012-2014)

“Carbon Nanomaterial Microelectrodes for Neurotransmitter Sensing” While there is no money associated with this proposal, we received 20 days of access to their nanoscale materials user facility and 5 days of access to their Shared Microscopy facilities. (P.I.: Professor B. Jill Venton) (**Funded**)
- Recipient of \$400 Howard Hughes Medical Institute (HHMI) Research Grant (Spring 2006) (**Funded**)

RESEARCH INTERESTS AND SKILLS/MENTORING

- Current Research Mentees at American University
 - Mulugeta Sarbanes (Postbac student)
 - Pauline Wonenberg (B.S./M.S. 2019)
 - Sanuja Mohanaraj (M.S. 2019)
 - Carly Truong (CAS 2020)
 - Alyssa Miller (CAS 2020)
 - Ashish Bhattarai (CAS 2018)
 - Alexander Mendoza (CAS 2019)

- Sayed Hussaini (M.S. 2019)
- Dilpreet Raju (CAS 2020)
- Nathan Dagadu (ACS High School Summer Student)
- M.S. Committee Member Anneliese Faustino (Spring 2018)
- M.S. Committee Member Sean Nugent (Spring 2018)
- M.S. Committee Chair: Sayed Hussaini (Spring 2019)
- M.S. Committee Chair: Sanuja Mohanaraj (Spring 2019)
- Independent Study Course: Anneliese Faustino (Spring 2018)
- Research Interests: Neuroscience, Drug Abuse, Electrochemistry, Voltammetry, *In vivo* testing, Nanotechnology/nanomaterials, Polymer Science, Pharmacology, Mass Spectrometry, LC-MS, Bioseparations, Microdialysis
- Mentored over 20 graduate/undergraduate students
- Completed Honors Thesis with M. Shamma (2015-2016).

MEMBERSHIPS AND AWARDS

- Csaba Horvath Young Investigator Award Finalist for HPLC Conference (July 2018)
- Certified Green Teacher, American University (Fall 2017)
- Electrochemical Society (ECS) Member May (May 2017 – Present)
- University of Michigan Postdoctoral Association (August 2014 – August 2017)
- “Epoxy Insulated Carbon Nanotube Fiber Microelectrodes,” 13th Annual Robert J. Huskey Research Exhibition, University of Virginia, March 2013. 3rd Place Award in Biological Sciences Division, Oral Presentation Session
- “Fabrication of epoxy-coated carbon-fiber microelectrodes.”
12th Annual Robert J. Huskey Research Exhibition, University of Virginia, March 2012
1st Place Winner in Physical Sciences Division
- User: Oak Ridge National Laboratory, Oak Ridge, TN (June 2012 – Present)
- Society for Neuroscience Member (2012 - Present)
- Annual Technical Conference of the Society of Plastics Engineers
Chicago, Illinois -Best Paper Award (6/09)
- Member of American Chemical Society (ACS) (2007-Present)
- Alpha Lambda Delta National Honors Society
- Phi Eta Sigma National Honors Society
- National Society of Collegiate Scholars (NSCS)
- National Valedictorian Honors Society
- James Monroe Scholar – The College of William and Mary (Top 5% of Incoming Freshman Class)

COURSES

- Biochemistry I: CHEM 465/CHEM 665 (Fall 2017)
- Biochemistry II: CHEM 466/CHEM 666 (Spring 2018)
- Experimental Biological Chemistry II: CHEM 472/672 (Spring 2018)
- Independent Study Analytics for Biologics: CHEM 690 (Spring 2018)
- Instrumental Analysis; CHEM 460 (Fall 2018)
- Experimental Biological Chemistry I: CHEM 471/671 (Fall 2018)
- Master’s Thesis Research: CHEM 797 (Fall 2018)
- I-CORPS Product Devel, Interdisciplinary Sciences: PSM-696-001 (Fall 2018)

CURRICULUM DEVELOPMENT

- Development of New W2 Courses in Chemistry (along with Profs. Fox, Hartings, and Zou)
 - CHEM 471/671 – Experimental Biological Chemistry I
 - CHEM 472/672 – Experimental Biological Chemistry II
- Bioanalytical Chemistry (CHEM455/655 – Topics in Inorganic and Analytical Chemistry)
 - Pending Approval for Spring 2019

SERVICE

- Chemistry Seminar Committee (Chair)
 - I have hosted over ten speakers to the department, which have spoken to hundreds of students and faculty throughout the university including Dr. Irene Glowinski and other prominent speakers
- Chemistry Instrument Committee
- STEM Working Group: Subgroup of Curriculum Committee
- W2 Subgroup Committee Meetings Attendee
- Chair Review Committee (Chemistry Department)
- Orthodox Christian Fellowship (Faculty Advisor)
- IACUC Protocol Review Committee (2/18 – Present)
- Journal Reviewer: Journal of Materials Chemistry B
- Journal Reviewer: Colloids and Surface B: Biointerfaces
- Journal Reviewer: Journal of the Electrochemical Society
- ISSNA (*Italian Scientists and Scholars in North America*) Young Investigator Award Reviewer
- Chemistry Representative for Spring and Summer Preview Day at AU (2018)
- ACS Chemical Society of Washington (CSW): Member and Running as a Manager

PRESENTATIONS

At American University

- “Novel Electrode Materials for Neurotransmitter Metabolite Detection”
Pittcon, Philadelphia, PA (March 2019)
- “Ruboxistaurin Attenuates Cocaine-Stimulated Increases in Dopamine and Locomotion”
Society for Neuroscience (SFN): San Diego, California (November 2018)
- “Carbon Nanomaterials for Enhanced Neurotransmitter Metabolite Detection.”
Eastern Analytical Symposium (EAS): Plainsboro, NJ, (November 2018)
- “Novel LC-MS/MS Microdialysis Assay for Neurochemical Sensing During Period of Drug Abuse”
HPLC Conference, Washington D.C. July 29, 2018
- CAS Mathias Conference Faculty Mentor for Presentations (March 2018)
Sanuja Mohanaraj, Pauline Wonnemberg, Sayed Hussaini, Maryam Yammadi
- “Protein Kinase C Inhibitors Attenuate Amphetamine-Stimulated Dopamine Overflow”
Society for Neuroscience (SFN), Washington D.C., November 15, 2017.
- “Characterization of Chemical Biomarkers in a Novel In Vivo Model of Ictogenesis.”
Society for Neuroscience (SFN) (with Hiram Luna-Munguia), Washington D.C., November 12, 2017.
- “Analytical Methods Development for the Complex Measurements of Neurochemicals.”
American University Center for Behavioral Neuroscience and Department of Chemistry Seminar,
Washington D.C., October 25, 2017.
- “Carbon Nanotube-Based Microelectrodes for Enhanced Neurochemical Detection.”
Electrochemical Society (ECS), Fall 2017 Meeting, National Harbor, MD, October 4, 2017.
- “LC-MS Method to detect neurotransmitters in vivo during period of drug abuse.”
254th American Chemical Society (ACS) National Meeting in Washington, DC, August 24, 2017.

Prior to Employment at American University

- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
American University, Washington, D.C., 12/16
- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
Vanderbilt University, Nashville, TN 12/16.
- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
Georgia Southern University, Statesboro, GA. 11/16.
- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
University of Dayton, Dayton, OH. 11/16.
- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
Creighton University, Omaha, NE. 11/16.

- “Analytical Methods Development for the Complex Measurements of Neurotransmitters in the Brain”
Western Washington University, Bellingham, WA, 10/16.
- "PKC β inhibitors attenuate amphetamine stimulated dopamine efflux."
SFB35 Transporter and Dopamine Conferences, Vienna Austria, 08/31-09/08/16.
- "Protein Kinase C Inhibitors as Amphetamine Abuse Therapeutics."
Karle Symposium, Ann Arbor, MI. 07/16
- "LCMS-Microdialysis Method for Neurotransmitter Quantification."
Novartis Symposium, Ann Arbor, MI 05/16.
- "PKC β inhibitors attenuate amphetamine stimulated dopamine efflux"
Pittcon, Atlanta, GA. 03/16.
- "PKC β inhibitors attenuate amphetamine and cocaine stimulated dopamine release"
Society for Neuroscience, Chicago, IL. 10/15.
- “Polyethyleneimine CNT-Fiber Microelectrodes For Neurotransmitter Detection.”
PITTCO. Chicago, IL. 03/14.
- “Polyethyleneimine Carbon Nanotube Fiber Microelectrodes.”
ACS National Meetings. Indianapolis, IN, 09/13.
- “Epoxy Insulated Carbon Fiber and Carbon Nanotube Fiber Microelectrodes,”
PITTCO, Philadelphia, PA, 3/13.
- “Alternative Epoxy Insulations for Carbon-Fiber Microelectrodes,”
Society for Neuroscience, New Orleans, LA, 10/12.
- “A Novel Epoxy Method of Construction for Carbon Fiber Microelectrodes,”
PITTCO, Orlando, FL, 3/12.
- “Construction of Epoxy Insulated Carbon Fiber Microelectrodes,”
Southeastern Regional Meeting of the American Chemical Society (SERMACS), Richmond, VA, 10/11.
- Annual Robert J. Huskey Research Exhibition,
University of Virginia, 4/10, 4/12, 4/13, 4/14.
- “Smoke Suppression of PVC by Metal-Exchanged Clay and Zeolite Additives,”
67th Annual Technical Conference of the Society of Plastics Engineers, Chicago, Illinois, 6/09, (Best Paper Award presentation).
- 2008 Graduate Research Symposium
“Effects of Metal-Based Montmorillonite Clay and Zeolite Additives on the Fire Retardance and Smoke Suppression of Poly(vinyl chloride),” The College of William and Mary, 2/08.
- “Recent Progress in the Smoke Suppression of Poly(vinyl chloride) by Copper-Containing Additives”, W. H. Starnes, Jr., J. K. Walker, W.-K. Ho, R. D. Pike, A. G. Zestos, C. L. Grinnell, S. V. Orski, T. W. Fuller, and L. J. Vinh, presented by WHS at the 14th International Conference on Plastics Additives and Compounding, Barcelona, Spain, October 16, 2008

MEDIA COVERAGE

- My research publications have received media coverage from:
 - C&EN News
 - MSN News
 - Yahoo News
 - *The Independent*
 - Xinhua
 - Eureka Alert
 - Newswise
 - Science Daily
 - Other outlets from around the world including: Greece, Germany, Portugal, Italy, China, Indonesia, and other nations

CONTRIBUTION TO PATENT **APPLICATION**

- Tested Ester Thiol Stabilizer for PVC (SK-6) -W/Prof. Starnes, College of William and Mary.