

ANDRES W. MARTINEZ

DEPARTMENT OF CHEMISTRY AND BIOCHEMISTRY
CALIFORNIA POLYTECHNIC STATE UNIVERSITY
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EDUCATION

- 2004-2009 **Harvard University**, Cambridge, MA
Degrees Awarded: Ph.D. Chemistry, M.S. Chemistry
- 2001-2003 **Stanford University**, Stanford, CA
Degree Awarded: B.S. Chemistry with distinction and departmental honors
- 1999-2001 **Diablo Valley College**, Pleasant Hill, CA

EXPERIENCE

- 2021-present **Professor**, Department of Chemistry and Biochemistry, California Polytechnic State University (Cal Poly), San Luis Obispo, CA
- 2016-2021 **Associate Professor**. Department of Chemistry and Biochemistry, Cal Poly
- 2016-2017 **Visiting Scientist**. Department of Biology, Technische Universität Darmstadt, Darmstadt, Germany
- 2010-2016 **Assistant Professor**. Department of Chemistry and Biochemistry, Cal Poly
- 2009-2010 **Volunteer**. Association of Private Health Facilities in Tanzania (APHFTA), Dar es Salaam, Tanzania
- 2006-2009 **Resident Tutor of Chemistry**. Dunster House, Harvard University
- 2004-2009 **Graduate Student** with George Whitesides. Harvard University, Cambridge, MA
- 2003-2004 **Research Assistant**. Stanford University School of Medicine, Stanford, CA

AWARDS/HONORS

As an independent investigator:

- Profiled in the April 2019 issue of ChemMatters magazine
- Society for Analytical Chemists of Pittsburg Undergraduate Research Award, 2016
- Research featured in C&EN Science Concentrates, Volume 93, Issue 20, 2015
- Distinguished speaker award, SelectBio Microfluidics and Lab on a Chip India, 2015
- 3M Non-tenured Faculty Award, 2012-2015

Student Awards:

- Conor Camplisson, 1st place in the undergraduate Physical and Mathematical Science Division at the 28th CSU Student Research Competition.
- Haydn Mitchell, 2nd place in the graduate Physical and Mathematical Science Division at the 28th CSU Student Research Competition.
- Kevin Schilling, 2nd place in the undergraduate Health, Nutrition, and Clinical Sciences Division at the 26th CSU Student Research Competition.

Prior to independent career:

- Popular Mechanics Breakthrough Award, 2009.
- Fieser Lecture Award, Harvard University, Department of Chemistry, 2008.
- National Science Foundation Graduate Research Fellowship, 2005 – 2008.
- Harvard Certificate of Distinction in Teaching, 2005.
- S.S. Marsden Award in Chemistry for Excellence in Research, Stanford University, 2003.

- Gates Millennium Scholarship, 2000 – 2003.
- American Chemical Society Scholarship, 2002.
- Phi Theta Kappa All-California Academic First Team member, 2001.

SELECTED OUTREACH AND SERVICE

- Academic editor for PeerJ Analytical Chemistry, 2019-present
- Co-developed a saliva collection device for Cal Poly's COVID surveillance program, 2021
- Keynote speaker for the American Chemical Society's 2020 Project SEED Virtual Summer Camp
- Coordinated Cal Poly's Chemistry and Biochemistry summer research program, 2013-2020
- External Ph.D. committee member for Joseph Pazzi, U.C. Merced, 2017-2021
- NIH early career proposal reviewer, EBIT study section, 2019
- Keynote speaker for Cal Poly Mexa's Xicanx 2019 Youth Conference
- Contributed to a special exhibit on diagnostics displayed in the London Science Museum, 2015
- Developed 7 new experiments for General Chemistry (CHEM 126), Quantitative Analysis (CHEM 331) and Instrumental Analysis (CHEM 439)
- Reviewed 118 manuscripts for 25 journals
- Reviewed 13 grant proposals for organizations including NIH, Breakout Labs, The Netherlands Organization for Scientific Research, Genome BC's Proof-of-Concept program, and the European Commission of Research and Innovation Horizon 2020-PHC10

TEACHING EXPERIENCE

At Cal Poly:

CHEM 127-129—General Chemistry I-III: 1st year general chemistry sequence
CHEM 331—Quantitative Analysis: 2nd year analytical chemistry course
CHEM 439—Instrumental Analysis: 4th year analytical chemistry course
CHEM 101—Introduction to the Chemical Sciences: 1st year seminar
CHEM 201—Undergraduate Research
CHEM 400—Special Problems for Advanced Undergraduates
CHEM 401—Advanced Undergraduate Research
CHEM 461—Senior Project Report
CHEM 500—Special Problems for Graduate Students

Prior to Cal Poly:

TF for CHEM 17—Principles of Organic Chemistry, Harvard University.
TF for CHEM 20—Organic Chemistry, Harvard University.
TA for CHEM 36—Organic Chemistry Laboratory I, Stanford University.

PUBLICATIONS

As an independent investigator: (undergraduate students are underlined, Master's students are double underlined, * denotes corresponding author)

43. Vazquez-Alvarado, M.; Vanasupa, S.; Herrera Valdez, E.; Crowder, M. J.; Vanasupa, L.; Martinez, N. W.; **Martinez, A. W.*** "Evaluation of Chromogenic Substrates for Horseradish Peroxidase on Paper-Based Microfluidic Devices," *Sensors and Actuators B: Chemical*, submitted 7/15/2022.
42. Ruiz, R. A.; Gonzalez, J. L.; Vazquez-Alvarado, M.; Martinez, N. W.; **Martinez, A. W.*** "Beyond Wax Printing: Fabrication of Paper-Based Microfluidic Devices Using a Thermal Transfer Printer," *Analytical Chemistry*, 2022, 94, 25, 8833-8837.
41. Jangid, A. R.; Strong, E. B.; Chuang, J.; **Martinez, A. W.**; Martinez, N.W.* "Evaluation of commercially-available conductive filaments for 3D printing flexible circuits on paper," *PeerJ Materials Science*, 2022, 4:e21.

40. Schmuck, V.D.E.; Romine, I. C.; Sisley, T. A.; Immoos, C. E.; Scott, G. E.; Zigler, D. F; **Martinez, A. W.*** "At-Home Microscale Paper-Based Quantitative Analysis Activity with External Standards," *Journal of Chemical Education*, 2022, 99, 2, 1081-1086.
 39. Nishat, S.; Jafry, A. T.; Awan, F. R.; **Martinez, A. W.*** "Paper-based microfluidics: simplified fabrication and assay methods," *Sensors and Actuators B: Chemical*, 2021, 336, 129681.
 38. Strong, E. B.; Lore, B. A.; Christensen, E. R.; Martinez, N. W.; **Martinez, A. W.*** "How to Shrink Paper Money: A Macroscopic Demonstration of the Malaprade Reaction," *Journal of Chemical Education*, 2019, 96, 1199-1204.
 37. Siquenza, N.; Jangid, A. R.; Strong, E. B.; Merriam, J.; **Martinez, A. W.**; Martinez, N. W.* "Micro-staining microbes: An alternative to traditional staining of microbiological specimens using microliter volumes of reagents," *Journal of Microbiological Methods*, 2019, 164, 105654.
 36. Jangid, A. R.; Strong, E. B.; Escamilla, E.; Lore, B. A.; Tod, N. J.; Thiel, R.; **Martinez, A. W.**; Martinez, N. W.* "Chronometric Quantitation of Analytes in Paper-Based Microfluidic Devices (MicroPADs) via Enzymatic Degradation of a Metastable Biomatrix" *Inventions*, 2019, 4, 48.
 35. Strong, E. B.; Knutson, C.; Wells, J. T.; Jangid, A. R.; Mitchell, M. L.; Martinez, N. W.; **Martinez, A. W.*** "Wax-Printed Fluidic Time Delays for Automating Multi-Step Assays in Paper-Based Microfluidic Devices," *Inventions*, 2019, 4, 20.
 34. Strong, E. B.; Schultz, S. A.; **Martinez, A. W.**; Martinez, N. W.* "Fabrication of Miniaturized Paper-Based Microfluidic Devices," *Scientific Reports*, 2019, 9:7.
 33. Strong, E. B.; Kirschbaum, C. W.; **Martinez, A. W.**; Martinez, N. W.* "Paper miniaturization via periodate oxidation of cellulose," *Cellulose*, 2018, 25, 3211-3217.
 32. **Martinez, A. W.***; Martinez N. W.; Christensen, E. R. "Paper-based methods," *Encyclopedia of Analytical Science*, 3rd edition; Elsevier; Oxford, 2018.
 31. Liu, C. H.; Noxon, I.C.; Cuellar, L. E.; Thraen, A. L.; Immoos, C. E.; **Martinez, A. W.***; Costanzo, P. J.* "Characterization of Reagent Pencils for Deposition of Reagents onto Paper-based Microfluidic Devices," *Micromachines*, 2017, 8, 242.
 30. Ganaja, K. A.; Chaplan, C. A.; Zhang, J.; Martinez, N. W.; **Martinez, A. W.*** "Paper Microzone Plates as Analytical Tools for Studying Enzyme Stability: A Case Study on the Stabilization of Horseradish Peroxidase Using Trehalose and SU-8 Epoxy Novolac Resin," *Analytical Chemistry*, 2017, 89, 5333-5341.
 29. Schultz, S. A.; Noxon, I.C.; Sisley, T. A.; **Martinez, A. W.*** "Paper-based Diagnostic Devices," in *Portable Biosensors and Point-of-Care Systems*; Kintzios, S. E., Ed; The Institution of Engineering and Technology; London, 2017; pp 27-41.
 28. **Martinez, A. W.** "Good on Paper," *The Translational Scientist*, 2017, July 17-09.
 27. Camplisson, C. K.; Schilling, K. C.; Pedrotti, W. L.; Stone, H. A.; **Martinez, A. W.*** "Two-ply Channels for Faster Wicking in Paper-Based Microfluidic Devices," *Lab on a Chip*, 2015, 15, 4461-4466.
 26. Mitchell, H. T.; Schultz, S. A.; Costanzo, P. J.; **Martinez, A. W.*** "Poly(*N*-isopropylacrylamide) Hydrogels for Storage and Delivery of Reagents to Paper-Based Analytical Devices" *Chromatography*, 2015, 2, 436-451.
 25. Mitchell, H. T.; Chaplan, C. A.; Noxon, I. C.; Carlton, S. J.; Liu, C.; Ganaja, K. A.; Martinez, N. W.; Immoos, C. E.; Costanzo, P. J.; **Martinez, A. W.*** "Reagent Pencils: A New Technique for Solvent-Free Deposition of Reagents onto Paper-Based Microfluidic Devices," *Lab on a Chip*, 2015, 15, 2213-2220.
 24. Chaplan, C. A.; Mitchell, H. T.; **Martinez, A. W.*** "Paper Based Standard Addition Assays," *Analytical Methods*, 2014, 6, 1296-1300.
 23. Schilling, K. M.; Jauregui, D.; **Martinez, A. W.*** "Paper and Toner Three-Dimensional Fluidic Device: Programming Fluid Flow to Improve Point-of-Care Diagnostics," *Lab on a Chip*, 2013, 13, 628-631.
 22. Schilling, K. M.; Lepore, A. L.; Kurian, J. A.; **Martinez, A. W.*** "Fully Enclosed Microfluidic Paper-Based Analytical Devices," *Analytical Chemistry*, 2012, 84, 1579-1585.
 21. **Martinez, A. W.*** "Microfluidic Paper-based Analytical Devices: from POCKET to Paper-based ELISA," *Bioanalysis*, 2011,3, 2589-2592.
- Prior to independent career:**
20. Ravgiala, R. R.; Weisburd, S.; Sleeper, R.; **Martinez, A. W.**; Rozkiewicz, D.; Whitesides, G. M.; Hollar, K. A. *Journal of Chemical Education*, 2014, 91, 107-111.

19. Vella, S. J.; Beattie, P.; Cademartiri, R.; Laromaine, A.; **Martinez, A. W.**; Phillips, S. T.; Mirica, K. A.; Whitesides, G. M. *Analytical Chemistry*, 2012, 84, 2883-2891.
18. **Martinez, A. W.**; Phillips, S. T.; Carrilho, E.; Whitesides, G. M. *Middle East Laboratory*, 2010, 13, 15-22.
17. Cheng, C. M.; Mazzeo, A. D.; Gong, J.; **Martinez, A. W.**; Phillips, S. T.; Jain, N.; Whitesides, G. M. *Lab on a Chip*, 2010, 10, 3201-3205.
16. Cheng, C. M.; **Martinez, A. W.**; Gong, J.; Mace, C. R.; Phillips, S. T.; Carrilho, E.; Mirica, K. A.; Whitesides, G. M. *Angewandte Chemie International Edition*, 2010, 49, 4771-4774.
15. **Martinez, A. W.**; Phillips, S. T.; Nie, Z.; Cheng, C. M.; Carrilho, E.; Wiley, B. J.; Whitesides, G. M. *Lab on a Chip*, 2010, 10, 2399-2504.
14. Nie, Z.; Nijhuis, C.; Gong, J.; Chen, X.; **Martinez, A. W.**; Narovlyansky, M.; Kumachev, A.; Whitesides, G. M. *Lab on a Chip*, 2010, 10, 477-483.
13. **Martinez, A. W.**; Phillips, S. T.; Carrilho, E.; Whitesides, G. M. *Analytical Chemistry*, 2010, 82, 3-10.
12. **Martinez, A. W.**; Kan, J. L. *Africa Health, Tanzania*, 2009, November, 7-8.
11. **Martinez, A. W.**; Kan, J. L. *Africa Health, Tanzania*, 2009, November, 6-7.
10. Ellerbee, A. K.; Phillips, S. T.; Siegel, A. C.; Mirica, K. A.; **Martinez, A. W.**; Striehl, P.; Jain, N.; Prentiss, M.; Whitesides, G. M. *Analytical Chemistry*, 2009, 81, 8447-8452.
9. Carrilho, E.; **Martinez, A. W.**; Whitesides, G. M. *Analytical Chemistry*, 2009, 81, 7091-7095.
8. Carrilho, E.; Phillips, S. T.; Vella, S.; **Martinez, A. W.**; Whitesides, G. M. *Analytical Chemistry*, 2009, 81, 5990-5998.
7. **Martinez, A. W.**; Phillips, S. T.; Whitesides, G. M. *Proceedings of the National Academy of Sciences*, 2008, 105, 19606-19611.
6. **Martinez, A. W.**; Phillips, S. T.; Wiley, B. J.; Gupta, M.; Whitesides, G. M. *Lab on a Chip*, 2008, 8, 2146-2150.
5. **Martinez, A. W.**; Phillips, S. T.; Carrilho, E.; Thomas, S.; Sindi, H.; Whitesides, G. M. *Analytical Chemistry*, 2008, 80, 3699-3707.
4. **Martinez, A. W.**; Phillips, S. T.; Butte, M. J.; Whitesides, G. M. *Angewandte Chemie International Edition*, 2007, 46, 1318-1320.
3. Siegel, A. C.; Shevkoplyas, S. S.; Weibel, D. B.; Bruzewicz, D. A.; **Martinez, A. W.**; Whitesides, G. M. *Angewandte Chemie International Edition*, 2006, 45, 6877-6882.
2. **Martinez, A. W.**; Recht, N. S.; Hostetter, T.H.; Meyer, T.W. *Journal of the American Society of Nephrology*, 2005, 16, 3430-3436.
1. Meyer, T. W.; Walther, J. L.; Pagtalunan, M. E.; **Martinez, A. W.**; Torkamani, A.; Fong, P. D.; Recht, N. S.; Robertson, C. R.; Hostetter, C. H. *Kidney International*, 2005, 68, 867-877.

PRESENTATIONS

- SelectBio Point-of-Care Diagnostics Congress, invited speaker, Coronado, CA, December 2021
- SelectBio Point-of-Care Diagnostics Congress, invited speaker, virtual, December 2020
- SelectBio Point-of-Care Diagnostics Congress, invited speaker, Coronado, CA December 2019
- Medical MEMS and Sensors 2018, invited speaker, Santa Clara, CA, November, 2018.
- 256th ACS National Meeting & Exposition, invited speaker, Boston, MA, August 2018.
- UC Merced, invited speaker, Merced, CA, April 2018
- Pittcon 2018, invited speaker, Orlando, FL, February 2018
- SelectBio Point-of-Care Diagnostics, invited speaker, Munich, Germany, May 2017
- Pittcon 2017, invited speaker, Chicago, IL, March 2017
- Pittcon 2016, invited speaker, Atlanta, GA, March 2016
- 9th IEEE International Conference, invited speaker, Waikiki, HI, December 2015
- Microfluidics and Lab on a Chip India, invited speaker, Mumbai, India, January 2015
- 2nd IBN International Symposium, invited speaker, Singapore, December 2014
- 7th World Congress of Biotechnology, invited speaker, Boston, MA, July 2014
- California State University, Los Angeles, invited speaker, Los Angeles, CA, October 2013
- 3M corporation, invited poster presentation, St. Paul, Mn, June 2013
- Point-of-Care Diagnostics Workshop, invited speaker, Nairobi, Kenya, June 2012

- Molecular Diagnostics Summit, invited speaker, Hannover, Germany, October 2011
- Capillary-based Microfluidics Workshop, invited speaker, Seattle, WA, October 2011

PATENTS

As an independent investigator:

1. "Membrane-based Devices for Multi-step Assays," US Patent No. 10279344B2, July 5, 2019
2. "Assay Devices and Methods," US Patent No. 10837960B2, November 17, 2020
3. "Biomaterial Having Decreased Surface Area, Degradable Scaffolds of Same, and Methods of Making," US20190300831A1, filed March 28, 2019.
4. "Reagent-loaded Pencils and Methods," US Patent No. 10343168B2, July 9, 2019
5. "Metered Liquid Sample Collection Device," WO2022146624A1, filed December 7, 2020

Prior to independent career:

6. "Fabrication of Conductive Pathways, Microcircuits and Microstructures in Microfluidic Networks," US Patent No. 8486833B2, July 16, 2013
7. "Paper-Based Microfluidic Systems," US Patent No. 8921118B2, December 30, 2014
8. "Three-dimensional Microfluidic Devices," US Patent No. 8628729B2, January 14, 2014
9. "Lateral Flow and Flow-Through Bioassay Devices Based on Patterned Porous Media, Methods of Making the Same, and Methods of Using the same," US Patent No. 9664679B2, May 30, 2017
10. "Microfluidic, Electrochemical Devices," US Patent No. 9192933B2, November, 24, 2015
11. "Methods of Micropatterning Paper-based Microfluidics" Publication number US 2012/0198684 A1. Filed 3/8/10.
12. "Density-based Methods for Separation of Materials, Monitoring of Solid Supported Reactions and Measuring Densities of Small Liquid Volumes and Solids," US Patent No. 9551706B2, January 24, 2017

RESEARCH SUPPORT

2021-2022	W. M. Keck Foundation Undergraduate Education Programs (DT061716), "Integrating Paper Microfluidics Research into the Undergraduate Curriculum," subaward from Cal State LA	\$50,000
2017-2023	NSF-RUI DMR, Biomaterials, "Miniaturized Paper as a Low-Cost, Patternable, Shapable and Degradable Scaffold for Cell Culture and Tissue Engineering," Award #1709740, Co-PI	\$390,000
2016-2022	NSF-RUI CBET, Fluid Dynamics, "Evaporation-driven Capillary Flow in Paper-Based Microfluidic Devices," Award #1605499	\$181,438
2016-2018	Society for Analytical Chemists of Pittsburg, Undergraduate Research Grant	\$10,000
2012-2015	3M Non-Tenured Faculty Grant	\$45,000
2014-2015	Center for Applications in Biotechnology Grant (Cal Poly)	\$18,506
2014-2105	Research, Scholarly and Creative Activity Award (Cal Poly)	\$10,000
2012-2013	Extramural Funding Initiative Award (Cal Poly)	\$5,295
2011-2012	CSUPERB New Investigator Grant	\$13,535

LANGUAGES

- English: native language
- Spanish: native language
- German: intermediate (speaking, reading, writing)
- Mandarin Chinese: beginner (speaking, reading, writing)