

JANUARY 31, 2022

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EXPERIENCE AND EDUCATION

AMERICAN UNIVERSITY Associate Professor, Department of Chemistry	2018-PRESENT
AMERICAN UNIVERSITY Assistant Professor, Department of Chemistry	2010-2018
NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY GUEST RESEARCHER	2017-PRESENT
CALIFORNIA INSTITUTE OF TECHNOLOGY NIH Ruth Kirchstein NRSA Postdoctoral Fellow; Advisor: Harry B. Gray	2005-2010
NORTHWESTERN UNIVERSITY Ph.D. in Chemistry; Advisors: Mark A. Ratner and Thomas J. Meade	2000-2005
SANDIA NATIONAL LABORATORY Research Intern (May thru December); Advisor: Scott E. Bisson	1998
UNIVERSITY OF DAYTON B.S. in Chemistry and Physics (<i>Magna Cum Laude</i>)	1996-2000

AWARDS AND FUNDING

Funding

2019 Parker Hannifin Research Grant
2018 NIST Measurement Science and Engineering Research Grant
2015 NASA DC Space Consortium Grant
2011 NASA DC Space Consortium Grant
2006 NIH Ruth Kirchstein NRSA Postdoctoral Fellowship

External Awards

2018 ACS MARM E. Emmet Reid Award in Chemistry Teaching

University Awards

2016 College Dean's Innovation Award
2013 CTRL Teaching with Research Award

Writing Awards

Top Article for the "Maillard reaction" by *Chemical and Engineering News*
"I love gin and tonics" selected for an anthology titled *The Best Science Writing Online 2012*

Research Awards

"Altmetrics Award" from *Science and Technology of Advanced Materials* 2016

BOOK

Matthew Hartings "Chemistry in your Kitchen" Royal Society of Chemistry, 2016.

PUBLICATIONS

*Denotes American University undergraduate student; ^Denotes American University master's student; ☉Denotes primary investigator.

American University

Submitted

- Casey, C. P.^; **HARTINGS, MATTHEW R.**; Knapp, Melissa A.; Malloy, Elizabeth J.; Knee, Karen L.☉ Oil gas regional water quality.

Published

- Jayabalan, M.*; Caballero, M. E.^; Cordero, A. D.*; White, B. M.*; Asalone, K. C.^; Moore, M. M.*; Irabor, E. G.; Watkins, S. E.; Walters-Conte, K. B.; Taraboletti, A.; Hartings, Matthew R.; Choy, B. Y.; Saeed, B. A.; Bracht, K.A.; Bracht, John R.☉ Unrealized potential from smaller institutions: Four strategies for advancing STEM diversity. *Cell* **2021**, *184*(24), 5845-5850.
- Liu, FA*; Ardabili, N^; Brown, I*; Rafi, H; Cook, C*; Nikopoulou, R*; Lopez, A*; Zou, S; **HARTINGS, MATTHEW R.**; Zestos, AG☉. Modified Sawhorse Waveform for the Voltammetric Detection of Oxytocin. *Journal of the Electrochemical Society*, *169*(1), 017512.
- Brown, K.^; Mendoza, M.*; Tinsley, T.^; Bee-DiGregorio, M. B.*; Bible, M.*; Brooks, J. L.*; Colorado, M.*; Esenther, J.*; Farag, A.*; Gill, R.^; Kalivas, E. N.*; Lara, R.*; Rasines Mazo, A.*; Rodriguez, R. S.*; Schwabacher, J. C.*; Zestos, Alexander M.; Fox, Douglas M.☉; **HARTINGS, MATTHEW R.☉** Polyvinyl alcohol-montmorillonite composites for water purification: Analysis of clay mineral cation exchange and composite particle synthesis. *Polyhedron* **2021**, *205*, 115297. doi: 10.1016/j.poly.2021.115297
- **HARTINGS, MATTHEW R.☉**; Castro, N.J.; Gill, K.*; Ahmed, Z. A Photonic pH Sensor Based on Photothermal Spectroscopy *Sensors and Actuators B: Chemical* **2019**, *301*, 127076. doi: 10.106/j.snb.2019.127076 *chemRxiv* doi: 10.26434/chemrxiv.8798993.v1.
 - COVERED BY: *Genetic Engineering & Biology News* 'Novel Light-Based Sensor Developed to Study Tissue Growth in the Lab' December 13, 2019
 - COVERED BY: *Optics.org* 'Photonic pH sensor could advance studies of tissue regeneration' December 16, 2019
 - COVERED BY: *SciTechDaily* 'New Photonic pH Sensor Tracks Lab-Grown Tissue – Helps Advance Toward Growing Limbs and Organs' December 14, 2019
- Mohanaraj, S.; Wonnenberg, P.; Cohen, B.; Zhao, H.; **HARTINGS, MATTHEW R.**; Zou, S.; Fox, D. M.; Zestos, A. G.; Gold Nanoparticle Modified Carbon Fiber Microelectrodes for Enhanced Neurochemical Detection *JOVE* **2019** doi: 10.3791/59552
- **HARTINGS, MATTHEW R.☉**; Ahmed, Z. Chemistry from 3D Printed Objects. *Nature Reviews Chemistry* **2019**, *3*, 305-314. Doi: 10.1038/s41570-019-0097-z
- Borchardt, R.☉; Moran, C.*; Cantrill, S.; Chemjobber; See Arr Oh; **HARTINGS, MATTHEW R.☉** Chemists' perception of research publication importance and its relation to citation rates. *PLoS One*

2018, 13(3), e0194903. doi: 10.1371/journal.pone.0194903 Data set doi: 10.6084/m9.figshare.5187529

- **HARTINGS, MATTHEW R.**; Douglass, K. O.; Neice, C.; Ahmed, Z. Humidity responsive photonic sensor based on a carboxymethyl cellulose mechanical actuator. *Sensors and Actuators B* 2018, 265, 335-338. doi: 10.1015/j.snb.2018.03.065
- Bible, M.[^]; Sefa, M.; Fedchak, J. A.; Scherschligt, J.; Ahmed, Z.; **HARTINGS, MATTHEW R.**[✉] 3D printed ABS-MOF composite materials and their gas storage properties. *3D Printing and Additive Manufacturing* 2018, 5(1), 63-72. doi: 10.1089/3dp.2017.0067
- Hart, C.^{*}; Abuladel, N.^{*}; Bee, M.^{*}; Channell, M.[^]; Cvitan, A. C.^{*}; Esson, M. M.^{*}; Farag, A.^{*}; Ibeh, T.^{*}; Kalivas, E.^{*}; Larco, D.^{*}; Long, A.^{*}; Lymperopoulos, L.^{*}; Mendel, Z.^{*}; Miles, N.^{*}; Montanero, C.^{*}; Schwabacher, J. C.^{*}; Slucher, H.^{*}; Vinals-Camallonga, J.^{*}; Heddleston, J.M.; Li, W.; Fox, D.M.; **HARTINGS, MATTHEW R.**[✉] On the mechanism of protein-templated gold nanoparticle synthesis: Protein organization, controlled gold sequestration, and unexpected reaction products. *Dalton Transactions* 2017, 46, 16465-16473. doi: 10.1039/C7DT03275G
- Dempsey, J. L.; **HARTINGS, MATTHEW R.**[✉] Hop to It. *Biochemistry*, 2017, 56(42), 5623-5624.
- Channell, M. N.[^]; Sefa, M.; Fedchak, J. A.; Scherschligt, J.; Bible, M.[^]; Natarajan, B.; Klimov, N. N.; Miller, A. E.; Ahmed, Z.; **HARTINGS, MATTHEW R.**[✉] Toward 3D printed hydrogen storage materials made with ABS-MOF composites. *Accepted: Polymers for Advanced Technologies*, 2017, doi: 10.1002/PAT.4197
 - Featured in *Stereo Chemistry* podcast 2018, March 5th. <https://cen.acs.org/articles/96/i10/Feast-ears-first-episode-new-podcast-stereo-chemistry.html>
 - Featured in article on *Materials Today* “Plastic MOF for printing inexpensive sensors and fuel cell batteries” 2017, November 15.
- Mody, P.[^]; Hart, C.^{*}; Romano, S.^{*}; El-Magbri, M.^{*}; Esson, M. M.^{*}; Ibeh, T.^{*}; Knowlton, L.; Zhang, M.; Wagner, M.J.; **HARTINGS, MATTHEW R.**[✉] Protein-based ferrogels. *Journal of Inorganic Biochemistry* 2016, 159, 7-13. doi:10.1016/j.jinorgbio.2016.02.015
- Skorski, M.^{*}; Esenther, J.^{*}; Miller, A. E.; Fox, D.M.; **HARTINGS, MATTHEW R.**[✉] The chemical, mechanical, and physical properties of 3-D printed materials composed of TiO₂-ABS nanocomposites. *Science and Technology of Advanced Materials* 2016, 17(1), 89-97. doi: 10.1080/14686996.2016.1152879
 - Featured in *Mechanical Engineering* for their “Hot Labs” feature 2016, July, p. 22-23.
 - Received “2016 Altmetrics Award” from *Science and Technology of Advanced Materials*
- Long, A.^{*}; Rothenberg, P.^{*}; Patel, D.^{*}; MacDougall, J.^{*}; **HARTINGS, MATTHEW R.**[✉] The structure and peroxidase activity of myoglobin in alcoholic solvents. *Polyhedron* 2016, doi:10.1016/j.poly.2015.11.028
- **HARTINGS, MATTHEW R.**[✉]; Fox, D.M.; Miller, A.E.; Muratore, K.M. A hybrid integrated laboratory and inquiry-based research experience: Replacing traditional laboratory instruction with a sustainable student-led research project. *Journal of Chemical Education* 2015, 92(6), 1016-1023.

○ Featured in *Science* as an Editors' Choice from recent literature 2015, 348(6232).

• **HARTINGS, MATTHEW R.**; Benjamin, N.*; Briere, F.*; Briscione, M.*; Choudary, O.*; Fisher, T. L.*; Flynn, L.*; Ghias, E.*; Harper, M.*; Khamis, N.*; Koenigsnecht, C.*; Lazor, K.*; Moss, S.*; Robbins, E.*; Schultz, S.*; Yaman, S.*; Haverhals, L. M.; Trulove, P. C.; De Long, H. C.; Miller, A. E.; Fox, D. M. Concurrent 0-D and 1-D biomineralization of gold from a solution of Au³⁺ and bovine serum albumin *Science and Technology of Advanced Materials* 2013, 14(6), 065004.

• **HARTINGS, MATTHEW R.** Reactions coupled to palladium *Nature Chemistry* 2012, 4(9), 764

• **HARTINGS, MATTHEW R.**; Fahy, D. Communicating Chemistry for Public Engagement *Nature Chemistry* 2011, 3, 674-677.

California Institute of Technology, Northwestern University, and University of Dayton

• **HARTINGS, MATTHEW R.**; Kurnikov, Igor V.; Dunn, Adam R.; Winkler, Jay R.; Gray, Harry B.; Ratner, Mark A. Electron tunneling through sensitizer wires bound to proteins *Coordination Chemistry Reviews* 2010, 245(3-4), 248-253.

• Barker, Kylie D.; Eckermann, Amanda L.; Sazinsky, Matthew H.; **HARTINGS, MATTHEW R.**; Abajian, Carnie; Georganopoulou, Dmitra; Ratner, Mark A.; Rosenzweig, Amy C.; Meade, Thomas J. Protein binding and the electronic properties of iron(II) complexes: an electrochemical and optical investigation of outer sphere effects *Bioconjugate Chemistry* 2009, 20(10), 1930-1939.

• **HARTINGS, MATTHEW R.**, Gray, Harry B.; Winkler, Jay R. Probing melittin helix-coil equilibria in solutions and vesicles. *Journal of Physical Chemistry B*. 2008, 112, 3202-3207.

• Eckermann, Amanda L.; Barker, Kylie; **HARTINGS, MATTHEW R.**; Ratner, Mark A.; Meade, Thomas J. Synthesis and electrochemical characterization of a transition-metal-modified ligand-receptor pair. *Journal of the American Chemical Society* 2005, 127, 11880-11881.

• Damsbo; Martin; Kinnear, Brian S.; **HARTINGS, MATTHEW R.**, Ruhoff, Peder T.; Jarrold, Martin F.; Ratner, Mark A. Application of evolutionary algorithm methods to polypeptide folding: Comparison with experimental results for unsolvated Ac-(Ala-Gly-Gly)₅-Lys+H⁺. *Proceedings of the National Academy of Sciences* 2004, 101, 7215-7222.

• **HARTINGS, MATTHEW R.**; Kinnear, Brian S.; Jarrold, Martin F. The energy landscape of unsolvated peptides: the role of context in the stability of alanine/glycine helices. *Journal of the American Chemical Society* 2003, 125, 3941-3947.

• Kinnear, Brian S.; **HARTINGS, MATTHEW R.**; Jarrold, Martin F. The energy landscape of unsolvated peptides: helix formation and cold denaturation in Ac-Ala₄-Gly₇-Ala₄+H⁺. *Journal of the American Chemical Society* 2002, 124, 4422-4431.

• Kinnear, Brian S.; **HARTINGS, MATTHEW R.**; Jarrold, Martin F. Helix unfolding in unsolvated peptides. *Journal of the American Chemical Society* 2001, 123, 5660-5667.

• Bisson, Scott E.; Armstrong Karla M.; Kulp, Thomas J.; **HARTINGS, MATTHEW R.** Broadly tunable, mode-hop-tuned cw optical parametric oscillator based on periodically poled lithium niobate *Applied Optics* 2001, 40(33), 6094-6055.

• Oomens, Jos; Bisson, Scott E.; **HARTINGS, MATTHEW R.**; Kulp, Thomas J.; Harren, Frans J. M. New laser sources for photoacoustic trace gas detection with applications in biomedical science. *Proceedings SPIE (Biomedical Optoacoustics)* Ed. Oraevsky, AA 2000, 1(10), 295-300.

Non-academic

- “Chemistry in Your Kitchen” November 2016, Royal Society of Chemistry, London, UK
- “I love gin and tonics” in *The Best Science Writing Online 2012* Jennifer Ouellette and Bora Zivkovic (Eds.) Scientific American/Farrar, Strauss and Giroux (September 18, 2012)
- “Maillard Reaction” *Chemical and Engineering News*, November 21st, 2011

SELECTED MEDIA COVERAGE and APPEARANCES

- “Brining research into teaching labs” *Chemical and Engineering News* March 14, 2016 (Online at: <http://cen.acs.org/articles/94/i11/Bringing-research-teaching-labs.html>)
- “There’s a scientific reason why chocolate chip cookies and milk taste so good together” *Quartz* March 11, 2016 (Online at: <http://qz.com/635619/theres-a-scientific-reason-why-chocolate-chip-cookies-and-milk-taste-so-good-together/>)
- “Well-tempered Chocolate” *Chemistry World* December 1, 2015 (Online at: <http://www.rsc.org/chemistryworld/2015/11/chocolate-chemistry-cocoa-butter-crystal-structure-emulsion>)
- “What are you doing for Thanksgiving?” *Popular Science* November 26, 2015 (Online at: <http://www.popsci.com/what-are-you-doing-for-thanksgiving-matthew-hartings>)
- “This is your body on turkey” *Time* November 24, 2015 (Online at: <http://time.com/4124271/thanksgiving-day-2015-turkey/>)
- “Turning down the heat when cooking meat may reduce cancer risk” *NPR* November 23, 2015 (Online at: <http://www.npr.org/sections/thesalt/2015/11/23/456654768/turning-down-the-heat-when-cooking-meat-may-reduce-cancer-risk>)
- “Nitro Cold Brew” *Chemical and Engineering News*, August 24, 2015 (Online at: <http://cen.acs.org/articles/93/i33/Nitro-Cold-Brew.html>)
- “Solving the super weird chemical mystery of powdered alcohol drinks” *Forbes*, March 13, 2015 (Online at: <http://www.forbes.com/sites/fayeflam/2015/03/13/solving-the-super-weird-chemical-mystery-of-powdered-alcohol-drinks/>)
- “Here’s why stale bread is hard, but stale chips are soft” *Business Insider*, September 5, 2014 (Online at: <http://www.businessinsider.com/what-makes-bread-and-chips-stale-2014-9>)
- “The science behind why bacon smells so good” *The Today Show*, May 29, 2014 (Online at: <http://www.today.com/video/today/55285278#55285278>)
- “Powdered booze, Washing machine Lego complexes” *Chemical and Engineering News*, May 26, 2014 (Online at: <http://cen.acs.org/articles/92/i21/Powdered-Booze-Washing-Machine-Lego.html>)
- “No more formaldehyde baby shampoo” *Slate*, March 3, 2014 (Online at: http://www.slate.com/articles/health_and_science/medical_examiner/2014/03/is_formaldehyde_dangerous_no_but_johnson_johnson_removed_it_from_baby_shampoo.html)
- “The Alchemist to Open at AU’s Greenberg Theater” January 29, 2014 (Online at: <http://www.american.edu/cas/news/the-alchemist.cfm>)
- “What are you afraid of?” *Chemistry World*, October 29th, 2013 (Online at: <http://www.rsc.org/chemistryworld/2013/10/chemophobia>)
- “The judgement of your peers” *Chemistry World*, October 24th, 2013 (Online at: <http://www.rsc.org/chemistryworld/2013/10/research-quality-measuring-judgement-metrics>)

- “To Act or Not to Act” *Chemical and Engineering News*, April 22nd, 2013 (Online at: <http://cen.acs.org/articles/91/i16/Act-Act.html>)
- “An insider’s view of chemistry (and chemical communication)” *The Knight Science Journalism Tracker*, October 26th, 2012 (Online at: <http://ksj.mit.edu/tracker/2012/10/insiders-view-chemistry-and-chemical-com>)
- “A Chemist Comes Very Close to a Midas Touch” *New York Times*, October 15th, 2012 (Online at: http://www.nytimes.com/2012/10/16/science/modern-day-alchemy-has-iron-working-like-platinum.html?_r=0)
- “So About that 2012 Nobel Prize in Chemistry” *The Knight Science Journalism Tracker*, October 11th, 2012 (Online at: <http://ksj.mit.edu/tracker/2012/10/so-about-2012-nobel-prize-chemistry>)
- “Kitchen Chemistry Classes Take Off” *Chemical and Engineering News*, September 3rd, 2012 (Online at: <http://cen.acs.org/articles/90/i36/Kitchen-Chemistry-Classes-Take-Off.html>)

TEACHING EXPERIENCE

- | | |
|---|---|
| <ul style="list-style-type: none"> • The Chemistry of Cooking • General Chemistry I • General Chemistry II | <ul style="list-style-type: none"> • Experimental Biological Chemistry Laboratory • Advanced Chemistry Laboratory • Advanced Inorganic Chemistry |
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PRESENTATIONS

INVITED LECTURES:

- American Chemical Society National Conference (Fall 2015): Communicating Chemistry
- American Chemical Society National Conference (Spring 2015): Harry Gray Award Symposium
- American Chemical Society National Conference (August 2014): Communicating Chemistry
- The Ohio State University Spectroscopy Seminar (November 2014)
- North Carolina Inorganic Research Seminar (April 2014)
- American University Emeriti Professor and Alumni Luncheon (September 2012)

CONFERENCE PRESENTATIONS

- American Chemical Society National Conference Fall (lecture and poster) (August 2014)
- International Conference of Bioinorganic Chemistry (July 2013)
- American Chemical Society National Conference Spring (lecture and poster) (April 2013)
- American Chemical Society National Conference Fall (lecture and poster) (August 2012)
- International Conference of Bioinorganic Chemistry (August 2011)

PROFESSIONAL ASSOCIATIONS

- American Chemical Society
- Society of Biological Inorganic Chemistry

COMMUNITY OUTREACH and PROFESSIONAL SERVICE

- Advisory Board Member for ChemAttitudes, an NSF Funded project that aims to reinvent the way that chemistry is presented in science museums. (2016 – 2018)

- Selection as a Nifty Fifty speaker by the USA Science and Engineering Festival (2014 - 2017)
- Advisory Board member for Chemical and Engineering News (2014 - current)
- Member of the American Chemical Society's Experts Program (2013 - present)
- Board member for the American Chemical Society's online journalism outpost: CENtral Science (2012 - current)
- Chemistry blogger at sciencegeist.net (2010 - current)
- General lecture titled, "Nano 101" given to high school and senior citizen groups (2004-2005)

PUBLIC RESEARCH PROFILES

ORCID (<http://orcid.org/0000-0003-0658-939X>)

ResearchGate (http://www.researchgate.net/profile/Matthew_Hartings)

Google Scholar (<https://scholar.google.com/citations?user=LVL-LJgAAAAJ&hl=en>)