

## Publications by UCA Chemistry faculty and students

### 2013 \* Designates Student Authors

Desrochers, P. (2013). Beyond Ordinary Undergraduate Experiences: Routine Measurements with Heteronuclear, Heterogeneous, and Paramagnetic Samples. In Soulsby, D.; Anna, L. J.; Wallner, A. S. (Ed.), *NMR Spectroscopy in the Undergraduate Curriculum* (vol. 1128, pp. 169-186). Washington, DC, USA: ACS Symposium Series. [http://pubs.acs.org.ucark.uca.edu/doi/abs/10.1021/bk-2013-1128.ch011?prevSearch=desrochers&searchHistoryKey=Invited? Yes.](http://pubs.acs.org.ucark.uca.edu/doi/abs/10.1021/bk-2013-1128.ch011?prevSearch=desrochers&searchHistoryKey=Invited?Yes)

Grubb, M. P., Dooley, K. S., Freeman, D. C.\*, Peterson, K. J., North, S. W. (2013). Experimental and theoretical investigation of correlated fine structure branching ratios arising from state-selected predissociation of BrO ( $A2 \cdot 3/2$ ). *To appear in Royal Society of Chemistry*, 16(2), 607-615.  
<http://pubs.rsc.org/en/Content/ArticleLanding/2014/CP/c3cp53766h#ldivAbstract> Impact Factor: 3.829. Invited? Yes.

Dunlap, V. B., Cook, E. C., Rumi-Masante, J., Arvin, H. G., Lester, T. E., Creamer, T. P. (2013). The distal helix in the regulatory domain of calcineurin is important for domain stability and enzyme function. *Biochemistry/American Chemical Society*, 52, 8643-8651.  
[pubs.acs.org/doi/pdf/10.1021/bi400483a](http://pubs.acs.org/doi/pdf/10.1021/bi400483a) Impact Factor: 3.377. Invited? No.

Stewart, M.\*, Dunlap, T.\*, Dourlain, E.\*, Grant, B.\*, Isom, L. A. (2013). Cations form sequence selective motifs within DNA grooves via a combination of cation-pi and ion-dipole/hydrogen bond interactions. *PLoS ONE*, 8(8), 1-13. [www.ncbi.nlm.nih.gov/pmc/articles/PMC3735504/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3735504/) Impact Factor: 4.10. Invited? No.

Grant, B.\*, Dourlain, E.\*, Araneda, J.\*, Throneberry, M.\*, Isom, L. A. (2013). DNA phosphate crowding correlates with protein cationic side chain density and helical curvature in protein-DNA crystal structures. *Nucleic Acids Research*, 41(15), 7547-7555.  
[www.ncbi.nlm.nih.gov/pmc/articles/PMC3753625/](http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3753625/) Impact Factor: 8.28. Invited? No.

Marquis, B. J. (2013). Active transcriptomic and proteomic reprogramming in the *C. elegans* nucleotide excision repair mutant xpa-1. *To appear in Nucleic Acids Research*. Impact Factor: 8.026.

Marquis, B. J. (2013). Toxicity of Nanoparticles to Brine Shrimp: An Introduction to Nanotoxicity and Interdisciplinary Science. *Journal of Chemical Education*. Impact Factor: 0.677.

Hunt, P. R., Marquis, B. J., Katherine, T. M., Sean, C., Nicholas, O., Bryant, N. C., Robert, S. L. Nanosilver suppresses growth and induces oxidative damage to DNA in *Caenorhabditis elegans*. *Journal of Applied Toxicology*, 33(10), 1131-1142.

Bryant, N. C., Elijah, P. J., Marquis, B. J., Donald, A. H., John, E. T., Danielle, C., Stephanie, W. S., I-Hsiang, T., Andrew, D., Melisa, T., Joany, J. (2013). NIST gold nanoparticle reference materials do not induce oxidative DNA damage. *Nanotoxicology*, 7(1), 21-29.

Perry, D. A. (2013). Surface-enhanced Infrared Absorption on Elongated Nickel Nanostructures. *Journal of Physical Chemistry Letters*, 4, 3945-3949. Impact Factor: 6. Invited? No.

Perry, D. A. (2013). Surface-enhanced Infrared Absorption and Density Functional Theory Study of Dihydroxybenzene Isomer Adsorption on Silver Nanostructures. *Journal of Physical Chemistry C*, 117, 8170-8179. Impact Factor: 6. Invited? No.

Perry, D. A. Applications of Surface-Enhanced Raman Scattering in Advanced Bio-Medical Technologies and Diagnostics. *Nanomedicine: Nanotechnology, Biology and Medicine*. Status: Submitted.

Perry, D. A., Razer, T. M.\*, Primm, K. M.\*, Chen, T.\*, Shamburger, J. B.\*, Golden, J. W.\*, Owen, A. R.\*, Price, A. S.\*, Borchers, R. L.\*, Parker, W. R.\* Surface-enhanced Infrared Absorption and Density Functional Theory Study of Dihydroxybenzene Isomer Adsorption on Silver Nanostructures. *Journal of Physical Chemistry C*. Status: Revising to Resubmit.

Bates, L. N.\*, Castaneda, A. M., Boyd, C. E., Steelman, K. L. (2014). A Black Deer at Black Cave: New Pictograph Radiocarbon Date for the Lower Pecos, TX. *To appear in Bulletin of the Texas Archeological Society*, in press. Invited? No.

Koenig, C. W., Castaneda, A. M., Boyd, C. E., Rowe, M. W., Steelman, K. L. (2014). Portable X-Ray Fluorescence Spectroscopy of Pictographs: A Case Study from the Lower Pecos Canyonlands, Texas. *Archaeometry*, published in on-line early view. Invited? No.

McDonald, J., Steelman, K. L., Veth, P. M., Mackey, J.\*, Loewen, J.\*, Thurber, C.\* (2014). Report on the first intensive dating program for pigment art from the Australian arid zone: insights into recent social complexity. *To appear in Journal of Archaeological Science*, in press. Invited? No.

Rowe, M. W., Phomakay, J.\*, Lay, J. O., Guevara, O., Srinivas, K., Hollis, W. K., Steelman, K. L., Guilderson, T. P., Stafford Jr, T. W., Chapman, S. L., King, J. W. (2013). Application of supercritical carbon dioxide-co-solvent mixtures for removal of organic material from archaeological artifacts for radiocarbon dating. *Journal of Supercritical Fluids*, 79, 314-323. Invited? No.

Stelman, K. L., Burger, H.\* (2013). Plasma oxidation of organic residues on modern stone tools. In RA Armitage & JH Burton (Ed.), *Archaeological Chemistry VIII* (vol. 1147, pp. 145-156). Washington DC: Archaeological Chemistry VIII, American Chemical Society Symposium Series. Invited? Yes.

Duncan, J. R., Diaz-Granados, C., Steelman, K. L., Rowe, M. W., Guilderson, T. P. (2014). The Black Warrior Pictograph. In C Diaz-Gradados & J Duncan (Ed.), *Missouri Rock Art Tradition* (vol. Chapter 9, pp. in press). St. Louis, MO: Washington University Press. Invited? Yes.

Taylor, W. S., Fancher, K. G.\*, Chen, L. C.\*, Ward, B. K.\*, Cameron, C. A.\* (2013). Probing Ni+ Metastable State Production in Sputtering Glow Discharges with the Use of Diagnostic Reactions. *International Journal of Mass Spectrometry*, 352, 29-36. Impact Factor: 2.030. Invited? No.

“A History of Chemistry at the University of Central Arkansas,” J.Manion and R. Mauldin, in progress.

“A Novel Approach to Teaching Scientific Reasoning to Future Journalists: An Intellectual Framework for Evaluating Press Reports About Scientific Research,” R.F. Mauldin, *Science Communication*, 34(2), 283-291 (2012).

“A Check on the Expansion of the Major: Potential Positive Impact of a Limit on Total Hours for New Degree Programs,” R.F. Mauldin, list-serve posting for the Association for General and Liberal Studies (2012).

### **2011 Total: 10**

“Characterization of Aminophenol Isomer Adsorption on Silver Nanostructures” **Perry, D.A.**; Cordova, J.S.; Smith, L.G.; Son, H.J.; Biris, A.S. *Vibrational Spectroscopy*, 2011, 55, 77-84.

“C-H...O Hydrogen Bonding in a 4-fluorobenzoate Multilayer Induced by Silver Nanoparticles” **Perry, D.A.**; Schiefer, E.M.; Cordova, J.S.; Bonde, A.M.; Razer, T.M.; Primm, K.A.; Chen, T.; Biris, A.S. *Chem. Phys. Let.* 2011, 511, 348-350.

“Immobilized Boron-Centered Heteroscorpionates: Heterocycle Metathesis and Coordination Chemistry” **Desrochers, P. J.**; Besel, B. M.; Corken, A. L.; Evanov, J. R.; Hamilton, A. L.; Nutt, D. L.; **Tarkka, R. M.** *Inorganic Chemistry*, 2011, 50, 1931 – 1941.

“Definition and Formulation of Scientific Prediction and its Role in Inquiry-Based Labs,” *Journal of Chemical Education*, **R.F. Mauldin**, Vol. 88, No. 4, April 2011, pp. 449-451.

### **2010 Total: 10**

S. Wei, G. Xu, L. C. Bridges, P. Williams, J. M. White, D. W. DeSimone, “ADAM 13 Induces Cranial Neural Crest by Cleaving Class B Ephrins and Regulating Wnt Signaling”. *Developmental Cell*. 2010;19(2):345-352.

S. Wei, C. A. Whittaker, G. Xu, L. C. Bridges, A. Shah, J. M. White, D. W. DeSimone, “Conservation and Divergence of ADAM Family Proteins in the Xenopus Genome”. *BMC Evolutionary Biology*. 2010; 10:211. Impact 4.3

Patrick J. Desrochers, **Brian M. Besel, Adam L. Corken, Jared R. Evanov, Andrea L. Hamilton, David L. Nutt**, Richard M. Tarkka "Immobilized Boron-Centered Heteroscorpionates: Heterocycle Metathesis and Coordination Chemistry" *Inorganic Chemistry* ASAP December 28, 2010. DOI: 10.1021/ic102392x

R. Mauldin "Definition and Formulation of Scientific Prediction and its Role in Reaching Conclusions in Inquiry-Based Labs," accepted for publication by the *Journal of Chemical Education*, October of 2010. R. Mauldin, M. Gress "The Six Regional Accrediting Bodies: An AGLS Study of Best Practices in General Education," R. Mauldin and M. Gress, position paper for the Association for General and Liberal Studies' website, **accepted** for on-line publication by the Executive Council of AGLS at the October, 2010 annual meeting in Austin, Texas.

D.A. Perry, **H.J. Son, J.S. Cordova, L.G. Smith**, A.S. Biris, *J. Coli. Inter. Sci.* 342, 311-319 (2010).

**J. Cordova, E. Schiefer, A Bonde, T. Razer, T. Chen**, O. Perry *Chern. Phys. Let.* 497, 5256 (2010).

O.A. Perry, **J.S. Cordova**, W.O. Spencer, L.G. Smith, A.S. Biris, *J. Phys. Chern C* 114, 14953-14961 (2010).

O.A. Perry, **J.S. Cordova**, L.G. Smith, H.J. Son, A.S. Biris, *Vib. Spec.* 55, 77-84 (2011).

Fox JT, Adams **G, Sharum M**, & Steelman KL. 2010 Passive Sampling of Bioavailable Organic Chemicals in Perry County, Missouri Cave Streams. *Environmental Science & Technology* 44: 8835-8841.

Patrick J. Desrochers, **Brian M. Besel, Adam L. Corken, Jared R. Evanov, Andrea L. Hamilton, David L. Nutt**, and Richard M. Tarkka. "Immobilized Boron-Centered Heteroscorpionates: Heterocycle Metathesis and Coordination Chemistry." *Inorganic Chemistry*, Articles ASAP web publication date: December 28, 2010. DOI: 10.10211ic102392x Impact Factor: 4.657 (2009 statics).

## **2009 Total: 7**

P. J. Desrochers, A. L. Corken, R. M. Tarkka, B. M. Besel, E. E. Mangum, T. N. Linz "A Simple Route to Single-Scorpionate Nickel(II) Complexes with Minimum Steric Requirements," *Inorganic Chemistry*, **48**, 3535-3541 (2009).

C. Nichols, K. Steelman, K. Felling, "SWRMing like Bees at the 2008 ACS Southwest Regional Meeting" *InChemistry*. 24-25, (April/May 2009).

D.A. Perry, H.J. Son, J.S. Cordova, L.G. Smith, A.S. Biris "Adsorption Analysis of Nitrophenol Isomers on Silver Nanostructures by Surface Enhanced Spectroscopy" *Journal of Colloid and Interface Science* **342**, 311-319 (2010). –accepted and published online in 2009.

D.A. Perry, J.S. Cordova, L.G. Smith, H.J. Son, E.M. Schiefer, E. Dervishi, F. Watanabe, A.S. Biris "Study of Adsorption of Aminobenzoic Acid Isomers on Silver Nanostructures by Surface-Enhanced Infrared Spectroscopy" *Journal of Physical Chemistry C* **113**, 18304-18311 (2009).

D.A. Perry, J.A. Boucher, K Posey, J.S. Cordova, L. Smith, H.J. Son, R. Pandey, A.S. Biris "Surface-enhanced Spectroscopic Investigation of the Adsorption Properties of Hydroxybenzoic Acid Isomers onto Metallic Surfaces" *Spectrochimica Acta Part A: Molecular and Biomolecular Spectroscopy* **74**, 104-112 (2009).

M. Smith, K. Stambaugh, L. Smith, H. Son, A. Garner, S. Cordova, K. Posey, D. Perry, A.S. Biris "Surface-enhanced Vibrational Investigation of Adsorbed Analgesics" *Vibrational Spectroscopy* **49**, 288-297 (2009).

N. A. Marley, J. S. Gaffney, M. Tackett, N. C. Sturchio, L. Hearaty, N. Martinez, K. D. Hardy, A. Marchany-Rivera, T. Guilderson, A. C. MacMillan, K. L. Steelman, "The impact of biogenic carbon sources on aerosol absorption in Mexico City," *Atmospheric Chemistry and Physics* **9**,1537-1549 (2009).

### **2008 Total: 3**

**Lance C. Bridges**, Joshua D. Lingo\*, Rachel A. Grandon\*, and Melissa D. Kelley.  
All-*trans*-Retinoic Acid Induces Integrin-independent B-cell Adhesion to ADAM Disintegrin Domains. *Biochemistry* 47(15):4544-4551

"Catalytic Dioxygen Activation by (Nitro)(meso-tetrakis(2-N-methylpyridyl)porphyrinato)-cobalt(III) Cation Derivatives Electrostatically Immobilized in Nafion Films: An Experimental and DFT Investigation" Goodwin, J. A.; Coor, J. L.; Kavanagh, D. F.; Sabbagh, M.; Howard, J. W.; Adamec, J. R.; Parmley, D. J.; Tarsis, E. M.; Kurtikyan, T. S.; Hovhannisyan, A. A.; Desrochers, P. J.; Standard, J. M. *Inorganic Chemistry*, **2008**, *47*, 7852-7862. "**Surface-enhanced Vibrational Investigation of Adsorbed Analgesics**" Smith, M.; Stambaugh, K.; Smith, L.; Son, H.; Garner A.; Cordova, S.; Posey, K.; Perry, D.; Biris, A. DOI: 10.1016/j.vibspec.2008.11.002

### **2007 Total: 9**

C. D. Sherrill, A. Dutta, M. L. Abrams, and J. S. Sears, "Bond Breaking in Quantum Chemistry: A Comparison of Single- and Multi-reference Methods," in *Electron Correlation Methodology*, vol. 958 of ACS Symposium Series, edited by A. K. Wilson and K. A. Peterson, **2007**, 75-88.

M. C. Tam, M. L. Abrams, and T. D. Crawford, "Chiroptical Properties of (R)-3-Chloro-1-butene and (R)-2-Chlorobutane," *J. Phys. Chem. A* **2007**, *111*, 11232-11241.

T. D. Crawford, M. C. Tam, and M. L. Abrams, "The Problematic Case of (S)-Methylthiirane: Electronic Circular Dichroism Spectra and Optical Rotatory Dispersion," *Mol. Phys.* **2007**, *105*, 2607-2617.

T. D. Crawford, M. C. Tam, and M. L. Abrams, "The Current State of Ab Initio Calculations of Optical Rotation and Electronic Circular Dichroism Spectra," *J. Phys. Chem. A* **2007**, *111*, 12057-12068.

Hong, I. S.; Carter, K. N.; Sato, K.; Greenberg, M. M., "Characterization and Mechanism of Formation of Tandem Lesions in DNA by a Nucleobase Peroxyl Radical," *J. Am. Chem. Soc.* **2007**, *129*, 4089-4098.

Desrochers, P. J.; Duong, D.; Marshall, A. S.; Lelievre, S. A.; Hong, B.; Brown, J. R.; Tarkka, R. M. Manion; J. M.; Holman, G.; Merkert, J. W.; Vicic, D. A., "Nickel-Cysteine Binding Supported by Phosphine Chelates" *Inorganic Chemistry* **2007**, *46*, 9221-9233.

Felling, Kyle W., "40 Years Since the Commercialization of Nafion: The Development of Fluorinated Ionomers," *Chimica Oggi/Chemistry Today*. **2007**, *25*, 19-22.

Desrochers, P. J.; Duong, D.; Marshall, A. S.; Lelievre, S. A.; Hong, B.; Brown, J. R.; Tarkka, R. M. Manion; J. M.; Holman, G.; Merkert, J. W.; Vicic, D. A., "Nickel-Cysteine Binding Supported by Phosphine Chelates" *Inorganic Chemistry* **2007**, *46*, 9221-9233.

Krystal L. Posey, Mark G. Viegas, A. Jacob Boucher, Chen Wang, Kaitlyn R. Stambaugh, Merritt M. Smith, Brittany G. Carpenter, Bridget L. Bridges, Steven E. Baker and Donald A. Perry, "Surface-Enhanced Vibrational and TPD Study of Nitroaniline Isomers," *Journal of Physical Chemistry C*, **2007**, *111*, 12352-12360

Steelman K. L., DuPriest J., Ruiz J. F., Mas M., Hernanz A., Gavira J. M., Rowe M. W., "First Radiocarbon Dating of Oxalate Crusts Over Spanish Prehistoric Rock Art," *International Newsletter of Rock Art*, **2007** *46*, 1-5.

### **2006 Total: 4**

"The Lowest  $^2A'$  Excited State of the Hydroxyl-Water Complex," Crawford, T.D.; Abrams, M.L.; King, R.A.; Lane, J.R.; Schofield, D.P.; Kjaergaard, H.G. *J. Chem. Phys.*, **2006**, *125*, 204302.

"Electronic Structure of Four-coordinate,  $C_{3v}$  Nickel(II) 'Scorpionate' Complexes: Investigation by High-Frequency and -Field Electron Paramagnetic Resonance and Electronic Absorption Spectroscopies" Desrochers, P. J.; Telser, J.; Zvyagin, S. A.; Ozarowski, A.; Krzystek, J.; Vicic, D. A. *Inorganic Chemistry* **2006**, *45*, 8930-8941.

"Ligand Redox Effects in the Synthesis, Electronic Structure, and Reactivity of an Alkyl-Alkyl Cross-Coupling Catalyst" Jones, G. D.; McFarland, C.; Allen, O. R.; Martin, J. L.; Hall, R. E.; Haley, A. D.; Brandon, R. J.; Kanovalova, T.; Desrochers, P. J.; Pulay, P.; Vicic, D. A. *Journal of the American Chemical Society* **2006**, *128*, 13175-13183.

"Lower Pecos and Coahuila Peyote: New Radiocarbon Dates," Terry, M.; Steelman, K.L.; Guilderson, T.; Derring, P.; Rowe, M.W. *Journal of Archaeological Science* **2006**, *33*, 1017-1021.

## **2005 Total: 6**

Desrochers, P. J.; Brown, J. R.; Arvin, M. E.; Jones, G. D.; Vicic, D. "Bis[hydrotris(4-chloro-3,5-dimethylpyrazolyl)borato]nickel(II)" *A. Acta Cryst.* **2005**, *E61*, m1455–m1458.

Steelman, K. L. and M. W. Rowe. **2005** "Dating Pictographs: Independent Dates and Their Implications for Rock Art." In *Making Marks: Graduate Studies in Rock Art Research at the New Millennium*. American Rock Art Research Association Occasional Paper No. 5. Edited by J.K.K. Huang & E.V. Culley, pp. 15-26. Tucson, AZ: ARARA Publications.

Steelman, K. L. and F.C. Famirex, R.F. Valcarce, T. Guilderson, M.W. Rowe. Direct Radiocarbon Dating of Megalithic Paints from North-west Iberia. **2005** *Antiquity* 79: 379-389.

Scott, S. A., C. M. Davis, **K. L. Steelman**, M. W. Rowe, and T. Guilderson.; Direct AMS Dates from Four Late Prehistoric Period Rock Art Sites in West-Central Montana. *Plains Anthropologist* **2005**, 50:57-71.

Taylor, W. S.; Matthews, C. C.; Parkhill, K. S. "Reactions of  $\text{Cu}^+(^1\text{S}, ^3\text{D})$  with  $\text{CH}_3\text{Cl}$ ,  $\text{CH}_2\text{ClF}$ ,  $\text{CHClF}_2$ , and  $\text{CClF}_3$ " *J. Phys. Chem. A* **2005**; 109; 356-365.

R. E. Gawley, M. Shanmugasundaram, J. B. Thorne, and Richard M. Tarkka. "Selective Detection of Saxitoxin over Tetrodotoxin Using Acridinylmethyl Crown Ether Chemosensor." *Toxicon* **2005**, 45, 783-787.