

## Grant Activity by UCA Chemistry Faculty

### 2012-2013

- Research Grant, **Carter, K. N.** (Principal Investigator) *Characterization of Valine Radicals*. URC Grant. \$3,440.00. November 22, 2013 - January 6, 2016.
- Other, **Carter, K. N.** (Principal Investigator). Generation and Characterization of a Phenylalanine Radical. \$2,755.00. January 15, 2010 - May 15, 2013.
- Research Grant, **Carter, K. N.** (Other). MRI: Acquisition of UPLC-TQMS and MALDI-TOFMS, National Science Foundation. \$577,986.00. July 29, 2009 - July 31, 2013.
- Research Grant, **Tarkka, R. M.** (Co-Principal Investigator), **Desrochers, P.** (Co-Principal Investigator). RUI: Polymer-Supported Scorpionates: Fast, Functional, Recyclable Metal Complexes, National Science Foundation CHE. \$274,420.00.
- Research Grant, **Kelley, M. D.** (Principal Investigator) *National Institutes of Health*. Understanding Immune Cell Signaling:Effect of Retinoids on ADAM Shedding, NIH. \$545,681.00. May 1, 2010 - April 30, 2015.
- Research Grant, **Marquis, B. J.** *Single worm metabolomics: a new platform for age related biomarker discovery*. Faculty Research Award. \$3,000.00. June 1, 2013 - August 15, 2013.
- Research Grant, **Marquis, B. J.** *Single worm metabolomics: A new platform for biomarker discovery*. Cottrell College Science Award, Reserach Corporation for Science Advancement. \$45,000.00.
- Research Grant, **Marquis, B. J.** *Using single worm metabolomics to detangle individual variability in aging*. Undergraduate Analytical Research Program Grant, Society for Analytical Chemists of Pittsburgh. \$10,000.00.
- Research Grant, **Perry, D. A.** NSF RUI: Investigation of Organic and Biological Multilayers Adsorbed on Elongated Metal Nanostructures, National Science Foundation. \$151,706.00.
- Research Grant, Mehta, R. (Principal Investigator), Mimms, J. W. (Co-Principal Investigator), **Perry, D. A.** (Co-Principal Investigator), **Steelman, K. L.** (Senior Investigator), Waggoner, B. M. (Co-Principal Investigator), Frederickson, C. K. (Senior Investigator) *MRI: Acquisition of a Scanning Electron Microscope for STEM Research and Training*. NSF-MRI, National Science Foundation (Major Research Instrumentation). \$254,115.00.

Contract, **Steelman, K. L.** (Principal Investigator). Radiocarbon Dating a Pictograph at Ft. Bliss, TX, Geo-Marine, Inc via US Army. \$1,500.00. 2012 - Present.

Research Grant, **Steelman, K. L.** (Principal Investigator) *Radiocarbon Dating Objects from Oak Island*. Private Funding, Oak Island Tours, Inc. \$2,250.00. 2013 - 2014.

Research Grant, **Steelman, K. L.** (Principal Investigator), Russ, J. (Other) *Radiocarbon Dating an Olmec Mural*. Rhodes College Collaboration Grant, Rhodes College Foundation. \$2,100.00. 2013 - 2014.

Research Grant, **Steelman, K. L.** (Principal Investigator) *Radiocarbon Dating Pictographs at Cova Eiros, Spain*. Sub-award, Universidade de Santiago Compostela. \$5,250.00. 2013 - 2014.

Research Grant, **Steelman, K. L.** (Principal Investigator) *Supercritical Fluid Extraction: A Non-Destructive Pre-Treatment Method for Plasma Oxidation*. Archaeometry Program, National Science Foundation. \$193,598.00. 2010 - 2013.

Contract, **Steelman, K. L.** (Principal Investigator) *The recognition, interpretation and management of significant rock art and related dreaming (Jukurrpa) sites on the Canning Stock Route, Western Australia*. Linkage Grant - subcontract, Australian Research Council. \$927,776.00. 2008 - 2013.

Research Grant, Mehta, R. (Principal Investigator), Mimms, J. W. (Co-Principal Investigator), **Perry, D. A.** (Co-Principal Investigator), **Steelman, K. L.** (Senior Investigator), Waggoner, B. M. (Co-Principal Investigator), Frederickson, C. K. (Senior Investigator) *MRI: Acquisition of a Scanning Electron Microscope for STEM Research and Training*. NSF-MRI, National Science Foundation (Major Research Instrumentation). \$254,115.00.

Research Grant, **Tarkka, R. M.** (Co-Principal Investigator), **Desrochers, P.** (Co-Principal Investigator). RUI: Polymer-Supported Scorpionates: Fast, Functional, Recyclable Metal Complexes, National Science Foundation CHE. \$274,420.00.

Other, **Yang, L.** (Principal Investigator) *Activation of Alkanes by Multicopper clusters/Polymers with Pyridyl Amide Ligands*. UCA University Research Concile. \$7,900.00. February 1, 2014 - August 31, 2015.

Research Grant, **Yang, L.** (Co-Principal Investigator) *Development and Characterization of Biofunctional Polymers and Nanomaterials*. Competitive Equipment Awards, Arkansas INBRE. \$25,000.00.

Research Grant, **Yang, L.** (Co-Principal Investigator) *Acquisition of A “Floating” X-ray Single-Crystal Diffractometer for Department of Chemistry (In Joint with University of Memphis, Arkansas State University, Harding University and Union University).* Major Research Instrumentation Program, National Science Foundation. \$220,200.00.

Research Grant, **Yang, L.** (Principal Investigator) *Activation on Nitrous Oxide (N<sub>2</sub>O) by Binuclear Transition Metal Complexes Supported by Bis(•-diketiminate) Ligands.* Petroleum Research Fund, American Chemical Society. \$50,000.00. July 1, 2013 - August 31, 2015.

Research Grant, **Yang, L.** (Principal Investigator) *Activation on Nitrous Oxide (N<sub>2</sub>O) by Binuclear Transition Metal Complexes Supported by Bis(•-diketiminate) Ligands.* Petroleum Research Fund, American Chemical Society. \$50,000.00. July 1, 2013 - August 31, 2015.

Research Grant, Frederickson, C. K. (Principal Investigator), Martin, J. C. (Co-Principal Investigator), Bland, M. W. (Co-Principal Investigator), Bunn, G. O. (Co-Principal Investigator), **Yarberry, F. M.** (Co-Principal Investigator), Mason, A. J. (Senior Investigator) *UCA Noyce Scholarship Program: Recruiting Highly Qualified Math and Science Teacher Candidates.* DUE - Noyce Teacher Scholarships, NSF. \$1,198,506.00.

Research Grant, Mason, A. J. (Co-Principal Investigator), Frederickson, C. K. (Principal Investigator), Bland, M. W. (Co-Principal Investigator), Bunn, G. O. (Co-Principal Investigator), Martin, J. (Co-Principal Investigator), **Yarberry, F. M.** (Co-Principal Investigator). Noyce Teacher Scholarship Grant, National Science Foundation. \$1,198,756.00.

Research Grant, Frederickson, C. K. (Principal Investigator), Martin, J. C. (Co-Principal Investigator), Bland, M. W. (Co-Principal Investigator), Bunn, G. O. (Co-Principal Investigator), **Yarberry, F. M.** (Co-Principal Investigator), Mason, A. J. (Senior Investigator) *UCA Noyce Scholarship Program Phase I.* UCA Noyce Scholarship Program Phase I, NSF. \$1,198,756.00.

## **Grants** obtained by UCA Chemistry Faculty

**2011 \$574,471**

Don Perry, matching grant 223003, \$3,965

Lance Bridges, matching grant 240087, \$20,856

Rick Tarrka and Patrick Desrochers, research, \$59,072

Cameron Dorey, purchase of TOF & LC-MS mass spectrometers, \$471,664

Melissa Kelly, Effect of Retinoid Metabolism, \$17,663

Don Perry, Nanotechnology Center, \$10, 868

Lance Bridges and Melissa Kelley, \$17, 595

nine additional smaller grants

## **2010 \$1,179,683**

"Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding," Research Corporation, \$56,650, Co-PIs Bridges and Kelley. June 1, 2009 – June 30, 2011

"Effect of Retinoid Metabolism on ADAM-Integrin Interactions in Human Blood Cell Lines," NIH INBRE, \$17,960, PI Kelley. May 1, 2009 – November 30, 2009

"RUI: Development of Organic and Biological Films on Vapor-deposited Metal Nanostructures," The National Science Foundation, \$131,611, Donald Perry, July 1, 2010 - June 30, 2013.

"Supercritical Fluid Extraction: A Non-Destructive Pre-treatment Method for Plasma Oxidation & AMS Radiocarbon Dating," National Science Foundation, Archaeometry, Karen Steelman, Kyle Felling, and Jerry King (UA-Fayetteville), \$269,658. July 1, 2010-June 30 2013.

"Generation and Characterization of a Phenylalanine Radical," (PI), University Research Council, Carter

"Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic NIH (INBRE) Grant: "Understanding Immune Cell Signaling: Effect of Retinoids on ADAM Shedding" (PI-M), July 1, 2010- June 30, 2015: \$545,681. Kelley

PI: \$193,598 Supercritical Fluid Extraction: A Non-Destructive Pre-Treatment Method for Plasma Oxidation & AMS Radiocarbon Dating; National Science Foundation, Archaeometry Program, Steelman

Co-PI: \$121,112; 2009-2010; Assessing effects of natural gas drilling in the Fayetteville Shale region; AR State Wildlife Grant., Steelman

PI: NSF-RUI; \$173,413: Exploring Mechanistic Parameters Regulating Bond-Activation in the State-Specific Reactions of Gas Phase Transition Metal Ions with Halogenated Molecules, Taylor

## **Continuing grant support**

National Science Foundation, Math and Physical Science, co-PI with Cameron Dorey (PI) and Nolan Carter, Donald Perry, Karen Steelman, Melissa Kelley (co-PIs). (\$672,958, 3 years), "MRI: Acquisition of UPLC-TQMS and MALDI-TOFMS"

Karen Steelman (PI) \$4,000; 2009-2010; *Radiocarbon Dating Rock Paintings in the Guadalupe Mountains, NM*; USDA, Lincoln National Forest.

Karen Steelman Co-PI: \$121,112; 2009-2010; *Assessing effects of natural gas drilling in the*

*Fayetteville Shale region*; AR State Wildlife Grant

Karen Steelman Co-PI: AUS\$927,776 (US\$30,000 to UCA); 2007-2010; *The recognition, interpretation and management of significant rock art and related dreaming (Jukurrpa) sites on the Canning Stock Route, Western Australia*; Australia Research Council Linkage Grant.

Bill Taylor: *Exploring the Role of Electron-Transfer in Halide Abstraction Reactions by Gas-Phase Metal Ions* Agency: URC

Bridges, L.C. (Co-PI with Dr. Melissa Kelley), ID: 7680 Research Corporation, Cottrell College Science Award "Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" 07/01/2008-07/31/2010, total direct costs from Research Corporation \$33,250 UCA SPO match \$19,250

Co-PI: \$60,000; *Lower Pecos Rock Art Recoding and Preservation Project*, The Shumla School Foundation; January 2009 – January 2012.

"Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic Supports," NSF, \$252,041 Co-PIs Desrochers and Tarkka. August 15, 2007 – July 31, 2010

## **2009 \$968,052**

Lance Bridges Co-PI, Arkansas INBRE (NIH), "Enhancing Cell Imaging Capabilities in the CNSM at UCA", \$50,000, "Acquisition of an Analytical Flow Cytometer for Natural Sciences and Teaching", \$82,452

National Science Foundation, Math and Physical Science, co-PI with Cameron Dorey (PI) and Nolan Carter, Donald Perry, Karen Steelman, Melissa Kelley (co-PIs). (\$672,958, 3 years), "MRI: Acquisition of UPLC-TQMS and MALDI-TOFMS"

Karen Steelman (PI) \$4,000; 2009-2010; *Radiocarbon Dating Rock Paintings in the Guadalupe Mountains, NM*; USDA, Lincoln National Forest.

Karen Steelman Co-PI: \$121,112; 2009-2010; *Assessing effects of natural gas drilling in the Fayetteville Shale region*; AR State Wildlife Grant.

Karen Steelman Co-PI: AUS\$927,776 (US\$30,000 to UCA); 2007-2010; *The recognition, interpretation and management of significant rock art and related dreaming (Jukurrpa) sites on the Canning Stock Route, Western Australia*; Australia Research Council Linkage Grant. *Exploring the Role of Electron-Transfer in Halide Abstraction Reactions by Gas-Phase Metal Ions* Agency: URC

Bill Taylor, \$7,530

## **Continuing grant support**

Bridges, L.C. (Co-PI with Dr. Melissa Kelley), ID: 7680 Research Corporation, Cottrell College Science Award "Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" 07/01/2008-07/31/2010, total direct costs from Research Corporation \$33,250 UCA SPO match \$19,250

Co-PI: \$50,000; *Contaminant Concentration Analysis in Streams in Perry County Karst, Perry County*; Missouri Soil and Water Conservation District; January 2008 – January 2010.

"Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic Supports," NSF, \$252,041 Co-PIs Desrochers and Tarkka. August 15, 2007 – July 31, 2010

"Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" UCA, University Research Council 02/08-02/10, total direct costs \$6,500

## **2008 \$218,921**

Bridges, L.C. (PI), P20 RR16460 Mentor: Ware, J. UAMS, Dept. of Physiology and Biophysics NIH, Arkansas IDeA Networks of Biomedical Research Excellence (INBRE), summer outreach "A Novel Regulatory Mechanism of a Human Lymphocyte Metalloprotease" 05/15/2008-8/15/2008, total direct costs \$15,821

Bridges, L.C. (Co-PI with Dr. Melissa Kelley), ID: 7680 Research Corporation, Cottrell College Science Award "Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" 07/01/2008-07/31/2010, total direct costs from Research Corporation \$33,250 UCA SPO match \$19,250

Bridges, L.C. (Co-PI with Drs. Melissa Kelley, J.D. Swanson, Kari Naylor, and Brent Hill) NIH, Arkansas IDeA Networks of Biomedical Research Excellence (INBRE), equipment grant "Expansion of Commonly Used Incubation and Freezer Equipment in the College of Natural Sciences and Mathematics at the University of Central Arkansas" 2008, total direct costs from AR INBRE \$25,000 with a UCA SPO match of \$5,000

SURF application for Zachary Byars submitted in which I was co-faculty advisor with Dr. Steve Runge, \$3900

ACS Undergraduate Programming Regional Meetings Grant, with Karen Steelman, (\$2,800, 1 year), "Rock Solid Chemistry, Undergraduate Research Symposium"

SURF grant: "Nanotechnological Investigation of Amino Acid Adsorption and Film Growth" \$3,900.

Co-PI: \$50,000; *Contaminant Concentration Analysis in Streams in Perry County Karst, Perry County*, Missouri Soil and Water Conservation District; January 2008 – January 2010.

Co-PI: \$60,000; *Lower Pecos Rock Art Recoding and Preservation Project*, The Shumla School Foundation; January 2009 – January 2012.

## **Continuing grant support**

"Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic Supports," NSF, \$252,041 Co-PIs Desrochers and Tarkka. August 15, 2007 – July 31, 2010

"Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" UCA, University Research Council 02/08-02/10, total direct costs \$6,500

Karen Steelman: *Contaminant Concentration Analysis in Streams in Perry County Karst, Perry County*, Missouri Soil and Water Conservation District; co-PI with Ginny Adams, \$50,000

## 2007 \$380,230

UCA Undergraduate Research Council Grant for \$10,300  
Bridges, L.C. (PI), P20 RR16460

"A Novel Regulatory Mechanism of a Human Lymphocyte Metalloprotease" Mentor: Ware, J.  
University of Arkansas for Medical Sciences Arkansas IDeA Networks of Biomedical Research  
Excellence (INBRE), summer outreach, 05/15/07-12/15/07, total direct costs \$15,289 Bridges,  
L.C. (Co-PI with Melissa Kelley)

"Effect of Retinoids on Lymphocyte Metalloprotease Mediated Shedding" UCA, University  
Research Council 02/08-02/10, total direct costs \$6,500

ACS Undergraduate Programming Regional Meetings Grant, with Karen Steelman, (\$2,800, 1  
year), "Rock Solid Chemistry, Undergraduate Research Symposium,"

ACS National Meeting Travel Awards, with Karen Steelman (\$300, 1 year), Travel to New  
Orleans National ACS meeting

Don Perry, Nanocenter Grant: "Surface-enhanced Vibrational Analysis of Nanofilms" \$33,000

Karen Steelman: Collaboration with Dr. Jo McDonald to radiocarbon date Australian rock  
paintings & study mineral accretions associated with paintings. She was a participating scientist  
on the overall grant from AIATSIS, which totaled AUS\$120,000. UCA's portion is \$10,000

Karen Steelman: *Contaminant Concentration Analysis in Streams in Perry County Karst*, Perry  
County, Missouri Soil and Water Conservation District; co-PI with Ginny Adams, \$50,000

"Reactivity, Spectroscopic, and Sensing Properties of Nickel Complexes on Solid Organic  
Supports," NSF, \$252,041 Co-PIs Desrochers and Tarkka. August 15, 2007 – July 31, 2010

## **2006 \$70,629**

"A Novel Regulatory Mechanism for a Human Lymphocyte Metalloprotease", UCA URC, \$8,712.

"Development of New Classes of Optical Materials Based on Dendrimer/Polymer Composites," UCA, URC Summer Stipend, \$2,700.

"Development of New Classes of Optical Materials Based on Dendrimer/Polymer Composites," UCA, URC Research Grant, \$6,480.

"Development of New Classes of Optical Materials Based on Dendrimer/Polymer Composites," Army-ARDEC, with David Dixon (SDSM&T) and Jacek Swiatkiewicz (SDSM&T), \$28,765.

"Study of Lubricants on the Ball-Bearings of Spacecraft" Arkansas Space Grant Consortium: Workforce Development Grant, \$6,500.

"Identification of Organic Material in Rocks Associated with Supposed Mammoth Rubs", California State Parks, \$5,000.

"Radiocarbon Dating of Australian Rock Paintings", (with Dr. Jo McDonald), \$9977.

"Plasma Oxidation & AMS Radiocarbon Measurement of Ancient Rock Paintings", Helena National Forest, \$2,495.

**2005 \$285,352**

“Using a Photolabile Precursor to Study Radical-Mediated Protein Damage” (PI) submitted to the American Chemical Society Petroleum Research Fund, \$35,000.

“Incorporating Gas-Chromatography/Mass Spectrometry (GC/MS) into a Teaching and Faculty-Mentored Undergraduate Research Curriculum,” (Co-PI) submitted to the National Science Foundation

Army-ARDEC, with David Dixon (SDSM&T) and Jacek Swiatkiewicz (SDSM&T), (\$99,900, 1 year), “Development of New Classes of Optical Materials Based on Dendrimer/Polymer Composites,” (This proposal was written and funded with me as PI and the collaborators as co-PIs. In order to keep the funding, the PI had to remain on the SDSM&T campus. So, the “official” PI of this project is now David Dixon. I do remain the project director of the sub-award made to the University of Central Arkansas.)

UCA, URC Summer Stipend, “Development of New Classes of Optical Materials Based on Dendrimer/Polymer Composites,” (salary equivalent to one 3 hr course) (PI)

“Enhancing Biochemistry Education by Attending the Education in the Biomolecular Sciences at American Society for Biochemistry and Molecular Biology Meetings 2005”, UCA IDC, \$1091.  
“Type 2 Diabetes and Vitamin A Metabolism”, UCA Summer Stipend (salary equivalent to one 3-hr course).

NASA Research Infrastructure/Student Grant (\$7,500)

UCA Student research Fund: (\$900)

NSF CCLI “Incorporating GC/MS into the Undergraduate Curriculum” (\$129,194) (PI)  
SURF Grant: undergraduate research grant funded with Krissy Posy “Investigation of Substituted Nitroaniline Isomers and Larger Macromolecules using Surface-enhanced Infrared Absorption (SEIRA)” (\$3,900)

Co-PI: “Incorporating Gas Chromatography/Mass Spectrometry (GC/MS) into a Teaching and Faculty-Mentored Student Research Curriculum”, \$129,149 from NSF CCLI Program.

PI: “Radiocarbon Dating Ancient French Cave Paintings”, 2005 URC Summer Stipend (salary equivalent to one 3 hr course).

PI: “Radiocarbon Dating of French Cave Paintings”, 2005 URC Research Grant, \$7912.