

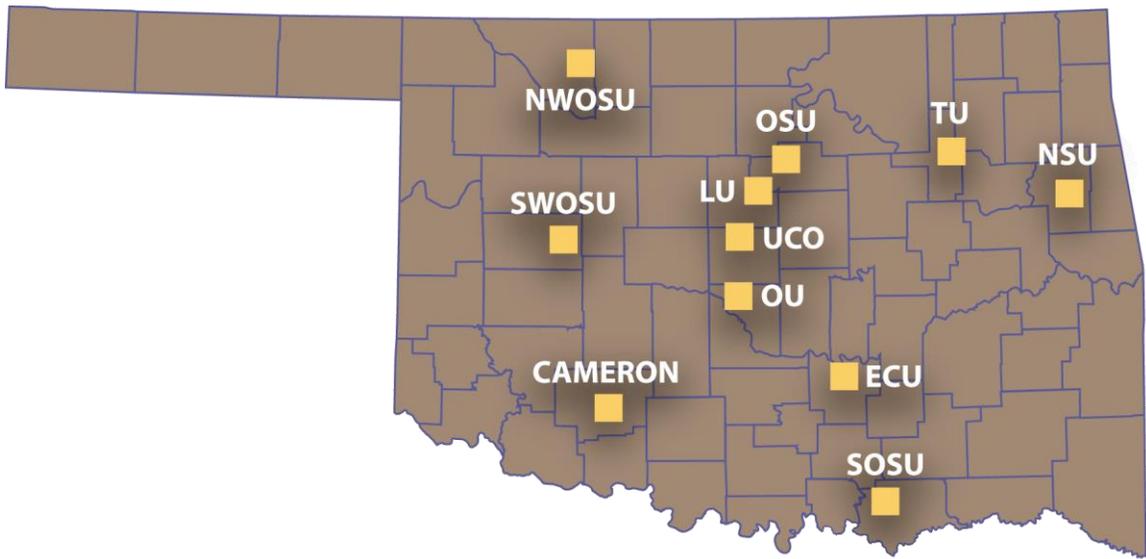
2014 PERFORMANCE EFFECTIVENESS REVIEW

Oklahoma
Louis Stokes Alliance for
Minority Participation
(OK-LSAMP)



Submitted to
The National Science Foundation
4201 Wilson Boulevard
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Arlington, VA 22230





Oklahoma Alliance Institutions

2014
PERFORMANCE EFFECTIVENESS REVIEW
P.E.R.

Oklahoma

Louis Stokes Alliance for Minority Participation
in Science, Technology, Engineering, and Mathematics
(OK-LSAMP STEM)

Submitted by

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INTRODUCTION

The Oklahoma Louis Stokes Alliance for Minority Participation (OK-LSAMP) program concluded *Year Five* of the five year National Science Foundation (NSF) grant (HRD 09020027-2009-2014). This also concludes 20 years of successful LSAMP activities in Oklahoma.

Oklahoma continues to meet the NSF goal to increase the number of minority and under-represented students majoring in science, technology, engineering, and mathematics at the 11 alliance institutions.

In 2013-2014, the Oklahoma Alliance had 257 Scholars; of those, 58 completed Bachelor of Science degrees and 36 of the graduates were admitted to graduate schools. During the academic year 50% of the Alliance scholars participated in research activities, and 30% of the scholars, participated in summer research experiences at national and international locations.

Dr. Jason F. Kirksey, Associate Vice President for Institutional Diversity, Oklahoma State University, became Principal Investigator for the OK-LSAMP Alliance and Program Director for the Bridge to the Doctorate programs. Dr. Kirksey brings with him almost 20 years as a faculty member in the OSU Department of Political Science and a commitment to diversity and the promotion of STEM education across the Alliance. Dr. Simin Pulat, Co-Principal Investigator, University of Oklahoma was replaced by Dr. Susan Walden.

The 19th Annual Research Symposium welcomed over 200 attendees for a day of workshops, poster and oral presentations, ethics training, and guest speakers. Dr. Dwight Adams, Director of the University of Central Oklahoma Forensic Institute and former FBI agent, was the featured speaker.

Oklahoma State University (OSU) admitted 12 former Scholars into the Bridge to the Doctorate program for Cohort VII. Bridge to the Doctorate Fellows from previous cohorts continued to make satisfactory progress toward completing graduate degree requirements.

Oklahoma State University was awarded the annual *Higher Education Excellence in Diversity* award for the second year. This award honors U.S. colleges and universities that demonstrate an outstanding commitment to diversity and inclusion (Appendix A).

Dr. Carl Rutledge, Campus Coordinator, East Central University, received the David and Molly Boren Outstanding Mentor Award for the State of Oklahoma.

A supplemental funding grant was awarded in the amount of \$33,740 for students and faculty who conducted research at the Brookhaven National Labs in Upton, New York.

PROGRAM OBJECTIVES AND ACTIVITIES

The Oklahoma Alliance, consisting of 11 institutions of higher education (three comprehensive research institutions, one historically black university, and seven regional universities), proposed a five-year continuation of Louis Stokes Alliance for Minority Participation activities. Based on 20 years of previous success, the Alliance will continue to support the NSF mission to recruit and retain underrepresented students in the Science, Technology, Engineering, and Mathematics (STEM) disciplines. To accomplish these goals, the following program objectives were proposed and met.

Dr. Jason F. Kirksey, PI, was responsible for submitting the proposal for Phase V funding for the LSAMP program in Oklahoma. Dr. Kirksey, through his role as Associate Vice President for Institutional Diversity, brought a new element into the proposal and a commitment to work with the Alliance Campus Coordinators as the programs grow.

Program Component One

To recruit and retain a minimum of five percent increase yearly in the number of eligible students in STEM fields.

Scholar Demographics

The 11 Oklahoma Alliance institutions supported 257 LSAMP scholars in the 2013 – 2014 academic year. This total reflects a 21% increase from the previous year of 213 scholars. The objective was to increase the number of scholars by 5% each year of the project. Objective One has not only been met, it has exceeded the 5 percent increase in the original proposal (Table 1).

Table 1. Comparison Numbers to Meet Stated Goal

Institution	No. Scholars	
	2012-2013	2013-2014
Cameron	13	12
East Central University	17	19
Langston University	25	40
Northeastern State University	10	9
Northwestern Oklahoma State University	2	7
Oklahoma State University	76	97
Southeastern Oklahoma State University	21	11
Southwestern State University	8	6
University of Central Oklahoma	10	12
University of Oklahoma	24	36
University of Tulsa	7	8
Totals	213	257

Year five also showed more females than males became LSAMP Scholars in the Oklahoma Alliance. Female scholars increased by 29% compared to a 12% increase of males (Table 2). Table 3 compares Scholars by ethnicity.

Table 2. Comparison of Scholars by Gender

Category	Year		Number Increase	Percent
	2012-2013	2013-2014		
Male	102	114	+12	12
Female	111	143	+32	29
	213	257		

Table 3. Comparison of Scholars by Ethnicity

Ethnicity	2012-2013	2013-2014
African American	71	47
Native American	61	100
Hispanic	30	48
Pacific Islander	3	1
Asian American*	5	7
First Generation / Caucasian*	19	25
More than One Race	24	29
Total	213	257

*may have been in unfunded status

On-Site and Community College Recruitment

The recruitment of scholars was evidenced on each of the 11 Alliance institution campuses. Campus Coordinators sought top underrepresented students in the STEM fields. Coordinators used a variety of avenues in the recruitment process. Events such as High School Visitation Days, Freshman Orientation Events, and Parent-Student Campus Tour Days were utilized to identify potential scholars. Additional recruitment was also conducted on-site at high school and community college events. Information tables were set up at science fairs, summer workshops for high school students, tribal events and powwows, as well as personal contact with prospective scholars. OK-LSAMP opportunities were presented during sessions at the first Oklahoma Native American Research Symposium (ONARS), Cherokee Nation Counselor Enrichment Event, Cherokee Nation Foundation College Preparatory Institute (CCPI), and Oklahoma Native American Students in Higher Education (ONASHE) conference, and other events throughout the state.

Alliance schools are actively associated with community and tribal colleges in their region. Campus coordinators work closely with faculty at the community/tribal college to bring students to their campus to complete four year degree programs in the STEM fields. Table 4 shows the connections.

Table 4. Primary Community/Tribal College Connections

Alliance Institution	Community/Tribal College Connection	
Cameron University	Western Oklahoma State College Redlands Community College Amarillo Community College, Texas	Vernon Junior College, Texas Comanche Nation College Fort Sill AFB
East Central University	Murray State College Eastern Oklahoma College Seminole Community College Rose State College	Oklahoma City Community College Redlands Community College Center for Health Sciences – Early Entry: Chickasaw Nation
Langston University	Tulsa Community College Rose State College	
Northeastern State University	NSU – Broken Arrow Campus Tulsa Community College	Connors State College Northeastern Oklahoma College
Northwestern Oklahoma State University	Northern Oklahoma College Enid Campus; Tonkawa Campus; Stillwater Campus	Selmon Living Lab
Oklahoma State University	Northern Oklahoma College, Tulsa Community College	Pawnee Nation College Cheyenne-Arapaho College College of Muskogee Nation
Southeastern Oklahoma State University	Murray State College Eastern Oklahoma State College	Higher Education Center Native American Intertribal Grant
Southwestern Oklahoma State University	SWOSU – Sayre Campus Western Oklahoma State College	Redlands Community College Cheyenne-Arapaho College
University of Central Oklahoma	Oklahoma City Community College Redlands Community College	Northern Oklahoma College
University of Oklahoma	Oklahoma City Community College Rose State College	
University of Tulsa	Tulsa Community College	

Campus Coordinators on Alliance campuses continued to use every avenue available to recruit eligible scholars, from high school visitation days and freshman orientation programs to articles in local newspapers, on-campus flyers, faculty mentor inquiries, and invitation by Scholars and BD Fellows to present their research at specific research programs.

For the second year, the Grant Coordinator participated in the Cherokee Nation College Preparatory Institute (CCPI). CCPI is an intense week-long event where high school juniors and seniors receive instruction and one-on-one help in searching and applying for college programs and funding opportunities. For the 2013 CCPI, almost 100 Native American students received expert advice from college and university admissions counselors and other representatives from across the nation. Institutions represented included: Yale University, Duke University, Dartmouth College, the University of Pennsylvania, the University of Central Oklahoma, the University of Arkansas, the University of Central Arkansas, Bacone College, the University of Illinois Urbana-Champaign, Oklahoma State University, Rogers State University, Stanford University, Northeastern State University, North Carolina State University, and the Cherokee Nation College Resource Center.

Alliance Supplementary Activities

Summer academies/camps, research and bridge programs continue to be a critical part of the Alliance experience and offer a unique time to “get the word out” regarding the OK-LSAMP program and the benefits of being a STEM major and an LSAMP Scholar. Several Alliance institutions held workshops for incoming freshmen and high school juniors and seniors. Each of these workshops offered opportunities for local presentations on the benefits of being a Scholar in the LSAMP program (Appendix B).

Oklahoma State University: As lead institution, OSU continued to participate in several on-campus summer workshops for minority high school students from across the state. OK-LSAMP has close working relationships with several programs. The programs include, but are not limited to:

Retention Initiative for Student Excellence (RISE) and RISE Jumpstart – Programs designed to aid minority and “at-risk” students as they make a smooth transition into college life. This program is designed to assist freshmen and transfer students in developing essential academic skills necessary to successfully matriculate through OSU.

Inclusion Leadership Program (ILP) — A year-long program designed to pair minority college students from the OSU campus with students from high schools in various school districts across the state. The program sponsored by the Williams Companies is designed to develop the skills and knowledge to become effective leaders in a more diversely inclusive society.

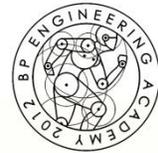
The Retired Educators for Youth Agricultural Programs (REYAP) – Designed to bring underrepresented youth, ages 14-18, to the OSU campus for a week of activities promoting diversity awareness, advocacy, leadership, and education in the STEM disciplines, particularly agriculture.

ConocoPhillips Minority Engineering Program (MEP) Summer Bridge – Designed for incoming freshmen engineering students to spend several weeks on campus, taking class and transitioning into the academic atmosphere prior to the beginning of their first semester. In addition, students have the opportunity to live on the MEP Living Learning Community floor in the dormitory housing.

Additional summer academies and/or workshops included, but are not limited to:
(1) Biology and Engineering for a Sustainable Tomorrow; (2) Exploring Quantitative Analysis: A Basic Introduction; (3) Camp TURF (Tomorrow's Undergraduates Realizing the Future).

The University of Oklahoma: Several residential and day camps for underrepresented youth were organized and offered to underrepresented high school youth throughout the summer. These camps included, but are not limited to:

BP Engineering Academy – A residential camp which encouraged young men who are entering their sophomore, junior, or senior grade level for the fall 2013 semester. The Academy is an opportunity for hands-on exploration in engineering, math, and science.



BP DEVAS Summer Camp (Discovering Engineering Via Adventure in Science) – Designed as a residential camp for young women, with a strong interest in engineering, mathematics, science, and/or technology, a curiosity of how things work, or want to help solve big problems of the world.



AT&T Summer Bridge Program – Designed for incoming freshmen students who have been accepted to the University of Oklahoma and who are planning to major in an engineering discipline. The camp has been designed to help students prepare for the first year of engineering and math coursework.

Additional academies and/or workshops included, but are not limited to: (1) Starship: Imagination; (2) Design and the Built Environment: Collaborate, Create, Construct; (3) All Systems Go! Innovating Engineering Systems for the Future; (4) The Oklahoma Mesonet Presents – Meteorology: From Atmosphere to Zulu; (5) STEM to Store: The Chemistry of Medicine; (6) Exploring Math and Science Academy (EMSA).

Regional Alliance Universities: The regional universities within the Alliance and with support by the Oklahoma State Regents for Higher Education (OSHRE), sponsored summer academies for high school students interested in STEM programs. Over 17,000 public school students have participated in summer academies and 73% of the participants continue on to college in STEM degree programs.

Cameron University: (1) Science Detectives Summer Academy; (2) Nano Explorers: A High School Summer Science Academy.

East Central University: (1) Explorations in Computer Science and Robotics; (2) Coding Theory, Competitive Strategies, Risk Analysis and Other Mathematical Pursuits.

Langston University: (1) Intensive Academy in Math, Science and Technology for Grades 10-12.

Northeastern State University: Get Green for Blue: Outdoor Investigations to Connect Water to You.

Northwestern Oklahoma State University: Exploring the Benefits of Human-Animal Interaction.

Oklahoma State University Center for Health Sciences: Native Explorers.

Oklahoma State University Institute of Technology: Emerging and Converging Technologies Academy.

Southeastern Oklahoma State University: Savage Storm Aviation Science Camp 2013.

Southwestern Oklahoma State University: SSMA: Summer Science and Mathematics Academy.

University of Central Oklahoma: (1) Engineering Physics Exploration, Session I & Session II; (2) Discovering Chemistry in Human Health; (3) CSI: A High School Summer Forensics Academy.

The University of Tulsa: (1) Technology Education and Collaborative (TEC); (2) Summer Engineering Academy.

Data Collection

The Data Coordinator continued to work closely with the Campus Coordinators and the scholars in the collection of data and maintenance of the Alliance database. Data collected on each of the scholars in Oklahoma was used to complete information requested by the National Science Foundation (NSF) and the program evaluator. Data were collected continually throughout the year

with updates to the program on an as-needed basis. The information collected includes, but is not limited to: degree program, presentations, awards, research projects, completion of degree, and acceptance into graduate school. The Alliance management team continued to send regular updates regarding opportunities from across the nation aiming to reach more students and increase the quality of academic opportunities. Scholar email addresses were entered into a **listserv** and used to keep them updated on opportunities such as: summer internships, research opportunities, and conferences. In addition, the **OK-LSAMP Facebook** page was used for more direct contact with scholars. The Facebook page was also used to congratulate scholars on achievements related to research proposals being accepted for national presentations to being admitted to graduate school, accepting internships, and any other highlights for the Scholars. An Alumni listserv was developed. An alumni database was developed and is in the process of being updated with alumni information on current positions, degrees completed, and other relevant information.

Program Component Two

To support scholars academically, personally, and professionally, ensuring they build the connections and skills needed to excel.

Focal points on graduate school preparation included participation in the Graduate Preparation component of the program, interaction with matriculating graduate students, the application process, and research experiences.

- Thirty-six (36) 2013-2014 OK-LSAMP graduates were accepted to graduate schools throughout the nation. Examples include, but are not limited to:

Harvard University
Louisiana State University
Mayo Clinic
University of Oklahoma
University of Pittsburgh
Arizona State University
Oklahoma State University

- Graduate school preparation modules are listed on the OK-LSAMP website (www.ok-lsamp.okstate.edu) for all Alliance institution use.
- Scholars continue to take advantage of the on-line Graduate Record Examination (GRE) preparation course offered to the Alliance scholars through Oklahoma State University-OKC. The classes have been developed to provide learning activities to assist students in acquiring knowledge, practicing skills and completing steps necessary to gain admission to graduate school with successful completion. The classes focus on: (1) what is the GRE; why it should be taken, how to prepare; (2) test-taking skills

relevant to computer aided test format; (3) practice tests; (4) scoring; and (5) average score requirements for specific fields of study.

- Scholar meetings, implemented throughout the Alliance, offered a forum for educational speakers and workshops focused on graduate school preparation and career development.
- Support to state, regional, and national conferences to present research projects. So far during academic year 2013-14, scholars have participated in 170 documented presentations (Table 4). Examples include, but are not limited to:

American Indian Science and Engineering Society (AISES), Denver, CO
 American Institute of Aeronautics and Astronautics-Region IV, Albuquerque, NM
 International Global Conference on Production Safety, New Orleans, LA
 OK-LSAMP Annual Research Symposium, Stillwater, OK
 National Conference on Undergraduate Research (NCUR), Lexington, KY
 National Society of Black Engineers (NSBE), Nashville, TN
 Oklahoma Research Day, Edmond, OK
 Society for the Advancement of Chicanos and Native Americans in Science (SACNAS), San Antonio, TX
 Women of Color STEM, Dallas, TX
 Oklahoma Academy of Science -- 101 Annual Technical Meeting, Edmond, OK

Table 5. Academic Year 2013-14 Scholar Presentations by Institution

Institution	State /				TOTALS
	Local	Regional	National	International	
Cameron University	0	4	0	0	4
East Central University	2	4	1	0	7
Langston University	7	30	9	0	46
Northeastern State University	0	3	0	0	3
Northwestern OSU	0	0	0	0	0
Oklahoma State University	10	35	13	3	61
Southeastern OSU	0	1	0	0	1
Southwestern OSU	6	10	3	0	19
University of Central Oklahoma	0	10	1	0	11
University of Oklahoma	6	2	0	0	8
University of Tulsa	0	6	4	0	10
TOTALS	31	105	31	3	170

Former Scholar Accomplishments

Scholars who have completed degree requirements continue to work toward graduate degrees and positions of significance in the workforce. Below are selected examples:

Justina Bradley – Completed her Master of Science degree in Biomedical Sciences with a concentration in Organizational Development at Philadelphia College of Osteopathic Medicine.

Bubba Brooks – Received the GRFP and is currently completing Ph.D. requirements at the University of California-Berkeley, his first paper was published in the spring issue of *Microbiome*. (Appendix C)

Leethaniel Brumfield, III – Completed the Ph.D. program at North Carolina State University in horticulture science and will be participating in a post-doctoral program at Emory University in Atlanta, GA.

Sidney Carter – Current position is Senior Lab Manager at Karolinska Institute in Stockholm, Sweden. He has lived and worked in Sweden since 2002.

Jonathan Compos – Completed a Master of Science degree in Chemical Engineering from Drexel University and accepted employment with AGC Chemicals as a process engineer in Downingtown, PA.

Paul De LaCerde – Re-elected to a third term on the school board in Los Angeles County and will serve as President (the only Hispanic to be elected). In his current position as Dean, Los Angeles Community College, he has led his campus to receive national awards for STEM education programs. Additionally, he was appointed to the California Statewide Regional Consortium of Community Colleges as Liaison for the Los Angeles region.

Felicia Ekpo – Awarded a GK-12 National Science Foundation Fellowship at the University of Arkansas, where she conducted research in the area of microbiology/food science. Currently, she is a third year medical student at Oklahoma State University College of Osteopathic Medicine, with an expected graduation date of May 2015. In December 2013, she participated in a research project entitled, "Prevalence and Identification of Type 2 Diabetes Mellitus in Chacraseca, Nicaragua", during a medical mission trip to Nicaragua. Her team received 2nd place for the research at the 2014 Annual Tulsa Research Day. In February 2014, she presented her research entitled "Primary CNS Vasculitis" at the Central Illinois Neuroscience Foundation Case Review Conference in Normal, IL. Additionally, she has had two articles published. (Appendix C)

Connor Ferguson – completed degree requirements for the Master of Science degree from the University of Nebraska-Lincoln and was accepted in a Ph.D. program for Weed Science in New Zealand.

Alesia Hallmark – Currently working as a Supervisor of undergraduate laboratories at the University of Miami, will be starting a Ph.D. program at Arizona State University.

Dexter Hunter – Currently employed with Lockheed Martin, San Diego, CA. Dexter has travelled around the world, and along the way promoted STEM programs. He has been to Taiwan 22 times, Jordan two times, and Hawaii two times. Other locations include: Hong Kong, Thailand, Zambia, Russia and many others. Additionally, he will begin a graduate program at George Washington University in the Engineering program.

Lorne Jordan – Transferred to Kansas State University to complete his Ph.D., had an article published in the *Science Daily* on Biochemical role of crucial TonB protein in bacterial iron transport and pathogenesis.

Charles Loftis – Completed requirements for the Doctor of Physical Therapy degree program at Langston University and is currently employed with the Mercy Outpatient Physical Therapy program in Oklahoma City, OK.

Lauren Miller-Simkins – Completed requirements for a Ph.D. in geology at the University of California-Santa Barbara.

Andrew Mock – Received the GRFP and the Graduate Research Opportunities Worldwide (GROW) and is currently serving as a visiting researcher at the ENS Cachan in France.

Katherine Ngo – Accepted a position with Phillips 66 in Texas as a Refining Technical Services Project Engineer following completion of a B.S. degree from OU in May 2014.

Ming Ngo – Accepted a position as Lab Supervisor for Elite Corporation in 2014. The lab is a coordination with the Orthopedic Center in Tulsa, OK. She will be conducting drug testing.

Lila Peel – Accepted a position as Assistant Professor in the Chemistry department at Langston University, Langston, OK.

Elizabeth Saladin – Completed M.D. requirements from Howard University College of Medicine, spent three years in residency at the University of Arkansas, Fayetteville and became a board certified Family Medicine Physician in 2013. Her current position is with the Eastern Band of Cherokee Indians on the reservation in Cherokee, North Carolina.

Ondreia Thomas – Accepted a position as Lead Clinical Lab Technician at the Mayo Clinic on the campus of the National Institute of Health.

Aaron Dwayne Riley – Completed M.S. degree in Medical Physics from the University of Wisconsin at Madison, presented paper at the American Association of Physicists in Medicine, Austin, Texas, and published an article: A. Riley, C. Soares, J. Micka, W. Culberson, L. DeWard, "Absorbed Dose Rate-To-Water at the Surface of a Beta-Emitting Planar Ophthalmic Applicator with a Planar, Windowless Extrapolation Chamber". (Appendix C).

Blake Scott – Completed his first year as a Ph.D. student in Cellular and Molecular Medicine at Johns Hopkins School of Medicine.

Sabrina Scroggins – Completed Ph.D. requirements at the University of Iowa in May 2014, groundbreaking article accepted in *Hypertension on Vasopressin and Preeclampsia*, holds two patents for the research (Appendix C).

Derece Vanterpool – Completing Ph.D. requirements at the University of Oklahoma and serving as an Instructional Designer for the U.S. Postal Service.

Cammi Valdez – Completed Ph.D. requirements at Harvard University in Biological Chemistry and Molecular Pharmacology. She is currently serving as Associate Director of Student Activities at Harvard Summer School and as Program Manager at Massachusetts Institute of Technology (MIT) for the Summer Research Program for students in the STEM fields. Cammi also had an article slated for publication in *The American Journal of Pathology*. (Appendix C).

S. Brett Walker – Completed requirements for the Ph.D. from the University of Illinois and is CEO and Co-Founder of *Electroninks* (the company has designed an ink pen that writes with a conductive ink to be used in schools and by other professionals). Additionally, Brett placed second in the Collegiate Inventor Competition for his work on reactive silver inks. (Appendix C)

Cara Cowan-Watts – Currently serving as a Cherokee Nation Tribal Council member and campaigning for Cherokee Nation Chief.

Daniel H. Wilson – Is the *New York Times* bestselling author of *Robopocalypse* (purchased by DreamWorks and in development with Steven Spielberg attached to direct). He has written nine books, hosted a television show on the History Channel, called *The Works*, published over a dozen scientific papers and holds four patents. His latest novel is was *Robogenesis*, released in June 2014 (Appendix C).

Program Component Three

*To introduce a new focus on enhancing scholar
preparation for global success*

Participants from each Alliance institution are encouraged to take an active part in activities that enhance and assess academic performance, arouse accountability consciousness, and provide other experiences that lend to graduate school and workforce preparation.

- The Annual Research Symposium addressed Scientific Integrity and Ethics with a workshop by qualified ethics instructors.
- Oklahoma State University offers an on-line Responsible Conduct in Research (OCR) course to all Scholars within the Alliance.

- Scholars who were unable to attend the ethics training at the Annual Research Symposium were provided additional opportunities to attend ethics training on their local campus.
- East Central University offers an on-line workshop on Ethics, which is required of all STEM degree candidates. Completion of the class is documented and certificates issued.
- Scholars at the University of Tulsa must complete an Ethics On-Line Workshop prior to receiving funds from the program.
- GRE resource books continue to be provided to each Campus Coordinator in the Alliance. Scholars were encouraged to review the book prior to enrolling in and completing the on-line GRE Preparation course offered through OSU - OKC's Ed-2-Go series.
- Scholars throughout the Alliance are encouraged to apply to three to five graduate schools.
- Scholar meetings are held and used as a means for Scholars to present their research to their peers, hear presentations on graduate school preparation, test taking strategies, study abroad opportunities, and summer internships in addition to a variety of other topics relevant to STEM programs.

Annual Research Symposium

The 19th Annual Research Symposium was held September 21, 2013, on the Oklahoma State University, Stillwater campus (Appendix D). The Symposium welcomed 232 attendees for a full day of workshops, 56 posters, 21 oral presentations, ethics training and guest speakers.

Table 6. Annual Research Symposium Attendees by Category

	Attendees	
	18 th Annual	19 th Annual
Undergraduate Students	112	130
Graduate Students	12	30
Faculty	26	32
Staff	17	13
K-12 Students	1	0
Special Guests	20	27
Total	188	232

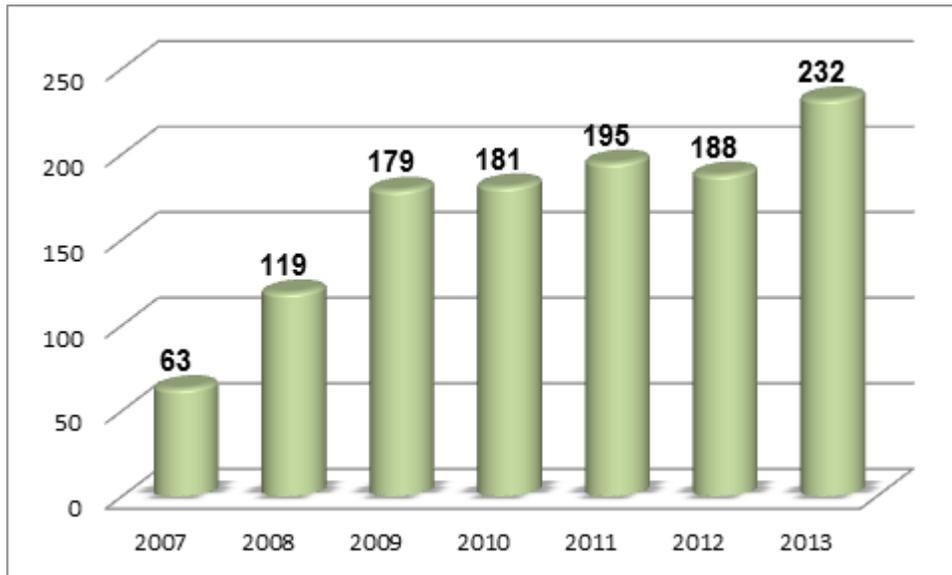


Figure 1. Number of Participants Attending Annual Research Symposium by Year

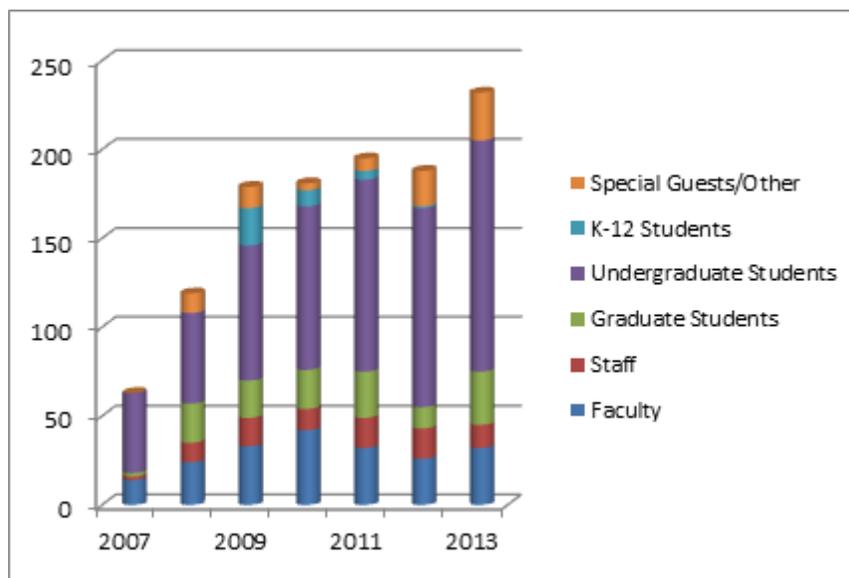


Figure 2. Breakdown of Research Symposium Attendees

International Experiences

In 2013-2014, 21 scholars participated in international experiences. To date, Oklahoma scholars have participated in international research experiences in over 37 different locations. The international opportunities enables scholars to broaden their research experiences. Scholars with international research experiences are better prepared for future career opportunities, develop a diverse perspective on experiences in different locations, and help to build relationships that enhance their future career goals.

Table 7. Select Internship Locations Outside the Continental United States - 2013-2014

Student	Location
Sharonda Carson	Turkey
Sharonda Carson	Greece
Keely Redhage	France
Ashlie Walker	France
Amanda Mathias	Brazil
Linzi Tompson	China
Hannah White	Costa Rica
Morgan James	Costa Rica
Linzi Thompson	Cambodia
Joseph Brown	Japan
Amanda Scoffield	England
Marissa Comeaux	Canada
Jason Semien	Portugal
Jason Semien	Spain
Carlos Garcia	Italy
Kylie Foster	Italy
Ramiro Brigueda	Italy
Bree Cooper	Italy
Kyle Foster	Italy
Skylar Calhoun	Italy
Melicia Matthews	Brazil
Lisa Elizonda	Saipan

The Oklahoma LSAMP program, in coordination with Louisiana State University (LSU), sponsored three Native American LSAMP Scholars for an iREU. The 2014 US/France/Belgium iREU Site in Translational Chemistry, directed by Dr. Randy Duran, LSU, Director of the Office of Undergraduate Research, placed a total of 18 LSAMP Scholars in institutions across France.

Dr. Duran stated, “I suspect this is the only LSAMP program in the U.S. to send so many outstanding Native American women abroad for research projects of this type. It certainly is a first for my 20-year career, which includes work with hundreds of U.S. undergraduates.” Three Scholars from the Oklahoma Alliance were selected to participate in the iREU. **Ashlie Walker** (SWOSU), spent 12 weeks in Grenoble, France, at Joseph Fourier University with plans to extend her stay there to six months. She will work with professors Eric Saint-Aman and Guy Royal. **Keely Redhage** (OSU), spent three months in Lille, France, at the world famous Pasteur Institute with Dr. Priscille Brodin. **Amanda Mathias** (OSU) spent 8 weeks conducting research in animal agriculture in three different labs with professors and the staff of the Federal Rural University in Purnambuco, near Recife, Brazil. Additionally, the Scholars travelled to Washington, D.C. to present a research poster on their current research, state LSAMP program and their projected research projects. The poster session provided opportunities for the students to visit with NSF officials and congressmen.

Linzi Thompson, ECU, was chosen as one of ten to participate in the 2014 REU-China: Ecological and Environmental Research in an Urbanized Landscape at Nanjing Forestry University, Nanjing through Alabama A&M University. She spent ten weeks focusing on ecological and environmental scientific research of the quickly urbanizing landscape of Nanjing Province in China. This research engaged students in a broad range of ecological and environmental scientific research with a focus on hypothesis-driven quantification, experimentation and the modeling of human-induced ecological and environmental changes, particularly ecosystem responses to urbanization (www.aamu.edu).

Native American Scholars from Langston University and Oklahoma State University were selected to participate in the Native American and Pacific Islander Research Experiences (NAPIRE) summer program in Costa Rica. **Hannah White**, Choctaw and **Morgan James**, Cherokee, spent the 10 weeks conducting research with faculty researchers from Guam and Spain. The program provides the students with opportunities not only for research experiences, but article publication, and conference abstracts (Appendix E).

Ethics in Research Training

Each Scholar in the Oklahoma Alliance is required to attend an annual *Ethics in Research* training session. The training may be a seminar such as the one held during the Annual Research Symposium, Scholar meetings, a class, or as a workshop. Scholars attending the ethics session during the Annual Research Symposium are issued a *certificate of completion*. Several Alliance institutions offer a credit course on ethics in which scholars may enroll for credit to be applied to the undergraduate degree requirements. In addition, some scholars are required to meet ethics training requirements within their academic and/or research department(s). Oklahoma State University offers an on-line ethics training class available to all Alliance Scholars without charge.

Monthly Scholar Meetings

Campus Coordinators are responsible for holding monthly scholar meetings on their respective campuses. The meetings are intended to provide support for the scholars while bringing in guest speakers. In addition to guest presenters, scholars were provided opportunities to present their own research to their peers, learn more regarding financial costs of attending school at both the undergraduate and graduate level, how to apply for summer internships, graduate school, and how to create application packets without recreating the wheel every time. The monthly meetings also provide opportunities for the scholars to develop personal friendships with other scholars outside of their field of study.

Program Component Four

To institutionalize effective pathways to STEM graduate study and careers at all Alliance institutions.

The inter-institutional collaboration among the 11 Alliance institutions continues to serve as the catalyst for establishing comprehensive and coherent programming aimed at enhancing the academic preparedness of targeted undergraduate students for graduate studies.

In the July 2013 printing of *Diverse Issues in Higher Education*, Oklahoma universities consistently rank in the top for awarding degrees to Native Americans. Seven Oklahoma universities in the OK-LSAMP Alliance rank in the top 30 institutions for Native Americans completing degree requirements. Statistical data for the 2014 printing of top minority degree producers has been delayed and not reported for 2014.

Seventy (70) Scholars completed Bachelor of Science degrees in the 2013-2014 academic year. Thirty-six (36) of the Scholars receiving a B.S. degree (62%) have been admitted to advanced degree programs at universities across the United States. Additionally, of the 2013-2014 graduates admitted to graduate school, 10 were males and 26 were females, compared to the 2012-2013 year of 12 males and 5 females.

Table 8. Number of Graduates by Institution and Number Attending Graduate School

Alliance Institutions	2012-2013 Graduates		2012-2013 To Grad School		2013-2014 Graduates		2013-2014 To Grad School	
	Male	Female	Male	Female	Male	Female	Male	Female
Cameron University	0	0	0	0	0	4	0	3
East Central University	5	2	1	0	2	1	0	1
Langston University	2	6	0	2	2	8	1	2
Northeastern State University	1	1	1	0	1	2	1	1
Northwestern OSU	0	1	0	1	1	0	0	0
Oklahoma State University	8	5	5	1	10	15	5	12
Southeastern OSU	2	1	0	0	3	2	1	1
Southwestern	1	1	0	0	1	0	0	0
University of Central OK	0	1	0	0	1	1	0	0
University of Oklahoma	7	3	5	1	6	7	1	5
University of Tulsa	0	0	0	0	2	1	1	1
TOTALS	26	21	12	5	29	41	10	26
	47		17		70		36	

- All Alliance institutions offer scholar programs including, but not limited to: (1) financial and academic support; (2) academic year research mentoring components; and (3) a summer research internship program. Across the Alliance, these programs focus on retention, high academic achievement, and graduate school preparation.
- Tutoring is available for students experiencing difficulty with coursework. The OK-LSAMP program provides compensation to the tutor. Scholars were also referred to Student Success Centers to receive tutoring and study techniques as well as a peer mentor.
- Seven scholars traveled to Lexington, Kentucky, for the 2014 National Conference on Undergraduate Research (NCUR). Annually, this trip is funded in part by EPSCoR.
- OSU Scholars participated in research projects sponsored by the Office of Scholar Development. Students are selected to participate as a Freshman Researcher, and may advance their research support further by applying for the NIBLACK Foundation (an \$8,000 scholarship) and/or the Wentz Research Project (\$2750 - \$4,500). The scholars are able to conduct their own research during the academic year (sometimes continued into the summer) and present the results at individual research venues.
- Scholars participated in the National Society of Black Engineering Conference, Nashville, TN.

- Scholars presented posters and oral presentations, in addition to taking first place honors, at the 2014 Emerging Researchers National Conference, Washington, D.C..
- Scholars participated in summer internship/research positions throughout the nation and the world.
- Inter-institutional collaboration – each summer, a number of scholars conduct internships at Alliance institutions. Each Alliance institution is funded to offer summer internship opportunities on their campus, but, because of inter-institutional collaboration, scholars may also conduct research on Alliance campuses.
- Bridge to the Doctorate Fellows from both OSU and OU participated in the Annual Research Symposium. This allowed scholars to ask individual questions regarding graduate school and receive feedback from someone with whom they can relate.
- Graduate school preparation modules and helpful handouts are located on the OK-LSAMP website for use by all Alliance Institutions.
- Alliance meetings with the program administration and Campus Coordinators are held. The meetings are a forum for ongoing communication on overall program operation and specific program implementations on each campus.
- A web page continues to be maintained by OSU as the lead institution. The page contains active links to the National Science Foundation and Alliance Institutions. Additional links include Alliance activities, forms, current and past newsletters, reports, and graduate school information. The web address: www.ok-lsamp.okstate.edu.
- Program newsletters and other program publications enhance communications between Alliance institutions, maintain the coherence of the program, and provide informational recruiting material for new scholars, mentors, and program supporters.
- The data system developed for the Alliance with information on current and alumni scholars and Bridge to the Doctorate Fellows continues to be upgraded and improved. Information includes, but is not limited to: major, presentations at workshops/ conferences, internships, GPA, degrees awarded and graduate school applications.
- An Alumni database continues to be updated with scholar information. Information returned by alumni will be used to stay connected and to keep alumni informed of upcoming events.

Research / Internship Experiences

Scholars are encouraged to participate in academic year and summer internship programs locally, nationally, and internationally. The academic year research experiences provide

opportunities for Scholars to work closely with faculty mentors on their campuses and to learn from some of the best researchers in their field. The summer internship program allows scholars to gain first-hand experiences in their chosen career fields, while learning new skills and acquiring skills that will help them transition from the academic environment into their future work environment. Internships also allow the scholars to apply what they have learned in the classroom to real-work situations.

Table 9. Academic Year Research Experiences

Institution	Spring Semester 2013	Summer Internship 2013	Fall Semester 2013	Spring Semester 2014	Summer Internship 2014
Cameron University	2	6	6	5	0
East Central University	3	2	3	2	5
Langston University	2	13	11	9	8
Northeastern State Univ.	6	3	5	3	2
Northwestern OSU	1	0	0	0	0
Oklahoma State Univ.	31	40	41	45	34
Southeastern OSU	8	11	7	6	3
Southwestern OSU	5	3	4	5	4
Univ. of Central OK	9	6	10	11	5
University of OK	8	6	9	12	9
University of Tulsa	0	6	5	5	7
TOTALS	75	96	101	103	77

Internship Partnerships

One of the goals of the OK-LSAMP program is to have each Scholar complete applications to a minimum of three internship locations. The following represents a partial list of internship locations.

Alaska Sea Life Center, Seward, AK – Alaska’s only public aquarium and ocean wildlife rescue center. Additionally, the Center is a cold-water research facility designed to understand and maintain the integrity of the marine ecosystem of Alaska through research, rehabilitation, conservation, and public education (alaskasealife.org).

BP Oil Company, Houston, TX – BP is one of the world's leading international oil and gas companies, providing its customers with fuel for transportation, energy for heat and light, retail services and petrochemical products for everyday items. (bp.com)

Boeing Corporation, Seattle, WA – Leading manufacturer of commercial jetliners and military aircraft combined. Additionally, Boeing designs and manufactures rotorcraft, electronic and defense systems, missiles, satellites, launch vehicles, and advanced information and communication systems.

Brookhaven National Labs (BNL), Upton, NY – A unique opportunity for LSAMP scholars to participate in a 12-week research project with BNL staff and an on-campus mentor. BNL is a multipurpose research institution funded primarily by the U.S. Department of Energy's Office of Science. BNL brings world-class facilities and expertise to the most exciting and important questions in basic and applied science—from the birth of our universe to the sustainable energy technology of tomorrow. (BNL.gov)

Chesapeake Energy, Oklahoma City, OK – The second largest producer of natural gas, a Top 15 producer of oil and natural gas liquids, and the most active driller of new wells in the United States. (chk.com)

Chevron, Bakersfield, CA – Chevron has major operations in the world's most important oil and gas regions. The Company is a leader in working in extremely difficult environments such as ultradeep water. Chevron is also a leader in refining, fuels, lubricants and additives. Chevron's interests range from chemical production and mining to energy research and nanoscience. Along with a range of power facilities, they are also the world's largest producer of geothermal energy. (chevron.com)

Chrysler Corporation, Toledo, OH – An automobile company designed on strong engineering and a design reputation that is recognized in the industry. Students have opportunities to participate in numerous internships and leadership programs.

Clemson University, Clemson, SC – Data-intensive research is characterized by the need to efficiently acquire, store, transmit, manipulate, visualize, search, and analyze massive data sets. In recent years, investment in large-scale high-performance computing infrastructure has enabled an exciting opportunity to address "Big Data" problems that are becoming increasingly common in nearly every area of science and technology. Co-funded by the Department of Defense in partnership with the National Science Foundation. (<http://clemson.edu/reu/>)

Colorado School of Mines, Golden, CO – This Engineering Research Center for Re-Inventing the Nation's Urban Water Infrastructure (ReNUWIt) is a public research university devoted to engineering and applied science. The ReNUWIt program is an interdisciplinary, multi-institution research center whose goal is to change the ways in which people manage urban water. The vision is of safe, sustainable urban water infrastructures enabled by technological advances in natural and engineered systems, and informed by a deeper understanding of institutional frameworks. (urbanwatererc.org)

ConocoPhillips, Bartlesville, OK – The third-largest integrated energy company in the United States, the fourth largest refiner, and the sixth largest reserves holder of non-government controlled companies, known for worldwide technological expertise in reservoir management and exploration. (www.conocophillips.com)

Department of Defense, Houston, TX – U.S. Customs and Border Patrol Laboratories. The Oak Ridge Associated Universities (ORAU) program consisted of working with marijuana to determine geographical origin based on cannabinoid profile of a given marijuana sample.

Devon Energy Corporation, Oklahoma City, OK – Devon is an independent oil and gas company that explores for and produces oil and natural gas worldwide.

Enable Midstream Partners, Oklahoma City, OK – A publically traded master limited partnership formed in May 2013 that owns, operates and develops strategically located natural gas and crude oil infrastructure assets serving major producing basins and markets. (enablemidstream.com)

EXCO Resources, Holly, LA – A natural gas and oil company engaged in the exploration, exploitation, acquisition, development and production of onshore natural gas and oil properties. (excoresources.com)

ExxonMobil, Houston, TX – Exxon Mobil has been a leader in the energy industry since its beginnings. Exxon is the world's largest publicly traded international oil and gas company providing energy that helps underpin growing economies and improve living standards around the world. (www.exxonmobil.com)

FMC Technologies, Houston, TX – The global leader for the energy industry providing oil service equipment for sophisticated systems and products such as subsea production and processing systems, surface wellhead systems, high pressure fluid control equipment, measurement solutions, and marine loading systems for the oil and gas industry. (fmctechnologies.com)

Joseph Fourier University, Grenoble, France – The Université Joseph Fourier in Grenoble is a leading University of Science, Technology and Health. It brings together the various stakeholders from Grenoble's healthcare industry (doctors, pharmacists, biologists and chemists, as well as STAPS research professors) working on numerous local or regional research programs, such as NanoBio, Cancéropôle Lyon Auvergne Rhône-Alpes, Rhône-Alpes Genopole, Neurosciences or Envirhônealp. The diversity of these stakeholders and of the skills found within the CSVSB Centre makes it possible to conduct research programs ranging from basic research to clinical applications. (<http://www.ujf-grenoble.fr/research/chemistry-biology-and-health>)

Genome Institute, St. Louis, MO – Washington University. Increasing diversity in genomics through training and related sciences and to provide mechanisms for them to pursue higher levels of education.

Institut Pasteur, Lille, France – The Institut Pasteur is the site of one of the most dynamic and innovative research campuses in the world. Numerous people and nationalities are represented with Louis Pasteur's plans to create dynamic focus for scientists from all over the world to work together on a common aim, to improve human health and welfare through scientific discovery. The multidisciplinary nature of the Paris campus and its work is one of the many major strengths of the Institut Pasteur. (www.pasteur.fr/ip/easysite/pasteur/en)

Microsoft Corporation, Sacramento, CA – Worldwide leader in software, services, and solutions that help people and businesses realize their full potential.

Nanjing Forestry University, China – The program, sponsored through Alabama A&M University, will focus on ecological and environmental scientific research of the quickly urbanizing landscape of Nanjing Province in China. This research will engage students in a broad range of ecological and environmental scientific research with a focus on hypothesis-driven quantification, experimentation and the modeling of human-induced ecological and environmental changes, particularly ecosystem responses to urbanization. (www.aamu.edu)

National Instruments, Austin, TX – National Instruments equips engineers and scientists with tools that accelerate productivity, innovation, and discovery to meet not only grand but also daily engineering challenges in an increasingly complex world. A graphical system design approach leverages productive software and reconfigurable hardware platforms, along with a vast community of IP and applications, to simplify system development and arrive at solutions faster. (ni.com)

Native Explorers, Tulsa, OK – The program combines vertebrate fossils and medicine into a scientific expedition. Students explore anatomy at the OSU Center for Health Sciences and conduct a paleontological dig and cultural excursions.

Niblack Research Scholarship Program, Stillwater, OK – The program supports research of undergraduates on the Oklahoma State University-Stillwater campus. Recipients are sponsored by a member of the research faculty to oversee the progress of the research with day-to-day monitoring.

Northrop Grumman, El Segundo, CA – An American global aerospace and defense technology company formed by the 1994 purchase of Grumman by Northrop. The company was the fourth-largest defense contractor in the world as of 2010.^[4] Northrop Grumman employs over 68,000 people worldwide.

Norman Regional Hospital, Norman, OK – Norman Regional Health System is a multi-campus system that serves healthcare needs throughout south central Oklahoma. NRHS is operated by Norman Regional Hospital Authority, a public trust, which serves the public interests and functions as a political subdivision of the State of Oklahoma. (www.normanregional.com)

Oklahoma Department of Transportation, Oklahoma City, OK – Since 1911, Oklahoma Department of Transportation employees have worked to provide a safe, economical and effective transportation network for the people, commerce and communities of Oklahoma. Beginning with four employees to a workforce of 2,400 ODOT has always had one thing in mind: Oklahoma. ODOT has built and continues to maintain enough miles of highway to drive from Oklahoma City to Los Angeles 22 times.

Oklahoma IDeA Network of Biomedical Research Excellence (OK-INBRE): A grant awarded by the National Institutes of Health Institutional Development Award (IDeA) Program. The Network is comprised of two lead institutions whose primary missions are biomedical research, education and patient care, and 12 collaborating institutions. OK-INBRE builds State capacity to carry out biomedical research by supporting promising new faculty, recruiting

students into biomedical research careers, and sustaining vital core facilities. The scientific themes of OK-INBRE are multi-disciplinary, targeting the fields of Microbiology & Immunology, Cancer, and Developmental Biology. (okinbre.weebly.com)

Oklahoma State University, Stillwater, OK – Biological Basis of Human and Animal Behavior. This NSF sponsored REU program is a research project for 12 scholars through the OSU Department of Psychology. Students will be trained in the application of the scientific method to develop hypotheses, design and conduct research studies involving either animal or human subjects.

Organization for Tropical Studies (OTS) Native American and Pacific Islander Research Experience (NAPIRE), Costa Rica – OTS is a non-profit consortium that has grown to include 63 universities and research institutions from the United States, Latin America and Australia. In the early 1960s, scientists from U.S. universities forged working relationships with colleagues at the Universidad de Costa Rica in the interest of strengthening education and research in tropical biology. (www.ots.ac.cr)

Phillips 66 Oil Company, Houston, TX – Built on more than 130 years of experience, Phillips 66 is a growing energy manufacturing and logistics company with high-performing Midstream, Chemicals, Refining, and Marketing and Specialties businesses.

Research Experiences for Undergraduates (REU) – REU programs are funded by the National Science Foundation and conducted on specific campuses in specific programs. Programs in which OK-LSAMP scholars participated include, but are not limited to: Clemson University, University of Oklahoma, Oklahoma State University, Alabama A&M University (China), Louisiana State University (Brazil and France), University of Georgia; Washington University School of Medicine, St. Louis, MO, and the University of Wisconsin-Madison.

Rocky Mountain Biological Lab, Crested Butte, CO – RMBL specializes in the development and production of high performance sera, protein fractions, and cell culture media supplements needed for both lab and diagnostic purposes. (rmbio.com)

Shell Oil Company, worldwide – A global group of energy and petrochemical companies located in more than 80 countries and territories. (www.shell.com)

SouthWest Nanotechnologies, Norman, OK – Produces carbon nanotubes using the patented CoMoCAT® catalytic method in fluidized bed reactors, founded in 2001 to commercialize nanotube technology developed by Professor Daniel Resasco at the University of Oklahoma.

University of California, Los Angeles, CA – Research in Industrial Projects for Students (RIPS) program at the Institute for Pure and Applied Mathematics (IPAM). The project was in conjunction with Google LA.

University of Georgia, Athens, GA – The Population Biology of Infectious Diseases REU Site to train undergraduates in scientific methods at the intersections of quantitative and experimental studies in infectious disease biology.

Universidade Federal Rural de Pernambuco (UFRPE), Recife, Brazil – Is an institution of high education in Brazil, specializing in courses in agricultural sciences and other courses that "compete or will compete for the development of rural areas." UFRPE has three campuses, one in Recife (headquarters), one in Garanhuns (Wasteland) and another in Serra Talhada (Hinterland).

University of Oklahoma Advanced Radar Research Center, Norman, OK – Involved in many aspects of radar research applied to studies of the atmosphere. Topics range from sophisticated radar signal processing to precipitation microphysical studies. The over-arching goal is to provide students the most comprehensive educational experience in radar, applied electromagnetics, electronic warfare, atmospheric science, and remote sensing in the world. This is accomplished by creating a synergistic curriculum exploiting the complementary disciplines of meteorology, electrical and computing engineering, and system-level thinking. (arrc.ou.edu)

University of Pittsburgh Human Engineering Research Laboratories, Pittsburgh, PA – The REU participants worked in rehabilitation engineering and assistive technology. Students designed and fabricated the housing of a novel robotic wheelchair controller using 3D printing, as well as designed and implemented a graphical user interface into the controller.

Wal-Mart, Los Angeles, CA – Wal-Mart helps people around the world save money and live better -- anytime and anywhere -- in retail stores, online and through their mobile devices. Each week, more than 245 million customers and members visit the nearly 11,000 stores under 71 banners in 27 countries and e-commerce websites in 10 countries. With fiscal year 2014 sales of approximately \$473 billion, Wal-Mart employs 2.2 million associates worldwide. (Wal-Mart.com)

Washington University School of Medicine, St. Louis, MO – Understanding Complex Diseases (e.g., Alzheimer's and cancer) through Systems Biology.

Williams Companies, Tulsa, OK – An energy infrastructure company focused on connecting North America's significant hydrocarbon resource plays to growing markets for natural gas, natural gas liquids (NGLs) and olefins. Williams' operations span from the deep water Gulf of Mexico to the Canadian oil sands. (www.williams.com)

EVIDENCE OF INSTITUTIONALIZATION

AND OUTREACH

Scholars are provided opportunities to gain knowledge, insight and experiences in their programs of study and research. These experiences help them to develop better ideas of which directions they may want to pursue and to provide opportunities to work together with their peers. Selected opportunities are identified below.

Indigenous Scholar Development

Scholars are involved in activities on Alliance campuses to strengthen the culture of learning and discovery between students and faculty in relation to indigenous cultures. On the Northeastern State University campus in Tahlequah, a predominantly Native American population, OK-LSAMP scholars were involved for the second year as mentors in the Indigenous Scholar Development Center. The Center's mission is to *“strengthen the capacity of NSU to provide a comprehensive, holistic approach to serving American Indian Students and their Communities through extensive programming, creative implementation of academic success strategies and supporting faculty and staff development, while creating a safe place for Indigenous peoples to gather, learn from and strengthen each other.”* Campus Coordinator, Jody Buckholtz, continues to serve as the faculty academic advisor.

The Oklahoma Native American Students in Higher Education (ONASHE) program was implemented to support Native American students in higher education by hosting a yearly event to promote interaction among tribal leaders and students. The mission of *“ONASHE is to provide opportunities for students to continue to develop and strengthen their leadership skills by interacting with current tribal leaders, participate in workshops that are relevant to contemporary student and leadership issues and fellowship with students.”* The ONASHE conference is held on a different Alliance campus each year with Native American OK-LSAMP scholars and Native American students from the campus overseeing the conference logistics (Appendix F).

Alliance campuses also have Native American Student Associations and/or Native American Student Centers. These groups encourage Native American students to pursue careers in higher education, while focusing on protection and preservation of Native history and cultures. On the OSU campus, Native American students and faculty may become involved in the Native Americans Resiliency through Education and Leadership Program (NARELP). NARELP was designed to promote the successful transition of incoming freshmen and transfer students to the OSU community, as well as promoting mentorship, leadership, and community for all Native American students in order to build a stronger Native American community on and off campus.

National Conference on Undergraduate Research

The National Conference on Undergraduate Research (NCUR) is held annually to provide opportunities and *“is dedicated to promoting undergraduate research, scholarship, and creative activity in all fields of study”* (NCUR, 2014). In 2014, the Oklahoma LSAMP Alliance had 7 scholars attend the conference and present research by poster and/or oral presentation. Scholars attending also had opportunities to attend a career/graduate school fair and to learn the culture of the area. (Appendix G)

Oklahoma Research Day

Oklahoma Research Day celebrated its 15th year as a premier annual event celebrating student and faculty research, creative, and scholarly activities. The event has grown in numbers and in stature with contributions from all of Oklahoma's institutions of higher education, including many collaborative contributions from national and international academic and research institutions. The 2014 Oklahoma Research Day event had over 1,200 registered students, faculty, and guests and featured over 700 unique poster presentations. (oklahomaresearchday.com) (Appendix H)

The University of Central Oklahoma hosted the 2014 Oklahoma Research Day event. The one-day conference provides students with opportunities to present their research and to interact with peers and others in their research fields. The Oklahoma LSAMP Alliance had a total of 45 Scholars participate in the event.

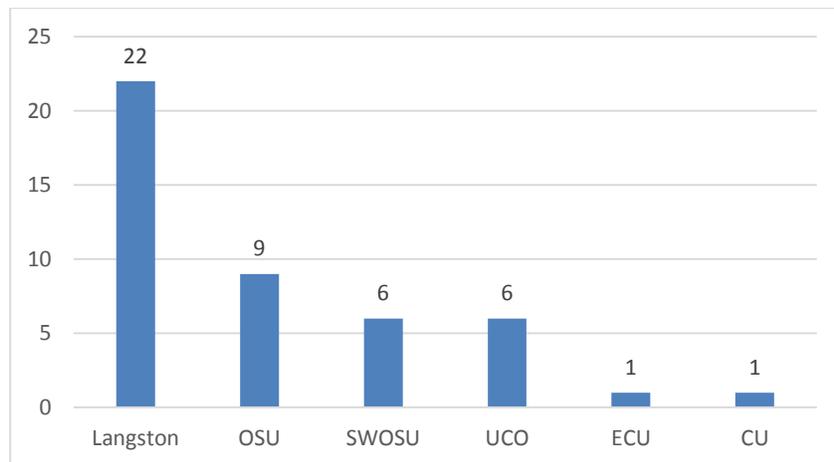


Figure 3. Number of Scholars by Institution Participating in the 2014 Oklahoma Research Day

Table 10. Scholars Participating in Oklahoma Research Day by Institution

School	Scholar	Scholar	Scholar
Cameron University	Melissa Merrifield		
East Central University	Linzi Thompson		
Langston University	Deborah Bowman Evann Comeaux Lindsey Davis Eugene Deloach Beautiful Joy Fields Amber German	Tiffany Glover Ryan Johnson Njemile Miro Kellyn Pollard Densel Pugh Jodeci Ross	Rajah Singh Laurence Smith Brittany Vann Quintin Walker Gabby Williams
Oklahoma State University	Zoe Austin Ana Chicas-Mosier Sarah Hamilton	Stephen James Geoff Kibble Troy King	Sheri Toal Carolina Vega
Southwestern Oklahoma State University	Irene Lopez	Mary Ann Phillips	Ashlie Walker
University of Central Oklahoma	Sharonda Carson	Juan Orozco	JR Redd Jessica Webb

Society for the Advancement of Chicanos and Native Americans in Science (SACNAS)

The annual SACNAS conference was held in San Antonio, Texas. For the second year, Scholars received travel scholarships to attend the conference and participate in activities; i.e., poster presentations, career fair, Native American PowWow, and the Hispanic Pachanga dance. The SACNAS conference celebrated its 40th Anniversary and 25 OK-LSAMP scholars were in attendance. The conference provided opportunities for graduate school updates and admission procedures, a career fair, as well as workshops on a variety of topics.

Oklahoma State University completed year two in a three-year partnership with SACNAS for the *Scholars in Science: Native American Path* (SSNAP) project. The project goal is to recruit and retain 30 Native American participants to incorporate pre-conference activities focusing on conference preparation and post-conference activities and evaluation. At the SACNAS conference, project participants met with other Native American elders and participated in a PowWow/Grand Entry into the event. Additional benefits include a travel scholarship to the conference. Dr. Dave Wilson, Deputy Director of American Indian Affairs and Policy for

SACNAS and Ms. Annabel Ortiz, SACNAS Native American Liaison, visited OSU twice to conduct workshops. The workshops presented by Dr. Wilson and Ms. Ortiz prepared the students for the SACNAS conference and provided them with one-on-one encouragement and opportunities to discuss concerns and expectations about the SSNAP program and SACNAS in general. The SSNAP opportunity was directed by Dr. Gilbert John, a faculty mentor at OSU and Kay Porter, OK-LSAMP Program Manager. (Appendix I)

Women of Color STEM Conference

The Women of Color STEM Conference recognizes outstanding women in the STEM fields and provides excellent opportunities for professional development, networking, and recruiting. The conference is co-sponsored by CCG's *Women of Color* magazine and the IBM Corporation. The 2013 conference was held in Dallas, Texas, October 17-19. Three Scholars received student achievement awards: Linzi Thompson, East Central University, Outstanding Research Award; Evann Comeaux, Langston University, Outstanding Leadership; and Shelby Fraser, SEOSU, Outstanding Leadership Award. Kay Porter, program manager, served as a panelist on two breakout sessions; and Fara Williams, data coordinator, also attended the conference. Forty-students and sponsors from Alliance schools were in attendance. (Appendix J)

Women in Science

The Women in Science conference is an annual event hosted by Oklahoma EPSCoR, staff, students, and faculty from universities and colleges across Oklahoma. The conference registered over 700 junior and high school females and over 100 teachers. Additionally, there were over 190 exhibitors, including representatives from academic, government, business, and the non-profit sector with information regarding college admission, scholarships, and professional activities. (Appendix K)

Oklahoma Women in STEM

The First Annual Oklahoma Women in STEM Conference was held in Tulsa, Oklahoma. The conference was designed, through collaborative efforts, to encourage young women to explore options and opportunities in STEM careers. The conference provided insights into *Breaking the STEM Glass Ceiling* by encouraging communication between young women across the state, educators and business professionals to provide encouragement and support to break-down barriers for women interested in STEM careers in Oklahoma. Oklahoma State University had the largest representation of female students in attendance and received the *Collegiate Trophy*. (Appendix L)

Cherokee Nation Science Fair

Each year, OK-LSAMP Scholars and members of the American Indian Science and Engineering Society (AISES) Chapters serve as judges and event leaders for the Cherokee Nation Science and Engineering Fair (CNSEF). January 25, 2014, marked the Seventh Annual Cherokee Nation Science Fair and provided opportunities for OK-LSAMP Scholars to participate. As judges, Scholars evaluated and focused on what the students have done; how well a student followed the scientific, engineering, computer programming or mathematical methodologies; the detail and accuracy of research as documented in the data book; and whether experimental procedures were used in the best possible way. Categories include animal sciences, chemistry, computer science, biochemistry, environmental management, engineering, microbiology and medicine and health sciences among many other categories. Additionally, students in the OSU AISES chapter hosted a “hands-on” exhibit designed to teach students how to build a structure that would not turn over when hit with a ping pong ball. (Appendix M)

Beta Kappa Chi

Founded in 1923 by the science faculty and science students of Lincoln University, Lincoln University, Pennsylvania, Beta Kappa Chi National Honor Society is a collegiate honor society dedicated to the promotion of high scholarship in pure and applied sciences. A member of the Association of College Honor Societies since 1961, Beta Kappa Chi now comprises 67 chapters at colleges and universities across the United States, with over 66,000 members.

Scholars from Langston University, along with the Campus Coordinator, Dr. Sharon Lewis, travelled to the national conference to present research projects and to participate in conference activities. (Appendix N)

NSF-LSAMP Internship Program at BNL

Oklahoma State University was awarded a supplemental grant for the 2014 summer with Brookhaven National Laboratory (BNL) located in Long Island, New York. Dr. Gilbert John, professor and faculty mentor from OSU led the project. Two scholars, one from OSU and one from Northwestern State University participated in the 10-week program. The project entitled *Crystallization and X-Ray Diffraction Studies of Azoreductase from Clostridium Perfringens and Enterococcus faecium* began in a lab on the OSU campus and worked closely with the Environmental Science Department within BNL. The Scholars and faculty mentor spent 8 weeks on the BNL campus, experiencing research techniques in a national lab, taking part in cultural activities, and participating in a sponsored research symposium.

FACULTY HIGHLIGHTS AND PUBLICATIONS

Campus Coordinators and mentors are an integral part of the OK-LSAMP program. They not only hold faculty rank at their respective institutions, they also have a dedication to the education of America's underrepresented youth and support the NSF goals and objectives related to the LSAMP program. Coordinators and mentors are continually striving to achieve success within their own career paths. Several highlights are below and in Appendix G).

Carl Rutledge

Awards & Recognition:

January 2014, Dr. Rutledge was awarded the David and Molly Boren Mentor Award for his outstanding mentoring of OK-LSAMP Scholars. The award, sponsored by the Foundation for Excellence, was presented on the Oklahoma Senate floor at the Oklahoma State Capitol in Oklahoma City, with family, friends, and former students in attendance (Appendix O).

Tim Hubin

Publications:

Smith, R.; Khan, A.; Burke, B.P.; Nicholson, K.; Greenman, J.; Madden, L.; Schols, D.; De Clercq, E.; Fruhwirth, G.; Hubin, T. J.; Ng, T.; Archibald, S. J. (2013). "A new high affinity small molecule metal containing CXCR4 antagonist functionalized for conjugation." *submitted*.

Houser, R. P.; Wang, Z.; Powell, D. R.; Hubin, T. J. (2013). "Copper(I) and Copper(II) complexes with pyrazine-containing pyridylalkylamide ligands N-(pyridin-2-ylmethyl)pyrazine-2-carboxamide and N-(2-(pyridin-2-yl)ethyl)pyrazine-2-carboxamide." *J. Coord. Chem. in press*,

Presentations: *students

Khan, M. F.; Hubin, T. J. Amoyaw, P. A.; Pham, K. L.; Tekwani, B. L. "Macrocyclic Polyamine Derivatives and Their Metal Complexes as Antileishmanial Leads." (2013, Nov. 10-14). American Association of Pharmaceutical Scientists Annual Meeting, San Antonio, TX

Khan, M. F.; Hubin, T. J. Amoyaw, P. A.; Tekwani, B. L. (2013, Nov. 10-14). "Antimalarial Activity of Metal Complexes of Cross-Bridged Tetraazamacrocyclic Ligands." American Association of Pharmaceutical Scientists Annual Meeting, San Antonio, TX.

*Davilla, D.; *Klassen, S. L.; *Epley, B. M.; *Le, J.; Hubin, T. J. (2013, Nov. 14-16). "Development and Synthesis of Propyl Cross-Bridged Cyclam Ligands as CXCR4-Antagonists." Annual Biomedical Research Conference for Minority Students (ABRCMS). Nashville, TN.

*Walker, A.; *Le, J.; Hubin, T. J. (2013, Sep. 21). "Development and Synthesis of Propyl Cross-Bridged Cyclen Ligands as CXCR4-Antagonists." OK-LSAMP State Research Symposium. Stillwater, OK.

*Davilla, D.; *Klassen, S. L.; *Epley, B. M.; *Le, J.; Hubin, T. J. (2013, Sep. 21). "Development and Synthesis of Propyl Cross-Bridged Cyclam Ligands as CXCR4-Antagonists." OK-LSAMP State Research Symposium. Stillwater, OK.

*Klassen, S. L.; *Davilla, D.; *Epley, B. M.; *Le, J.; Hubin, T. J. (2013, July 19). "Development and Synthesis of Propyl Cross-Bridged Cyclam Ligands as CXCR4-Antagonists." INBRE Summer Research Student Symposium. Oklahoma City, OK.

Ongoing Research Support

Development and Screening of Transition Metal Complexes as Chemokine Receptor Antagonists
Henry Dreyfus Teacher-Scholar Award Unrestricted Grant: Henry & Louis Dreyfus Foundation (10/01/12 - 9/30/17).

Novel Topologically Constrained Transition Metal Oxidation Catalysts

American Chemical Society Petroleum Research Fund Undergraduate Research Grant

The goal of this complex is to produce novel Cu, Mn, and Fe complexes that function as oxidation catalysts. (07/01/13 - 08/31/16).

Dual CXCR4/CCR5 Chemokine Receptor Antagonists

Oklahoma Center for the Advancement of Science and Technology Health Research Grant:

The goal of this project is to make new compounds that antagonize both CXCR4 and CCR5 chemokine receptors. (09/01/13 - 08/31/16).

Louis Stokes Alliance for Minority Participation in Science, Mathematics, Engineering, and Technology NSF (Oklahoma Consortium Administrated through OSU): The goal of this program is to encourage underrepresented minorities to pursue STEM degree programs. (05/01/09 - 10/31/14).

Synthesis and Evaluation of Transition Metal Complex Dual CXCR4/CCR5 Antagonists

OK-INBRE Mini Grant: This project's goal is to make & test compounds that are CXCR4/CCR5 dual chemokine receptor antagonists. (04/01/13 - 03/31/14).

Sharon Lewis

Campus Mentor for the Native American and Pacific Islander Research Program (NAPIRE)
spring Mentor Workshop in Costa Rica. Travelled to Costa Rica as a part of the Mentor team.

Director of the Southern Plains Transportation Center grant in conjunction with the University of Oklahoma.

Susan Walden

Leonard*, S.E., Percy*, B.M, Shehab, R.L., and Walden, S.E. (October, 2013). "Minority Student Informed Retention Strategies," *Proceedings of the 43rd ASEE/IEEE Frontiers in Education Conference* (FIE 2013), Oklahoma City, OK (*are undergraduate students)

Student Competition Team." *Proceedings of the 43rd ASEE/IEEE Frontiers in Education Conference (FIE 2013)*, Oklahoma City, OK.

Awarded the 2013 American Society for Engineering Education William Elgin Wickendem award for the best paper of the 2012 volume year appearing in the *Journal of Engineering Education*. The paper that received the award is: "'Asians are good at math. What an awful stereotype:' The Model Minority Stereotype's Impact on Asian and Asian American Engineering Students," Trytten, D.A., Wong Lowe*, A., and Walden, S.E.; *Journal of Engineering Education*, 2012, Vol. 101 (3), pp. 439-468

Frank White

Presented at the International Conference on Pig Reproduction at Olsztyn, Poland. The title was Chemokine Ligands 9, 10, and 11 during Successful and Endocrine Disrupted Pregnancy in the Porcine Uterus.

Lents C. A., F. J. White, N. H Cicciooli , L. N. Floyd , I. Rubio , D. H. Keisler, L. J. Spicer, and R. P. Wettemann. (2013). Metabolic status, gonadotropin secretion, and ovarian function during acute nutrient restriction of beef heifers. *J. Anim Sci.* 91:4146-4157.

Gregory Wilson

Served as director for Oklahoma Research Day, University of Central Oklahoma campus; attended the National Conference on Undergraduate Research, Lexington, KY.

Chair-elect, At-Large Division, Council on Undergraduate Research (CUR).

Barthell, J F., W. R. Chen, B. K. Endicott, C. A. Hughes, W. J. Radke, C. K. Simmons, and G. M. Wilson. (2013). Encouraging and sustaining a culture of student-centered research at a predominantly undergraduate institution. *CUR Quarterly*, 34:41-47.

Barthell, J., M. Pope, J. King, C. Verschelden, C. Hughes, and G. Wilson. (2014). Using a transformative learning transcript to assess high-impact practices. A Collection of Papers on Quality in Higher Education. *Higher Learning Commission*.

SCHOLAR AND BD FELLOW HIGHLIGHTS

Publications

Scholars and Bridge to the Doctorate Fellows, along with their mentors, submitted articles for publication in peer-reviewed journals. Listed below are the scholars and title of their publications. Selected examples of the articles are listed in Appendix P.

Scholars

OK-LSAMP scholars are among the top students on Alliance campuses and throughout the nation. This year, Oklahoma had Scholars participate in national, state, and local conferences, have articles accepted for publication and numerous other outstanding activities. Additionally, scholars are consistently honored through President and Dean's Honor Rolls, serving as officers and members of student organizations, and recipients of numerous scholarship awards. Listed below are select examples of Scholar highlights.

Tyler Ashley – OU – (1) Interned at Northrup Grumman in El Segundo, California, as a Systems Engineering Intern in the Aerospace Systems communications department

Alfa Abame – SWOSU – (1) one of 196 students from 36 states named as a Newman Civic Fellow by Campus Compact. The award recognizes inspiring college student leaders who have demonstrated an investment in finding solutions for challenges in their community.

Laura Asaro – ECU – (1) interned at the University of California-LA, Los Angeles, CA in the Research in Industrial Projects for Students (RIPS) program at the Institute for Pure and Applied Mathematics (IPAM); (2) 2014 internship project was for Google LA.

Megan Ayala -- SWOSU – (1) presented at Oklahoma Research Day; (2) participated in a summer research experience at Southwestern Oklahoma State University with her mentor.

Zoe Austin – OSU – (1) presented a research poster at the 2014 National Conference on Undergraduate Research, Lexington, KY; (2) presented a research poster at Oklahoma Research Day, Edmond, OK; (3) presented a research poster at the 19th Annual LSAMP Research Conference, Stillwater, OK; (4) participated in the National Student Exchange at California State University at Monterey Bay, CA; (5) presented her research at the Sigma Xi conference, Research Triangle Park, NC; (6) awarded the Wentz Research Scholarship for 2013-2014 for her research on Anole lizards; (7) participated in an REU program at Indiana University.

Lindsey Berger – OSU – (1) member of the Scholars in Science: Native American Path (SSNAP) program; (2) presented a research poster at the 2013 SACNAS conference, San Antonio, TX; (3) served as a judge at the Muldrow Public School, Oklahoma; (4) completed B.S. degree requirements.

Kristina Black – LU – (1) summer internship with the Alaska Sea Life Center, Seward, Alaska; (2) completed B.S. degree requirements in Zoology; (3) applied to graduate programs in Zoology.

Tanner Blair – OU – (1) spent the summer as an Embedded Systems Engineer with National Instruments, Austin, TX.

Deborah Bowman – LU – (1) presented at Oklahoma Research Day, Edmond, OK.

Joseph Brown – OSU – (1) participated in a study abroad program in Japan; (2) President of the 2014 National Pan-Hellenic Council Executive Board; (3) named the 2013 National Pan-Hellenic Council Member of the Year; (4) recipient of the Phi Beta Sigma Fraternity, Inc. Southwestern Region Club 1914 and Distinguished Service Chapter Scholarships; (5) represented OSU NPHC at the 2014 AFLV (Association of Fraternal Leadership Values) Central Leadership Conference/ NBGLC (National Black Greek Leadership Conference), Indianapolis, IN.

Sharonda Carson – UCO – (1) presented a research poster at the 19th Annual OK-LSAMP Research Symposium, Stillwater, OK; (2) presented a research poster at the 2014 Oklahoma Research Day Conference, Edmond, OK; (3) presented her research poster at the 2014 NCUR Conference, Lexington, KY; (4) accepted in the 2013 Native American and Pacific Islanders Research Experience (NAPIRE) program in Costa Rica; (5) accepted for an international summer internship in Turkey and Greece for 2014.

Cord Carter – SE – (1) accepted into the Master of Science in Chemistry program at Jackson State University; (2) received the Bridge to the Doctorate funding.

Ana Chicas-Mosier – OSU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presented at the 19th Annual Research Symposium, Stillwater, OK; (3) presented a “hands-on” demonstration of bee behavior at the Women in Science Conference, Oklahoma City, OK; (4) article accepted for publication; (5) received the OSU WENTZ Research Scholarship; (6) summer 2014 internship with the Colorado Rocky Mountain Biological Lab.

Evann Comeaux – LU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) attended the 2013 Women of Color Conference, Dallas, TX; (3) received a Leadership Award at the 2013 Women of Color Conference; (4) presented a research poster at the 19th Annual Research Symposium, Stillwater, OK.

Andres Guerrero Criado – OSU – (1) chosen for the OSU Department of Housing and Residential Life Capstone Leader-Scholar Award; (2) OSU Department of Housing and Residential Life Leanna Lamb Leader-Scholar Award; (3) chosen as a finalist for the Great Lakes National Scholarship Program; (4) summer internship, University of Washington Medical Center, St. Louis, MO.

Bree Cooper – OU – (1) spent most of the summer in Italy on a Study Abroad Experience; (2) learned to skydive; (3) served as a tutor/mentor on the OU campus.

Kayla Davis – OSU – (1) accepted in the graduate program and accepted a graduate assistantship at Harvard University to continue her graduate studies in Biological Sciences.

Lindsey Davis – LU – (1) presented at Oklahoma Research Day, Edmond, OK.

Dustin Davilla – SWOSU – (1) participated in INBRE Summer Research Internship, Weatherford, OK; (2) nominated for six month study abroad program in France.

Eugene DeLoach – LU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX.

Kelsey Dozier – NSU – (1) accepted for graduate studies at the University of Arkansas.

Athia Edwards – OSU – (1) spent her last semester in a co-op experience in Tulsa Oklahoma at L-3 Communications; (2) accepted full-time employment with L-3 Communications upon graduation; (3) pursuing a MBA degree at Oral Roberts University, Tulsa, OK.

Kristen Enyart – OSU – (1) presented research at the 19th Annual Research Symposium; (2) completed B.S. degree requirements; (3) Accepted in the University of Oklahoma Pharmacy School for Fall 2014.

Brice Fiddler – OSU – (1) completed a study abroad trip to Guatemala for Engineers Without Borders to build more efficient wood burning stoves for communities in need; (2) completed B.S. degree requirements; (3) accepted in to Cohort 7 OSU Bridge to the Doctorate program.

Luis Figueroa – UCO – (1) completed an internship program with the Department of Defense working for the U.S Customs and Border Patrol Laboratories in Houston, TX. The Oak Ridge Associated Universities (ORAU); (2) worked with marijuana to determine geographical origin based on the cannabinoid profile of a given marijuana sample; (3) used SPME (Solid Phase Micro Extraction) to extract the cannabinoids.

Peter George – OU – (1) interned with Enable Midstream Partners, Oklahoma City, OK.

Jessica Gesell – CU – (1) served as a mentor and program facilitator for the Nano-Explorers Summer Academy; (2) served as a mentor and program facilitator for the Aerospace Engineering Summer Academy.; (3) member of Cameron University Chemistry Club; (4) member of the American Chemical Society; (5) inducted into Pi Mu Epsilon (math honor society); (6) inducted into Gamma Sigma Epsilon (chemistry honor society).

Tiffany Glover – LU – (1) presented research at the Beta Kappa Chi meeting in Houston, TX; (2) presented at Oklahoma Research Day, Edmond, OK.

Ben Graham – OSU – accepted into the University of Wisconsin-Madison summer internship program in the Engine Research Center.

Amber German – LU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX.

Jennifer Green – CU – (1) participated in research related to *The Isomerization of Maleic Acid to Fumeric Acid*; (2) inducted into Phi Kappa Phi and served as an officer for the local chapter; (3) accepted into the Chemistry Honor Society; (4) completed B.S. degree requirements, applying to graduate programs.

Alex Hardison – OSU – (1) presented a research poster at the 19th Annual OK-LSAMP Research Symposium; (2) participated in the Scholars in Science: Native American Path (SSNAP) program at OSU; (3) presented a poster at the 2013 Annual SACNAS Conference, San Antonio, TX; (4) served as a peer mentor for the Native Explorers Program through the OSU Center for Health Sciences.

Caleb Hubbard – SWOSU – (1) presented at Oklahoma Research Day, Edmond, OK.

Morgan James – LU – (1) presented research at Oklahoma Research Day, Edmond, OK; (2) accepted to participate in the Native Americans and Pacific Islanders in Research (NAPIRE) summer 2014 program in Costa Rica; (3) accepted to present at the 2014 SACNAS Conference.

Stephen James – OSU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presenter at the 2014 AIChE Spring Meeting and Global Conference on Process Safety, New Orleans, LA; (3) presentation published in conference proceedings.

Danica Johnson – OSU – (1) presented a poster at the 19th Annual OK-LSAMP Research Symposium; (2) presented a poster at OSU Research Week; (3) completed B.S. degree requirements.

Ryan Johnson – LU -- (1) presented at Oklahoma Research Day, Edmond, OK.

Trokon Johnson – TU – (1) presented a poster at the 19th Annual OK-LSAMP Research Symposium; (2) presented at the National Conference on Undergraduate Research, Lexington, KY; (3) participated in a summer REU at Washington State University.

Sara Johnson-Hamilton – OSU – (1) received first place at the American Society of Microbiology (ASM) national conference in Kansas City, KS; (2) received first place in the Biological Sciences undergraduate paper division of the OSU Spring Research Symposium; (3) participant Scholars in Science: Native American Path (SSNAP); (4) presented research at the SACNAS Conference in San Antonio, TX.

Kody Jones – OSU – (1) recognized as a Senior of Significance at OSU; (2) presented his research at the 19th Annual Research Symposium; (3) released his first CD (Appendix Q); (4) offered a job with Chesapeake Oil Company, along with housing and vehicle.

Geoff Kibble – OSU – (1) participated in the Scholars in Science; Native American Path (SSNAP) program at OSU; (2) presented a poster at the national SACNAS conference, San Antonio, TX; (3) presented at Oklahoma Research Day, Edmond, OK; (4) presented at the 19th Annual Oklahoma Research Symposium, Stillwater, OK; (4) presented at the AIAA conference, in Albuquerque, NM; (5) inaugural member of the OSU SACNAS Chapter.

Elizabeth Krause – CU – (1) participated in a two-semester internship with Walt Disney World Company; (2) received numerous local scholarships; (3) Mentor/Internship with Science Detectives Summer Academy, Lawton, OK.

Ashley Lonetree – OSU – (1) completed B.S. degree and presented with an Honor's College degree; (2) participated in the 2013 Native American and Pacific Islanders in Research Summer Program in Costa Rica; (3) presented at Oklahoma Research Day, Edmond, OK.

Amanda Mathias – OSU – (1) participated in the American Society of Animal Sciences (ASAS) Undergraduate Student Poster Competition for the 2013 American Dairy Science Association (ADSA) and ASAS Joint Annual Meeting in Dallas, TX; (2) presented for a third year a research poster at the National Conference on Undergraduate Research in Lexington, KY; (3) participant in the Scholars in Science: Native American Path (SSNAP) program; (4) attended and presented at the National SACNAS conference in San Antonio, TX; (5) presented a poster and oral presentation at the 19th Annual Research Symposium, Stillwater, OK; (6) received third place for her poster presentation at the 19th Annual Research Symposium; (7) presented her research poster at the OSU Animal Science Undergraduate Research Scholars Symposium, Stillwater, OK; (8) Student judge, Cherokee Nation Science Fair, Tahlequah, OK; (8) student judge, Muldrow Science Fair, Muldrow, OK; received the CASNR Senior of Distinction Award; (9) CASNR Dean's Award of Excellence; (10) Animal Science Leadership Award; (11) Honor's College honors added to her B.S. degree; (12) participated in a iREU in Brazil; (13) accepted into the Ph.D. program at Louisiana State University; (14) received the NSF Bridge to the Doctorate Fellowship at LSU (Appendix Q).

Marissa Mercado – OU – (1) Interned with Chevron in Bakersfield, CA as a Compliance Engineering Intern; (2) completing requirements for a 5-year accelerated BS/MS program in Petroleum Engineering.

Marissa Merrifield – CU – (1) presented at Oklahoma Research Day, Edmond, OK.

Njemile Miro – LU – (1) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX.

Gretchen Moore – OSU – (1) presented at the 19th Annual Research Symposium; (2) judge, Muldrow Science Fair. (3) received the 2014 WENTZ Research Scholarship.

Juan Orozco – UCO – (1) presented two posters at Oklahoma Research Day, Edmond, OK.

Cameron Patterson – OSU – (1) awarded membership into Phi Kappa Phi Honor Society; (2) received Honorable Mention for the 2nd year Studio Book Award, which is awarded to the top performers in the Architectural Design Studio; (3) received the Henry R. Ball Scholarship and the Joseph Reeves Memorial Scholarship in Architecture.

Mary Ann Phillips – SWOSU – (1) game reviewer at *Altered Confusion*; (2) Everett Dobson Scholarship recipient; (3) SWOSU Computer Club president 2013-2014; (4) received a second year invitation to return to Clemson University for a 2014 internship; (5) Clemson University, Clemson, South Carolina, 2013 summer internship; (6) participant in the OU NASA Space Grant Geospatial Symposium, OU Norman; (7) presented at the 19th Annual Research Symposium, Stillwater, OK; (8) presented at Oklahoma Research Day, Edmond, OK; (9) presented at SWOSU's Scholarly Activity Fair; (10) received a scholarship to attend the ACM-W Super Computing

Conference, Denver, CO; (11) received a Google scholarship to attend the Tapia Conference, Seattle, WA; (12) received 2nd place I Microsoft's Code-A-Thon at the Tapia Conference, Seattle, WA; (13) received a NASA Robotics grant; (14) numerous honors and awards.

Keelyn Pollard – LU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX; (3) received third place in Biology oral presentation at Beta Kappa Chi meeting.

Allison Potts – OSU – (1) presented a research poster at the 19th Annual Research Symposium, Stillwater, OK; (2) received first place for her poster at the 19th Annual Research Symposium; (3) participated in the Scholars in Science: Native American Path (SSNAP) program for the second year; (4) presented a research poster at the national SACNAS conference in San Antonio, TX; (5) presented her research poster at the OSU Animal Science Undergraduate Research Scholars Symposium, Stillwater, OK; (6) received the OSU Wentz Research Award for 2014; (7) accepted into the Bridge to the Doctorate program at Oklahoma State University to study Forensics.

Denzel Pugh – LU – (1) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX; (2) presented at Oklahoma Research Day, Edmond, OK.

Jenna Redd – UCO – (1) presented two posters at Oklahoma Research Day, Edmond, OK.

Keely Redhage – OSU – (1) accepted for a summer iREU in Lille, France through Louisiana State University (Appendix Q); (2) presented research at the 19th Annual Research Symposium, Stillwater, OK; (3) participated in the Scholars in Science: Native American Path (SSNAP) program for the second year; (4) inaugural member of the OSU SACNAS Chapter; (5) presented research at the National SACNAS conference, San Antonio, TX; (6) received the OSU Wentz Research Award for 2014; (7) participant in the 2013 University of Wisconsin, REU in Microbiology (Appendix Q); (8) accepted for graduate studies at Mayo Graduate School.

Zachery Rich – OSU – (1) presented research at the regional American Chemical Society meeting, Stillwater, OK.

Katy Riojas – TU – (1) participated in an REU at the University of Pittsburgh in Human Engineering Technologies; (2) presented her summer research via poster and oral presentation to faculty.

Ashley Rodriguez – SWOSU – (1) had an article accepted for publication: "*Analysis of Differential Gene Expression Profiles in C. elegans Knockouts for the v-SNARE Master Protein I*" *Journal of Neuroscience Research* (February, 2014) (Appendix P).

Adrian Saenz – OSU – (1) internship at the Colorado School of Mines under the ReNUWt program; (2) officer of the Hispanic Student Association; (3) presented research at the 19th Annual Research Symposium.

Rajah Singh – LU – (1) presented research at the 2014 Beta Kappa Chi meeting in Houston, TX.

Isaac Smith – OSU – (1) completed a summer internship at McElroy Manufacturing, Tulsa, OK; (2) presented summer research experience and projects to four levels of management and the CEO of six different companies

Chelsea Spencer – UCO – (1) article accepted for publication in *Cell Biology International* (Appendix P).

Jason Semien – OSU – (1) received an Honor's College degree from OSU.

William Snow – UCO – (1) attended the ASME Conference in San Diego, CA and presented his research; (2) research paper printed in the conference proceedings journal; (3) presented research poster at Oklahoma Research Day, Edmond, OK.

Andrea Talley – OSU – (1) admitted to Parker University School of Chiropractic in Texas to complete B.S. degree and continue toward graduate degree in chiropractic medicine.

Linzi Thompson – ECU -- (1) presented a research poster at the 19th Annual Research Symposium, Stillwater, OK; (2) presented a research poster at Oklahoma Research Day, Edmond, OK; (3) accepted for an iREU in Nanjing, China; (4) conducted independent research in Cambodia with the Society for Environmental Exploration (Appendix Q); (5) presented individual research at Alpha Chi National Honor Society National Convention, St. Louis, MO; (6) one of five teams nationwide to complete and present research on groundwater at the Alpha Chi National Honor Society National Convention, St. Louis, MO. The team consisted of five students from five different departments at ECU, including political science, psychology, cartography, environmental health, and chemistry; (7) selected to represent ECU for research presentation at the Oklahoma Research Day at the Capitol (only one student from each college/university is chosen to attend).

Sherri Toal – OSU – (1) presented at Oklahoma Research Day, Edmond, OK; (2) presented at the Annual Research Symposium; (3) completed B.S. degree requirements; (4) accepted into the graduate program at the Center for Health Sciences, Oklahoma State University, Tulsa, OK.

Brittany Vann – LU – (1) presented at Oklahoma Research Day, Edmond, OK

Jessica Webb – UCO – presented at Oklahoma Research Day, Edmond, OK.

Ashlie Walker – SWOSU – (1) attended the Women of Color Conference, Dallas, TX; (2) presented her research at the 19th Annual Research Symposium, Stillwater, OK; (3) presented research at Oklahoma Research Day, Edmond, OK; (4) presented research at American Chemical Society Conference, Dallas, TX; (5) accepted for an iREU in Grenoble, France through Louisiana State University (Appendix Q).

Hannah White – OSU – accepted into the Native Americans and Pacific Islanders in Research Experience (NAPIRE) program in Costa Rica for summer 2014. She conducted research on ants in three different locations at the LaSalva Biological Research Station.

Jadith M. Ziegler – CU – (1) completed requirements for the B.S. degree in Biology; (2) accepted into graduate program at OSU and OU; (3) article being reviewed for publication; (4) awarded the Bridge to the Doctorate from the University of Oklahoma.

BD Fellows

The Oklahoma Bridge to the Doctorate program has received funding for seven programs, with Cohort I and II completed. Cohort III was awarded to Oklahoma State University in August 2008, for two years of NSF funding. Cohort IV, University of Oklahoma, was awarded in April 2009, to begin August 2009. Cohort V, Oklahoma State University, was awarded in October 2011 with fellow support beginning January 2012. Cohort VI was awarded to the University of Oklahoma; Cohort VII was awarded to Oklahoma State University. Both cohorts began funding participants in Fall 2013. Appendix R highlights Fellows from the University of Oklahoma and Oklahoma State University.

Cohort I and II

Cohorts I and II Bridge to the Doctorate Fellows at both OSU and OU have been successful in completing a total of 15 Master of Science degrees and 7 Doctor of Philosophy degrees. Additionally, four fellows expect to complete Doctor of Philosophy degrees in the near future. Four fellows either transferred to another institution or left the program. Dr. Brek Wilkins, was successful in developing and refining software that will predict the onset of a heart attack within minutes. His discovery has resulted in a \$3.5 million dollar grant from Tandy Corporation. Cara Cowan, serves as a Cherokee Nation Tribal Councilwoman. Her position allows her to travel to promote LSAMP and encourage Native American students to attend college and major in STEM disciplines.

Cohort III

Cohort III, awarded to Oklahoma State University, recruited 12 Fellows for entry into graduate programs. Eight began in the fall 2008 term and four began in the Spring 2009 term. One additional Fellow was added in May 2011 to fulfill grant funds left by Fellows who completed MS degrees and left the program. To date, one Fellow left the program without completing a graduate degree; ten (10) received MS degrees, and five continue to work toward completion of the Ph.D. degree.

Tomica Blocker – (1) Continued to meet PhD requirements and finish research project at OSU; (2) continued to take course work at the University of Kansas Medical School for a MD degree.

Scott Fine – (1) Continued to meet Ph.D. degree requirements, with anticipated completion of December 2014.

Jonathan Gonzales – (1) Continuing with Ph.D. degree requirements; (2) teaching assistant for ECEN 3314 (Electronic Devices), OSU undergraduate engineering program; (3) Principal Investigator to an NSF grant for Small Business Innovation Research (SBIR).

Cody Pinkerman – (1) Continuing with Ph.D. degree requirements; (2) teaching assistant for aerospace engineering undergraduate programs.

Zach Carpenter – (1) Continuing to work toward Ph.D. completion; (2) continued employment as a Research Engineer at OSU-Tulsa in the Helmerich Advanced Technology Research Center.

Cohort IV

The University of Oklahoma was awarded a Bridge to the Doctorate (Cohort IV) program to begin in the fall 2009 semester. Below are selected highlights.

Brittanie Atkinson – (1) completed Master of Science degree; (2) Education Coordinator, Integrated Network College (LINC) for STEM, Langston University.

Zachary Dunn – (1) selected to participate in the National Society for the Advancement of Chicanos and Native Americans (SACNAS) National Conference in Seattle, WA; (2) continuing with graduate requirements.

Mario Franklin – (1) continuing with Master of Science degree program; (2) accepted employment as an Industrial Engineer with Tinker Air Force Base, OK.

Juan Herrera – (1) completed the Master of Science degree; (2) accepted employment in Clearwater, Florida, with Honeywell Aerospace Center as an Electrical Hardware Design Engineer.

Lorne Jordan – completed M.S. graduate degree requirements and transferred to KSU for a Ph.D. program in Biochemistry and Molecular Biophysics; (2) had one article published: Jordan, L.D., Y. Zhou, C.R. Smallwood, Y. Lill, K. Ritchie, W.T. Yip, S.M. Newton, P.E. Klebba, “Energy-dependent motion of TonB in the Gram-negative bacterial inner membrane.” PNAS, 06/2013 (Appendix P); (3) president of the Biochemistry & Molecular Biophysics Graduate School Association, KSU.

Jason Kimmel – continuing with Ph.D. degree requirements.

L. Meghan Liles – continued with Ph.D. graduate degree requirements.

Shawna Ong – (1) completed the Master of Science degree; (2) accepted employment as an Engineer with Raytheon in McKinney, Texas.

Ryan Watley – (1) continuing with Ph.D. graduate degree requirements.

Cohort V

Cohort V was awarded through the National Science Foundation as grant number HRD-1139824 for a two year period. Six Fellows were selected to begin graduate studies Spring 2012, two began Summer 2012, and four began in the Fall 2012 semester.

RaiAnna Paula Arscott – (1) continuing with Ph.D. program requirements; (2) completed BD Fellowship funding; (3) teaching assistant for undergraduate chemistry courses.

Nicole Bryant – (1) continuing with Ph.D. program requirements; (2) presented research at the International Arabidopsis Conference in Sydney, Australia; (3) completed BD Fellowship funding.

Eric Butson – (1) participated in the Scholars in Science: Native American Path (SSNAP) program sponsored by the Society for the Advancement of Chicanos and Native American Students in Science; (2) presented a research project at the American Chemical Society National Conference, Dallas, TX; (3) continuing with Ph.D. program requirements.

Jamere King – (1) attended the National Society of Black Engineers (NSBE) National Convention, Nashville, TN; (2) completed M.S. degree program in May 2014; (3) accepted employment with Exxon Oil Company in Houston, TX.

Darron “DJ” Lamkin – (1) continued with Ph.D. program requirements; (2) accepted part-time employment with Oklahoma City Public Schools as a STEM Mentor.

Josh McLoud – (1) continued M.S. degree program, estimated completion December 2014; (2) continuing with Ph.D. program requirements at the University of Tulsa; (3) transferred with his GRFP award to the University of Tulsa.

Molly Parkhurst – (1) completed M.S. degree program in December 2013; (2) accepted a full-time position in industry.

Marissa Rice – (1) transferred to Cornell University and continues to pursue Ph.D.

Joseph Ross – (1) continuing with M.S. program requirements; (2) member of the OSU Society for the Advancement of Chicanos and Native Americans in Sciences (SACNAS) chapter.

David Supeck – (1) participated in the Scholars in Science: Native American Path (SSNAP) program sponsored by the Society for the Advancement of Chicanos and Native American Students in Science; (2) attended the National SACNAS conference in San Antonio, TX (4) campaigned for a National SACNAS student office; (5) serves as OSU Student Liaison for the national SACNAS program; (6) participated in a 2013 summer NIH internship, Washington, D.C.; (7) continuing with Ph.D. program requirements.

Ana Tehrani – (1) completed M.S. degree program in June 2014, (2) transferred to a non-stem Ph.D. program.

Charles “CJ” Williams, Jr. – (1) attended the National Society of Black Engineers (NSBE), Nashville, TN; (2) completed M.S. degree program in May 2014, (3) accepted employment in industry.

Cohort VI

The University of Oklahoma received funding for Cohort VI Bridge to the Doctorate. Fellows in the program include:

Christina Bruxvoot – Continuing with M.S. degree requirements in Biochemistry.

Daniel Dixon – Continuing with Ph.D. degree requirements in Chemical Engineering.

Robert Donatto – Continuing with M.S. degree requirements in Electrical and Computer Engineering.

Jared Giem – Continuing with M.S. degree requirements in Radiological Sciences.

Josh Hardisty – Continuing with M.S. degree requirements in Geophysics.

Kayla Love – Continuing with M.S. degree requirements in Biochemistry.

Alex Moreno – Continuing with M.S. degree requirements in Electrical Engineering.

Abigail Ntrel – (1) Completed a M.S. degree requirements in Biochemistry, May 2014, (2) continuing with Ph.D. requirements in Biochemistry.

Allison Quiroga – (1) Completed M.S. degree requirements in Civil Engineering, May 2014, (2) continuing with Ph.D. requirements in Civil Engineering.

Cortes Williams – Continuing with M.S. degree requirements in Bio-Engineering.

Sergio Zegarra – Will begin with M.S. degree requirements in Mechanical Engineering in Fall 2014.

Jadith Ziegler – Will begin with M.S. degree requirements in Microbiology in Fall 2014.
Cohort VII

Oklahoma State University received funding for Cohort VII Bridge to the Doctorate. Fellows in the program include

Blair Baldrige – (1) begin his Fellowship in fall 2013 for a Master of Science in Electrical and Computer Engineering.

Brandon Burgess – (1) began his Fellowship in the fall 2013 for the Master of Science in Plant and Soil Sciences.

Gregory Cook – (1) began his Fellowship in the fall 2013 for the Ph.D. in Biomedical Sciences with an emphasis in immunology.

Joseph Dyer – (1) began his Fellowship in fall 2013; (2) completed requirements for the Master of Science degree in Fish and Wildlife Management - National Resources in May 2014; (3) continuing with Ph.D. program requirements.

Jessica Sunny Evans – (1) began her Fellowship in fall 2013 with a Master of Science in Entomology; (2) presented at the 62nd Annual Southwestern Branch meeting for the Entomological Society of America (ESA), San Antonio, TX; (3) co-organized a symposium entitled, "Biological Control of Saltcedar: Range Expansion and Future Research Priorities in the Southwestern US;" (4) member of the OSU Linnaean Team at the 62nd ESA meeting, team received first place in the trivia competition and will advance to compete at the national ESA meeting in Portland, OR.

Brice Fiddler – (1) begin his fellowship in fall 2014 for a Master of Science in Civil Engineering.

Shelby Fraser – (1) began her Fellowship in spring 2014 for a Master of Science in Natural Resources; (2) participated in 5K events with OSU track team; (3) received a grant for \$45,000 to put GPS tracking collars on coyotes in the Tallgrass Prairie Reserve in Oklahoma.

Jeremy Hall – (1) began his Fellowship in fall 2013 for a Master of Science in Electrical and Computer Engineering; (2) attended the National Society of Black Engineers (NSBE), Nashville, TN.

Jorge Lightfoot – (1) begin his Fellowship in summer 2014 in the Microbiology Ph.D. program; (2) attended the regional meeting of the American Society of Microbiologists, Kansas City, KS; (3) elected as Vice President in the OSU SACNAS Chapter; (4) member of the Scholars in Science: Native American Path (SSNAP) program.

Milecia Matthews – (1) begin her Fellowship in summer 2014 for a Master of Science in Aerospace Engineering; (2) traveled to Brazil on a summer 2014 Study Abroad Experience.

Allison Potts – (1) begin her Fellowship in summer 2014 for a Master of Science in Forensics; (2) participated in the Scholars in Science: Native American Path (SSNAP) program for the second year; (3) presented research at the 2013 SACNAS conference, San Antonio, TX; (4) inaugural member of the OSU SACNAS Chapter.

Liz Zehren – (1) began her Fellowship in fall 2013 in the Master of Science in Physics program; (2) participated in the Scholars in Science: Native American Path (SSNAP) program; (3) attended the 2013 SACNAS conference in San Antonio, TX; (4) inaugural member of the OSU SACNAS Chapter.

STAFF TRAINING AND DEVELOPMENT

OK-LSAMP support staff is an integral part of the program. Project staff continually seek professional opportunities. Highlights include, but are not limited to:

Susy Calonkey, OK-LSAMP Program and Bridge to the Doctorate Staff Coordinator, the University of Oklahoma: (1) member, American Society of Engineering Education (ASEE); (2) served as recruiter and outreach coordinator for the College of Engineering; (3) Dean's Leadership Council Staff Advisor; (4) coordinated Dean's Leadership Council Retreat; (5) E-1 First Year Engineering Student Club, staff adviser; (6) Engineering Leadership Roundtable Staff Advisor; (7) Delegate to World Creativity Forum; (8) Member, Women's Philanthropy Network, University of Oklahoma; (9) Board Member, Norman Community Foundation; (10) Advisory Board Member, ASTEC Charter School.

Kay Porter, Program Manager, Oklahoma State University: (1) Co-Director for Scholars in Science: Native American Path (SSNAP); (2) State Coordinator for Women of Color STEM Conference; (3) presenter for Women of Color STEM Conference, Dallas, Texas; (4) served on the planning committee for the Oklahoma EPSCoR Women in Science Conference for junior and high school girls; (5) member, Oklahoma State University Native American Faculty and Staff Association; (6) council member, OSU Alumni Council and Alumni Leadership Council, representing the American Indian Alumni Association; (7) attended the 2013 NSF Louis Stokes Midwest Center for Excellence (LSMCE) conference, Indianapolis, IN; (8) participant, 2014 NAPIRE Mentor Workshop, Costa Rica; (9) judge for the 2014 FCCLA state competition, Stillwater, Oklahoma; (10) attended Oklahoma Research Day, Edmond, Oklahoma; (11) judge, Muldrow Schools Science Fair; (12) mentor, OSU National Lab Day; (13) inducted into the OSU Chapter of Mortar Board.

Fara Williams, Grant Coordinator, Oklahoma State University: (1) attended Women of Color STEM Conference, Dallas, Texas; (2) volunteer during the Women in Science Conference; (3) presenter/volunteer counselor for Cherokee College Preparatory Institute (CCPI), 2nd and 3rd annual college week-long, college readiness activity sponsored by the Cherokee Nation Foundation for Cherokee Nation junior and senior high school students, June 2013;

(4) facilitator, Oklahoma Project WILD and Growing Up WILD, Pre K-12 outdoor curriculum; (5) judge for the 2014 FCCLA state competition, Stillwater, Oklahoma; (6) judge for the 2014 Cherokee Nation Science and Engineering Fair; (7) attended the National Conference on Undergraduate Research, Lexington, KY; (8) attended Oklahoma Research Day, Edmond, Oklahoma; (9) participated as mentor for the Scholars in Science: Native American Path (SSNAP) program sponsored by the Society for the Advancement of Chicanos and Native Americans in Science; (10) attended the 2013 national SACNAS Conference, San Antonio, TX; (11) judge, Muldrow Schools Science Fair; and (12) mentor, OSU National Lab Day.

EVALUATION PROCEDURES

Ms. Sandra Whalen, Interim Director for the Center for Institutional Data Exchange and Analysis, located on the University of Oklahoma campus, Norman, Oklahoma served as the OK-LSAMP outside evaluator for the Oklahoma Louis Stokes Alliance for Minority Participation program. A report is located in APPENDIX S.

APPENDIXES

APPENDIX A

DIVERSITY AWARD

INSIGHT

Into Diversity

Higher Education

**Excellence
& Diversity**

Award

2013

Second year for OSU to receive the award.

APPENDIX B

OSRHE SUMMER ACADEMIES

APPENDIX C

FORMER SCHOLAR HIGHLIGHTS

BRANDON “BUBBA” BROOKS

Microbes in the neonatal intensive care unit resemble those found in the gut of premature infants

Brandon Brooks¹, Brian A Firek², Christopher S Miller¹³, Itai Sharon¹, Brian C Thomas¹, Robyn Baker⁴, Michael J Morowitz² and Jillian F Banfield^{1*}

- * Corresponding author: Jillian F Banfield jbanfield@berkeley.edu

Microbiome 2014, 2:1 doi:10.1186/2049-2618-2-1

Published: 28 January 2014

Abstract

Background

The source inoculum of gastrointestinal tract (GIT) microbes is largely influenced by delivery mode in full-term infants, but these influences may be decoupled in very low birth weight (VLBW, <1,500 g) neonates via conventional broad-spectrum antibiotic treatment. We hypothesize the built environment (BE), specifically room surfaces frequently touched by humans, is a predominant source of colonizing microbes in the gut of premature VLBW infants. Here, we present the first matched fecal-BE time series analysis of two preterm VLBW neonates housed in a neonatal intensive care unit (NICU) over the first month of life.

Results

Fresh fecal samples were collected every 3 days and metagenomes sequenced on an Illumina HiSeq2000 device. For each fecal sample, approximately 33 swabs were collected from each NICU room from 6 specified areas: sink, feeding and intubation tubing, hands of healthcare providers and parents, general surfaces, and nurse station electronics (keyboard, mouse, and cell phone). Swabs were processed using a recently developed ‘expectation maximization iterative reconstruction of genes from the environment’ (EMIRGE) amplicon pipeline in which full-length 16S rRNA amplicons were sheared and sequenced using an Illumina platform, and short reads reassembled into full-length genes. Over 24,000 full-length 16S rRNA sequences were produced, generating an average of approximately 12,000 operational taxonomic units (OTUs) (clustered at 97% nucleotide identity) per room-infant pair. Dominant gut taxa, including *Staphylococcus epidermidis*, *Klebsiella pneumoniae*, *Bacteroides fragilis*, and *Escherichia coli*, were widely distributed throughout the room environment with many gut colonizers detected in more than half of samples. Reconstructed genomes from infant gut colonizers revealed a suite of genes that confer resistance to antibiotics (for example, tetracycline, fluoroquinolone, and aminoglycoside) and sterilizing agents, which likely offer a competitive advantage in the NICU environment.

Conclusions

We have developed a high-throughput culture-independent approach that integrates room surveys based on full-length 16S rRNA gene sequences with metagenomic analysis of fecal samples collected from infants in the room. The approach enabled identification of discrete ICU reservoirs of microbes that also colonized the infant gut and provided evidence for the presence of certain organisms in the room prior to their detection in the gut.

FELECIA EKPO



Felicia Ekpo, MS-II, takes a break from studying to look at the visiting exhibit about African-Americans in Civil War medicine.



Feb. 21, 2013

Civil War medicine exhibit on display at OSU-CHS

The Oklahoma State University Center for Health Sciences Medical Library is hosting the National Library of Medicine's traveling exhibit, *Binding Wounds, Pushing Boundaries: African-Americans in Civil War Medicine* in Founders Hall through March 20.

The travelling exhibit recognizes the contribution of African-Americans as nurses, surgeons and hospital workers during the American Civil War. Many histories have been written about medical care during this war, but the participation and contributions of African-Americans have often been overlooked.

"The exhibit highlights the experiences of men and women whose efforts to provide medical care to soldiers and civilians are not well-known," said Melissa Kash-Holley, reference and instruction services librarian at the OSU-CHS. "As healers and caretakers, the individuals highlighted in this exhibit pushed past the bounds of race and gender and left an indelible mark on American history."

The exhibit opens the door to this rarely studied part of history and brings a voice to those that have remained silent for nearly 150 years. Through historical images and period documents, the exhibit displays the work of African-Americans as medical providers and how they challenged the prescribed notions of race and gender.

This exhibition was developed and produced by the National Library of Medicine with research assistance from The Historical Society of Washington, D.C. To learn more, visit www.nlm.nih.gov/exhibition/bindingwounds/index.html

ScienceDaily

Your source for the latest research news

Biochemical role of crucial TonB protein in bacterial iron transport and pathogenesis

Date: July 1, 2013

Source: Kansas State University

A Kansas State University led study has discovered the role of a protein in bacteria that cause a wide variety of diseases, including typhoid fever, plague, meningitis and dysentery. The results may lead to new and improved antibiotics for humans and animals.

Phillip E. Klebba, professor and head of the department of biochemistry and molecular biophysics, made the findings with two colleagues in the department: Lorne D. Jordan, doctoral candidate, Manhattan, and Saleté M. Newton, research professor. The collaboration included other biophysicists at the University of Oklahoma and Purdue University. Their study, "Energy-dependent motion of TonB in the Gram-negative bacterial inner membrane," appears in the journal *Proceedings of the National Academy of Sciences*, or PNAS.

The research focuses on the central role of iron in biochemistry. Both animals and bacteria require iron for biological processes like energy generation and DNA, Klebba said. The iron acquisition systems of bacteria, however, contribute to infectious diseases.

"Iron is the object of a microbiological war in the human body," Klebba said. "Host proteins defend cells and tissues by sequestering the metal, and successful pathogens overcome this barrier and capture the iron. But the iron transport mechanisms of pathogenic organisms are not well understood."

The membrane protein TonB plays an indispensable role in the uptake of iron by Gram-negative bacteria – a classification of bacteria that is more resistant to antibiotics because of a nearly impenetrable cell wall. Gram-negative bacteria can cause diseases such as Escherichia coli, Salmonella typhi, Yersinia pestis, Vibrio cholera, Brucella abortus. Neisseria meningitidis cause many diseases and clinical conditions, they all transport iron by the same mechanism that depends on the actions of TonB.

Despite decades of research, the biochemical role of TonB in Gram-negative bacteria was a scientific mystery, Klebba said. He and his colleagues found that the cellular electrochemical forces put TonB in a spinning motion that provides the energy and physical mechanism to enable iron uptake into the cell.

"In this sense TonB acts like an electric motor that constantly rotates in response to the cellular energy flow," Klebba said. "TonB is one of nature's smallest and oldest electrical devices."

According to Klebba, future antibiotics may block the functions of TonB, prevent iron acquisition by Gram-negative cells, and consequently protect humans and animals from infection by such pathogen strains of bacteria.

Besides the PNAS study, Klebba recently shared the findings at the 2013 Gordon Conference on Mechanisms of Membrane Transport in South Hadley, Mass.

Story Source:

The above story is based on materials provided by Kansas State University. Note: Materials may be edited for content and length.

Journal Reference:

1. L. D. Jordan, Y. Zhou, C. R. Smallwood, Y. Lill, K. Ritchie, W. T. Yip, S. M. Newton, P. E. Klebba. Energy-dependent motion of TonB in the Gram-negative bacterial inner membrane. *Proceedings of the National Academy of Sciences*, 2013, DOI: [10.1073/pnas.1304243110](https://doi.org/10.1073/pnas.1304243110)

Cite This Page:

MLA APA Chicago

Kansas State University. "Biochemical role of crucial TonB protein in bacterial iron transport and pathogenesis." ScienceDaily. ScienceDaily, 1 July 2013. <www.sciencedaily.com/releases/2013/07/130701100556.htm>.

AARON RILEY

Absorbed Dose Rate-To-Water at the Surface of a Beta-Emitting Planar Ophthalmic Applicator with a Planar, Windowless Extrapolation Chamber

A Riley^{1*}, C Soares², J Micka³, W Culberson⁴, L DeWerd⁵, (1)University of Wisconsin Medical Radiation Research Center, Madison, WI, (2) NIST (Retired), Gaithersburg, MD, (3) University of Wisconsin Medical Radiation Research Center, Madison, WI, (4) University of Wisconsin Medical Radiation Research Center, Madison, WI, (5) University of WI-Madison/ADCL, Madison, WI

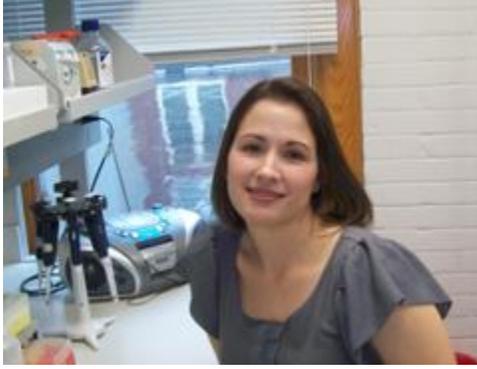
Purpose: Currently there is no primary calibration standard for determining the absorbed dose rate-to-water at the surface of β -emitting concave ophthalmic applicators and plaques. Machining tolerances involved in the design of concave window extrapolation chambers are a limiting factor for development of such a standard. Use of a windowless extrapolation chamber avoids these window-machining tolerance issues. As a windowless extrapolation chamber has never been attempted, this work focuses on proof of principle measurements with a planar, windowless extrapolation chamber to verify the accuracy in comparison to initial calibration, which could be extended to the design of a hemispherical, windowless extrapolation chamber.

Methods: The window of an extrapolation chamber defines the electrical field, aids in aligning the source parallel to the collector-guard assembly, and decreases the backscatter due to attenuation of lower electron energy. To create a uniform and parallel electric field in this research, the source was made common to the collector-guard assembly. A precise positioning protocol was designed to enhance the parallelism of the source and collector-guard assembly. Additionally, MCNP5 was used to determine a backscatter correction factor to apply to the calibration. With these issues addressed, the absorbed dose rate-to-water of a Tracerlab 90Sr planar ophthalmic applicator was determined using National Institute of Standards and Technology's (NIST) calibration formalism, and the results of five trials with this source were compared to measurements at NIST with a traditional extrapolation chamber.

Results: The absorbed dose rate-to-water of the planar applicator was determined to be 0.473 Gy/s \pm 0.6%. Comparing these results to NIST's determination of 0.474 Gy/s yields a -0.6% difference.

Conclusion: The feasibility of a planar, windowless extrapolation chamber has been demonstrated. A similar principle will be applied to developing a primary calibration standard for concave applicators and plaques.

Funding Support, Disclosures, and Conflict of Interest: This research is funded by the customers of the University of Wisconsin Accredited Dosimetry Calibration Laboratory.



Sabrina Scroggins

B.S., Biology, East Central University

Date left program: 9/30/2013

Degree received: Ph.D.

Date Ph.D. awarded: December, 2013

Advisor: Annette Schlueter, M.D./Ph.D.

Dendritic Cells, Aging, and Graft-versus-host Disease

Host dendritic cells (DC) are known to initiate graft-versus-host disease (GVHD) in response to an allogeneic bone marrow transplant. Older patients experience increased incidence and severity of GVHD, and this finding can be reproduced in a mouse model. Through the use of such a murine model of GVHD, I aim to characterize alterations in older host DC that render older mice more susceptible to severe GVHD. This aim will first be addressed through the analysis of co-stimulatory and inhibitory molecule expression, as well as cytokine production.

Prophylactic treatment with host derived regulatory DC (DCreg) has been shown to reduce the severity of GVHD following complete MHC mismatched transplants in both young and older mice. Over 90% of young mice survive GVHD when treated with DCreg (compared to 100% mortality when untreated); older mice also respond to this treatment, although with somewhat lower efficacy depending on the strain combination. I am investigating the mechanisms of GVHD induction and long-term maintenance of a disease free state following DCreg treatment to understand the relative role of Treg, in addition to, host and donor-derived DC in this process. In addition, I aim to develop a murine model of GVHD that facilitates induction of less severe disease that more closely mimics the majority of human patients with GVHD and allows for therapeutic intervention with DCreg.

SABRINA SCROGGINS

Vasopressin in Preeclampsia

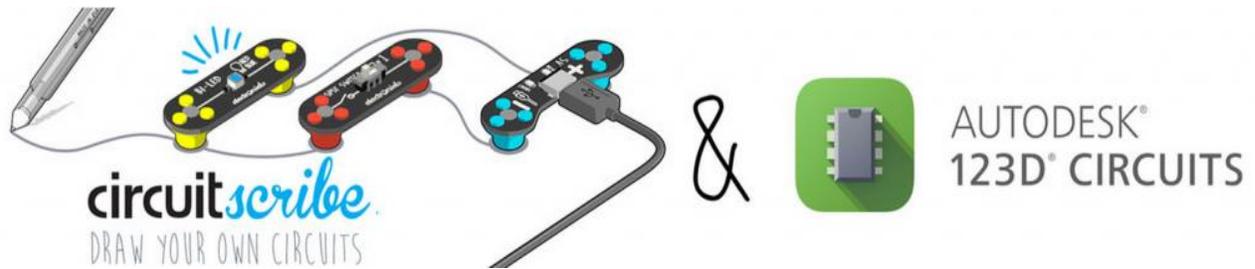
A Novel Very Early Human Pregnancy Biomarker and Clinically Relevant Mouse Model

1. Mark K. Santillan, Donna A. Santillan, Sabrina M. Scroggins, James Y. Min, Jeremy A. Sandgren, Nicole A. Pearson, Kimberly K. Leslie, Stephen K. Hunter, Gideon K.D. Zamba,
2. Katherine N. Gibson-Corley, Justin L. Grobe

Abstract

Preeclampsia, a cardiovascular disorder of late pregnancy, is characterized as a low-renin hypertensive state relative to normotensive pregnancy. Because other nonpregnant low-renin hypertensive disorders often exhibit and are occasionally dependent on elevated arginine vasopressin (AVP) secretion, we hypothesized a possible use for plasma AVP measurements in the prediction of preeclampsia. Copeptin is an inert prosegment of AVP that is secreted in a 1:1 molar ratio and exhibits a substantially longer biological half-life compared with AVP, rendering it a clinically useful biomarker of AVP secretion. Copeptin was measured throughout pregnancy in maternal plasma from preeclamptic and control women. Maternal plasma copeptin was significantly higher throughout preeclamptic pregnancies versus control pregnancies. While controlling for clinically significant confounders (age, body mass index, chronic essential hypertension, twin gestation, diabetes mellitus, and history of preeclampsia) using multivariate regression, the association of higher copeptin concentration and the development of preeclampsia remained significant. Receiver operating characteristic analyses reveal that as early as the sixth week of gestation, elevated maternal plasma copeptin concentration is a highly significant predictor of preeclampsia throughout pregnancy. Finally, chronic infusion of AVP during pregnancy (24 ng per hour) is sufficient to phenocopy preeclampsia in C57BL/6J mice, causing pregnancy-specific hypertension, renal glomerular endotheliosis, proteinuria, and intrauterine growth restriction. These data implicate AVP release as a novel predictive biomarker for preeclampsia very early in pregnancy, identify chronic AVP infusion as a novel and clinically relevant model of preeclampsia in mice, and are consistent with a potential causative role for AVP in preeclampsia in humans.

BRETT WALKER



Electroninks & Autodesk Join Forces

Circuit Scribe Kickstarter backers now have the ability to manage their pledge, and anyone can browse and purchase complete Kits or individual Pens and Modules from the 123D Circuit store. By [setting up a free account](#), you'll also be able to keep track of the Modules you already own. To learn more about Circuit Scribe, [click here](#).

"With our Circuit Scribe conductive pens and circuit modules, we're introducing a new era of electronics prototyping and learning that is affordable, accessible, and fun. Through our partnership with Autodesk, we will open the doors even wider by providing a platform for circuit simulation to the education and maker communities," said Analisa Russo, lead developer of the Electroninks Circuit Scribe. "We hope that our new marketplace and online tools will inspire creativity among makers of all ages and skill levels."

Spoiler Alert!

As a natural extension of our partnership with Electroninks, Kickstarter backers will soon be able to join the 123D Circuits community with the upcoming release of the Circuit Scribe Virtual Editor, exclusively created by the 123D Circuits team to emulate Circuit Scribe Pens and Modules. This editor will allow you to design, simulate, print out, and draw over your circuit. Here's a sneak peek! And let us know if [you'd like to be notified via email](#) when it launches...

"Circuit Scribe is a truly a revolutionary tool to electrify circuit drawings and we're thrilled to partner with Electroninks to provide students and makers with a fun way to learn about electricity and circuits, while adding a new dimension to their creations," said Benjamin Schrauwen, product line manager and architect of 123D Circuits. "This is also a great extension to our 123D Circuits users in combining a virtual simulation platform for conductive ink with the actual hardware."

[April 15, 2013]

UI researcher starting silver-inks firm in C-U [The News-Gazette, Champaign-Urbana, Ill.]

(News-Gazette (Champaign-Urbana, IL) Via Acquire Media NewsEdge) April 15--URBANA _ Brett Walker seemingly can't stop creating stuff.

The 27-year-old doctoral student at the University of Illinois started a gun-parts business in high school. He turned his attention to fuels in college, converting waste grease into biodiesel and "slop oil" into pipeline-grade oil. Now, completing his doctoral degree, he's launching a business around reactive silver inks _ used in printed electronics.

"I'm a tinkerer," Walker said. "I can't sit still. I like creating new things and exploring problems I want to explore." Last year, his work to develop a cheaper, easier-to-make ink than those already on the market earned him runner-up honors in the National Collegiate Inventors Competition _ and a \$12,500 award.

Walker, who was born in Killeen, Texas, and grew up in Oklahoma City, comes from a family of physicians. His father, mother and older brother are all emergency-room doctors, but Walker chose a different route. "I always liked working with my hands and making things," he said. "Engineering seemed to be the more natural choice for me." Walker started his newest company _ Electroninks Inc. _ on Jan. 2. The name sounds a lot like "electronics," and that's no accident, since the ink is used in printed electronics.

His co-founder in the venture, Jennifer Lewis, is a former UI materials science professor who recently joined Harvard University's School of Engineering and Applied Sciences. The reactive silver ink is superior in several respects to colloidal inks conventionally used for printed electronics, Walker said. Those particle-based inks are "relatively expensive and difficult to make," he said. Plus, they require high annealing temperatures that can distort plastic printing surfaces, he added. Walker said the reactive silver ink is "simple to make," and small batches of it cost about \$2.50 per gram, compared with prices of \$10 to \$15 a gram for small quantities of colloidal inks. Walker said he has already approached several large customers in the biomedical and electronic circuitry fields about using the ink. The biggest market for the ink, he said, is thought to be the printed electronics market, which uses about \$1.5 billion in materials a year. But the biomedical industry can also use the ink in producing electrodes for pacemakers and diagnostic glucose sensors. Plus, the ink can be used in printing barcode labels and producing high-end decorative signs. The UI's Office of Technology Management has international and U.S. patents pending on the invention, Walker said. Lisa Dhar, the office's assistant director for life sciences and strategic initiatives, said the ink has several attractive attributes. It has a "conductivity that approaches that of bulk silver" and doesn't require high annealing temperatures, she said. Plus, it's compatible with a wide range of "deposition schemes," ranging from ink-jet printers to spray applications, she said. When scientific publications about the ink appeared, the Office of Technology Management was "inundated" with interest and requests from researchers and industry, Dhar said. Lewis, the co-founder of Electroninks, said she knows of only one other supplier of particle-free silver inks, and that's South Korea's InkTek.

She credited Walker as the lead in developing the ink. "Much of these advances come out of his ingenuity and hard work," she said, adding that Walker is working with 10 to 20 companies in developing inks for their applications. She credited Walker as the lead in developing the ink. "Much of these advances come out of his ingenuity and hard work," she said, adding that Walker is working with 10 to 20 companies in developing inks for their applications. "He's an excellent chemist as well as a material scientist," she said.

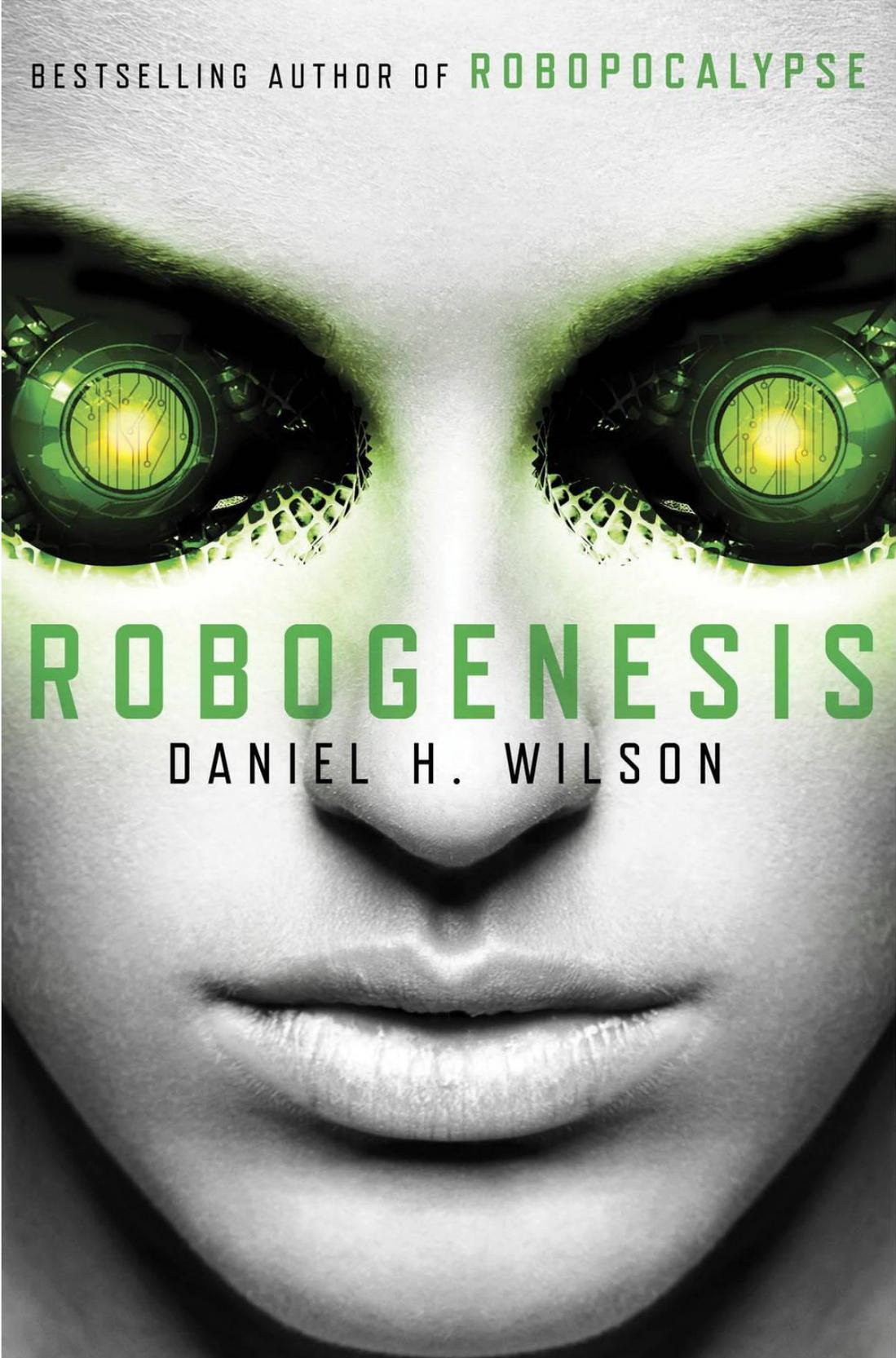
Lewis also credited Dhar and OTM Director Lesley Millar for supporting the technology and UI Research Park Director Laura Frerichs for helping to secure seed funding for the company through EnterpriseWorks' I-Start program for entrepreneurs. Walker's first brush with entrepreneurship came in high school when he founded Walker Tactical Systems, a business that catered to competitive shooters. He designed parts for guns _ particularly failure-prone parts, ranging from magazine funnels to firing pins. He still has the business today. While getting his undergraduate degree in mechanical engineering at Oklahoma State University, he developed a business that converted waste greases _ the kind collected in grease traps of sinks in commercial restaurants _ into biodiesel. The business, Biotek, sold the biodiesel to small trucking firms that blended it with diesel to save fuel costs. Later, the business ventured into slop oil reclamation, converting it to pipeline-grade fuel. Walker left that business when he started graduate school, and it's no longer around, he said. Walker said he chose materials science as his focus in graduate school because it's at "the intersection of a lot of interesting engineering fields." He initially worked on colloidal inks before concentrating on silver inks. Now he's working on new applications for silver inks. "I'm currently working on other variations of reactive silver inks from screen printing to ink-jet formulations into (conductive) textiles," he said.

Walker recently returned from Harvard, where he served as a visiting fellow. He said he was glad to return to Urbana, partly because "I don't like being crowded or cramped." ____ (c)2013 The News-Gazette (Champaign, Ill.) Visit The News-Gazette (Champaign, Ill.) at www.news-gazette.com Distributed by MCT Information Services.



DANIEL H. WILSON

BESTSELLING AUTHOR OF **ROBOPOCALYPSE**



ROBOGENESIS

DANIEL H. WILSON



Retinal Microangiopathy in a Mouse Model of Inducible Mural Cell Loss

- [Cammi N. Valdez*](#), [Joseph F. Arboleda-Velasquez*](#), [Dhanesh S. Amarnani*](#), [Leo A. Kim*](#),
- [Patricia A. D'Amore*](#),^{†,‡}

Show more

DOI: 10.1016/j.ajpath.2014.06.011

[Get rights and content](#)

Diabetes can lead to vision loss because of progressive degeneration of the neurovascular unit in the retina, a condition known as diabetic retinopathy. In its early stages, the pathology is characterized by microangiopathies, including microaneurysms, microhemorrhages, and nerve layer infarcts known as cotton-wool spots. Analyses of postmortem human retinal tissue and retinas from animal models indicate that degeneration of the pericytes, which constitute the outer layer of capillaries, is an early event in diabetic retinopathy; however, the relative contribution of specific cellular components to the pathobiology of diabetic retinopathy remains to be defined. We investigated the phenotypic consequences of pericyte death on retinal microvascular integrity by using nondiabetic mice conditionally expressing a diphtheria toxin receptor in mural cells. Five days after administering diphtheria toxin in these adult mice, changes were observed in the retinal vasculature that were similar to those observed in diabetes, including microaneurysms and increased vascular permeability, suggesting that pericyte cell loss is sufficient to trigger retinal microvascular degeneration. Therapies aimed at preventing or delaying pericyte dropout may avoid or attenuate the retinal microangiopathy associated with diabetes.

APPENDIX D

19th ANNUAL RESEARCH SYMPOSIUM

Stillwater, OK

WHAT IF you could...

- Explore Scientific Developments
- Meet Oklahoma's Best and Brightest Undergraduate Researchers
- Learn about Graduate School and Summer Internship Opportunities
- Converse with Distinguished Faculty and Mentors
- Listen to Nationally Renowned Speakers

All in one place!



OK-LSAMP 19th
Annual Research Symposium
Oklahoma State University - Stillwater
Noble Research Center
September 21, 2013

OK-LSAMP 19th Annual Research Symposium Agenda

08:00 AM - 09:30 AM	Video Loop		Room 106
08:00 AM - 11:00 AM	Registration Refreshments	ALL POSTERS MUST BE IN PLACE BY 10 AM Provided by DairyMax	1st Floor Atrium
09:00 AM - 09:30 AM	Welcome and Introductions	Kay Porter, OK-LSAMP Manager Jean Van Delinder, PhD, OK-LSAMP PI, Assoc. Dean Pamela Fry, PhD, Interim Provost, OSU Jason F. Kirksey, PhD, Assoc VP for Institutional Diversity Sheryl Tucker, PhD, Assoc Prov & Dean, Graduate College	Room 106
09:30 AM - 10:30 AM	Keynote Address	Dwight E. Adams, PhD Director, Forensic Science Institute University of Central Oklahoma	Room 106
10:30 AM - 11:15 AM	The World and You	Diana Lizarraga Program Director, Cal NERDS University of California - Berkeley	Room 106
11:15 AM - 11:20 AM	Announcements	Fara Williams, OK-LSAMP Coordinator	Room 106
11:20 AM - 11:30 AM	BREAK		
11:30 AM - 12:30 PM	Alliance Meeting	OK-LSAMP Administration, Campus Coordinators, and Invited Guests	Room 107
11:30 AM - 12:30 PM	Ethics in Research	Logan Watts Training Coordinator, OU Research Center University of Oklahoma	Room 106
12:30 PM - 02:00 PM	Poster Session and Lunch	Build Your Own Sandwich Lunch Presenters must be by their posters from 12:50 - 2 PM	1st Floor Atrium
02:00 PM - 02:10 PM	BREAK		
02:10 PM - 03:25 PM	Oral Presentations	<i>For Specific Times. See Presentations at a Glance"</i> Biological and Animal Sciences Mechanical Engineering Engineering Biological and Forensic Sciences Chemistry and Biochemistry	Room 108 Room 207 Room 216/218 Room 246 Room 348
02:10 PM - 03:25 PM	Core Facility Tour	Steve Hartson, PhD Director, Proteomics & Mass Spectrometry Core Facility Oklahoma State University	Meet by Registration Table
03:25 PM - 03:55 PM	Awards Presentation	1st, 2nd, and 3rd Place Poster Presentations 1st, 2nd, and 3rd Place Oral Presentations	Room 106
03:55 PM - 04:15 PM	Networking Social	Ice Cream Provided by Dairy Max	1st Floor Atrium
04:15 PM - 04:20 PM	Closing Remarks	Jean Van Delinder, PhD, OK-LSAMP PI	1st Floor Atrium

PLEASE VISIT ATRIUM TABLES THROUGHOUT THE DAY.

*Note: Symposium volunteers are designated on their name badges. They will gladly assist if you need information or directions.

KEYNOTE SPEAKER



DWIGHT E. ADAMS, Ph.D.

**Director, Forensic Science Institute
University of Central Oklahoma**

Ph.D. Botany, University of Oklahoma 1982

M.S. Biology, Illinois State University 1979

B.S. Biology, University of Central Oklahoma 1977

On July 1, 2006, Dr. Adams became the first Director of the University of Central Oklahoma Forensic Science Institute. The Institute leads continuing education in forensic science for professionals and UCO's undergraduate and graduate forensic science programs. Dr. Adams retired with 23 years from the FBI after serving as Director of the FBI Laboratory in Quantico, Virginia. The FBI Laboratory consists of 700 scientific, technical and response personnel and an operational budget of more than \$100 million. The FBI Laboratory is the largest and most complex laboratory of its kind in the world. In 2003, he was the recipient of the Presidential Rank Award as Distinguished Executive; the highest award given in the Federal Government.

Dr. Adams was a member of the FBI's research team that developed the DNA techniques first used in 1988. He has testified as a DNA expert in federal, state and local courts for the prosecution and defense in excess of 130 times. He also served on the national DNA Advisory Board responsible for creating standards governing all DNA testing crime laboratories in the U.S and was a member of the Attorney General's National Commission on the Future of DNA Evidence. Dr. Adams oversaw the creation of the National DNA database linking 175 crime laboratories and responsible for solving or aiding more than 100,000 cases nationwide. He is the author of numerous scientific publications, mostly in the field of DNA technology applied to human identification. He is currently a member of the Oklahoma Justice Commission dedicated to enhancing the reliability and accuracy of forensic science, and preventing wrongful convictions.

Oral Presenters

Funded by the National Science Foundation

Last Name	First Name	University	Discipline	Time	Room
Austin	Zoe	Oklahoma State University	Zoology	2:10 PM	108
Blair	Tanner	University of Oklahoma	Computer Engineering	2:10 PM	216
Carson	Sharonda	University of Central Oklahoma	Biology	2:25 PM	108
China Diliz	Monica	California State University, LA	Biological Sciences	2:10 PM	246
Corcega	Jose	University of Tulsa	Mechanical Engineering	2:25 PM	207
DeLoach	Eugene	Langston University	Biology	2:40 PM	108
Gadsden	Chandra	Cheyney University	Biology	2:25 PM	246
Johnson	Ryan	Langston University	Chemistry	2:10 PM	348
Jones	Kody	Oklahoma State University	Mechanical Engineering	2:10 PM	207
Jones	Kody	Oklahoma State University	Mechanical Engineering	2:55 PM	207
Linscott	Thomas	University of Tulsa	Biology	2:55 PM	108
Mathias	Amanda	Oklahoma State University	Animal Science	3:10 PM	108
Matthews	Milecia	Oklahoma State University	Mechanical Engineering	2:40 PM	207
McKinney	Martell	Langston University	Chemistry	2:25 PM	348
Moreno	Alexander	University of Oklahoma	Electrical Engineering	2:25 PM	216
Ntreh	Abigail	University of Oklahoma	Biochemistry	2:40 PM	348
Pollard	Kellyn	Langston University	Biology	2:40 PM	246
Singh	Rajah	Langston University	Chemistry	2:55 PM	348
Suddath	Shannon	University of Tulsa	Engineering Physics	2:40 PM	216
Thornton	Erin	University of Oklahoma	Environmental Engineering	2:55 PM	216
Vallejos	Yoselin	University of Central Oklahoma	Biology and Forensic Sciences	2:55 PM	246

Poster Presenters

OK-LSAMP 19th Annual Research Symposium

Last Name	First Name	University	Discipline	Poster #
Austin	Zoe	Oklahoma State University	Zoology	54
Berger	Lindsey	Oklahoma State University	Physiology	51
Bohan	Shundiin	East Central University	Biology	12
Broad	Brianna	Northeastern State University	Chemistry	20
Burgess	Brandon	Oklahoma State University	Plant and Soil Sciences	52
Butson	Eric	Oklahoma State University	Chemistry	21
Carter	Cord	Southeastern Oklahoma State University	Chemistry	22
Castenada	Maria	University of Tulsa	Biochemistry	4
Chicas-Mosier	Ana	Oklahoma State University	Zoology	55
Collier	Ashley	Oklahoma State University	Zoology	56
Comeaux	Evann	Langston University	Chemistry	23
Daggy	Nataly	Oklahoma State University	Nutritional Sciences	49
Davilla	Dustin	Southwestern Oklahoma State University	Chemistry	24
Davis	Kayla	Oklahoma State University	Biochemistry	5
Davis	Lindsay	Langston University	Chemistry	25
Dozier	Kelsey	Northeastern State University	Cell Biology	18
Eisemann	Amanda	University of Central Oklahoma	Biology	13
Etier	Zachary	Oklahoma State University	Mechanical/Aerospace Engineering	38
Fiddler	Brice	Oklahoma State University	Civil Engineering	30
Gleen	Staci	Langston University	Mathematics	37
Glover	Tiffany	Langston University	Biology	14
Gonce	Jennifer	Cameron University	Biochemistry	6
Green	Jennifer	Cameron University	Chemistry	26
Hill	Julien	Oklahoma State University	Computer Science	31
Hubbard	Caleb	Southwestern Oklahoma State University	Biology	15
James	Morgan	Langston University	Biological Sciences	8
James	Stephen	Oklahoma State University	Fire Protection and Safety	36
Johnson	Danica	Oklahoma State University	Nutritional Sciences	50
Johnson	Trokon	University of Tulsa	Electrical Engineering	33
Jones	Kody	Oklahoma State University	Mechanical Engineering	41

Last Name	First Name	University	Discipline	Poster #
Kanaly	Chelsea	University of Central Oklahoma	Biology	16
Kibble	Geoffrey	Oklahoma State University	Mechanical/Aerospace Engineering	39
King	Troy	Oklahoma State University	Microbiology	45
Lonetree	Ashley	Oklahoma State University	Biological Sciences	9
Martin	Nicholas	Northeastern State University	Biological Sciences	10
Mathias	Amanda	Oklahoma State University	Animal Science	1
McLeod	Devon	Oklahoma State University	Animal Science	2
Msengi	Naomi	Southern Illinois University, Edwardsville	Chemistry	27
Orozco	Juan	University of Central Oklahoma	Engineering Physics	34
Pham	Susan	Oklahoma State University	Chemistry	28
Phillips	Mary	Southwestern Oklahoma State University	Computer Science	32
Potts	Allison	Oklahoma State University	Animal Science	3
Ramirez	Abbey	Oklahoma State University	Natural Resources/Ecology Mgmt	48
Redhage	Keely	Oklahoma State University	Microbiology	46
Redmond	Jaron	Oklahoma State University	Mechanical Engineering	42
Riojas	Katie	University of Tulsa	Mechanical Engineering	43
Ross	Jodeci	Langston University	Technology	53
Snow	W. Paul	University of Central Oklahoma	Mechanical Engineering/Physics	44
Spencer	Chelsea	University of Central Oklahoma	Cell Biology	19
Talley	Andrea	Oklahoma State University	Biochemistry	7
Thompson	Linzi	East Central University	Environmental Health Sciences	35
Toal	Sheri	Oklahoma State University	Biological Sciences	11
Vega Recalde	Carolina	Oklahoma State University	Mechanical/Aerospace Engineering	40
Walker	Ashlie	Southwestern Oklahoma State University	Chemistry	29
Washington	Amber	Oklahoma State University	Microbiology	47
Webb	Jessica	University of Central Oklahoma	Biomedical Engineering	17



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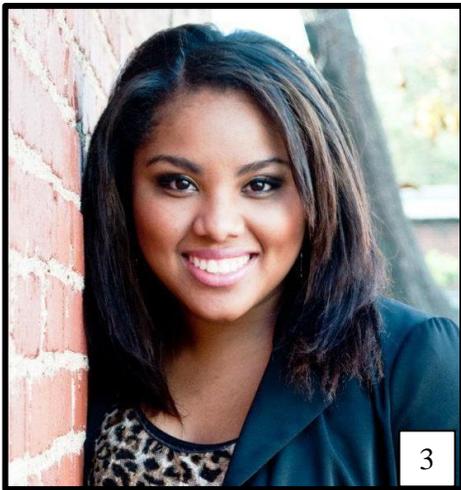
6

- (1) Poster Presentations
- (2) Oral Presentations
- (3) University of Oklahoma Scholars
- (4) Networking / judges
- (5) Oral Presentation
- (6) Top Winners: Allison Potts, Amanda Mathias, Kody Jones, Keely Redhage, Melicia Matthews, Chandra Gadsden

APPENDIX E

NATIVE AMERICAN AND PACIFIC ISLANDER
RESEARCH EXPERIENCE (NAPIRE)

Costa Rica

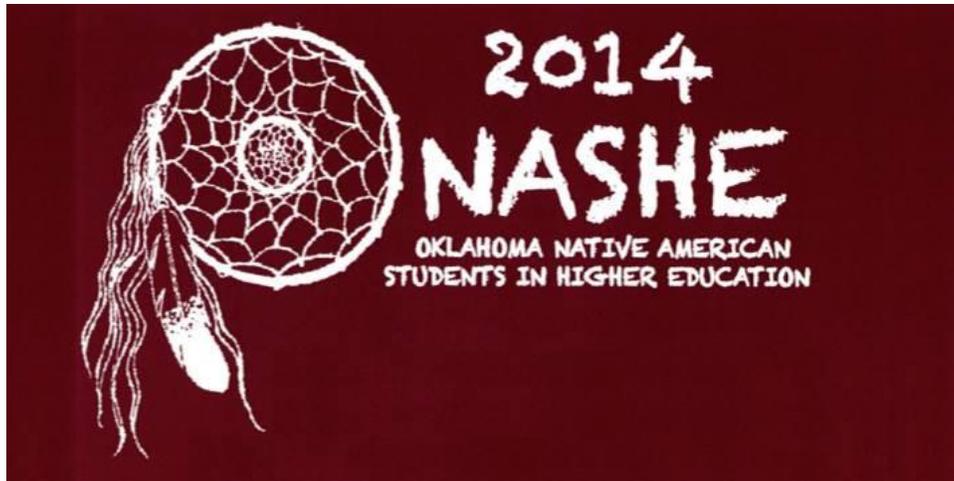


(1) Faculty Mentors; (2) Hannah White, OSU; (3) Morgan James, LU; (4) Sharonda Carson, UCO; (5) Ashley Lonetree, OSU

APPENDIX F

OKLAHOMA NATIVE AMERICAN STUDENTS
IN HIGHER EDUCATION (ONASHE)

Miami, OK



Participants received honor blankets



OSU Scholars attending conference

APPENDIX G

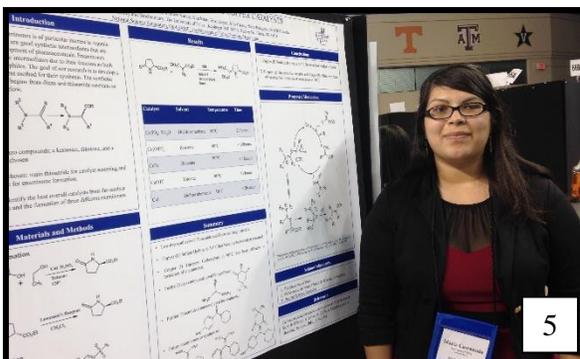
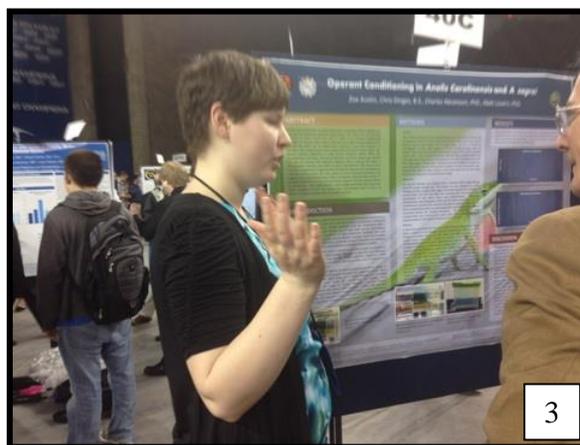
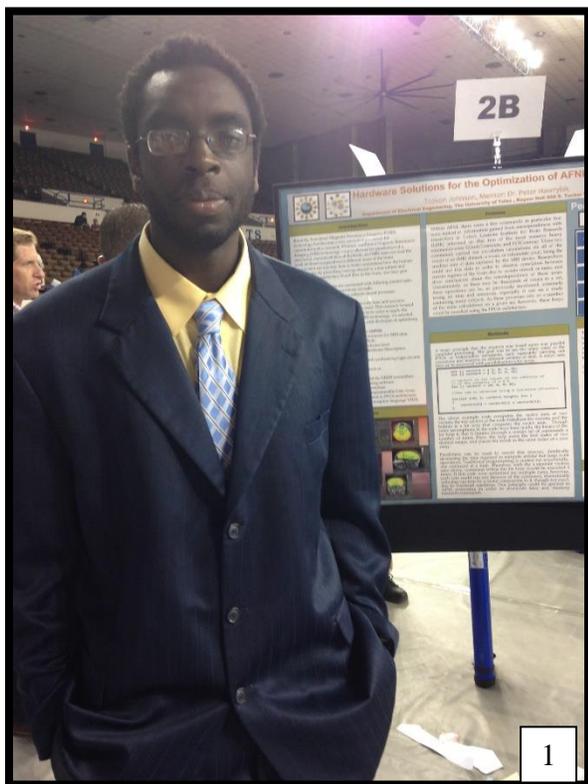
NATIONAL CONFERENCE ON UNDERGRADUATE
RESEARCH (NCUR)

Lexington, KY

NCUR[®] 2014

National Conference on Undergraduate Research
April 3-5





1:Trokon Johnson, TU; 2:Sharonda Carson, UCO; 3: Zoe Austin; 4: Amanda Mathias & Amber Washington, OSU; 5: Maria Castenea, TU

APPENDIX H

OKLAHOMA RESEARCH DAY

University of Central Oklahoma
Edmond, OK



<u>Fname</u>	<u>Lname</u>	<u>School</u>
Melissa	Merrifield	Cameron
Linzi	Thompson	ECU
Eugene	Deloach	Langston
Kellyn	Pollard	Langston
Deborah	Bowman	Langston
Amber	German	Langston
Tiffany	Glover	Langston
Evann	Comeaux	Langston
Lindsey	Davis	Langston
Ryan	Johnson	Langston
Gabby	Williams	Langston
Rajah	Singh	Langston
Jodeci	Ross	Langston
Quintin	Walker	Langston
Laurence	Smith	Langston
Beautiful Joy	Fields	Langston
<i>Attended but not presenting from Langston:</i> Staci Gleen Megan Bowlin Mary Jordan Jazmeen Smith Danielle Wright Nicole Newman Joseph Michael Fields		
Ashley	Lonetree	OSU
Anna	Chicas-Mosier	OSU
Sarah	Hamilton	OSU
Sheri	Toal	OSU
Geoff	Kibble	OSU
Stephen	James	OSU
Troy	King	OSU
Carolina	Vega	OSU
Zoe	Austin	OSU

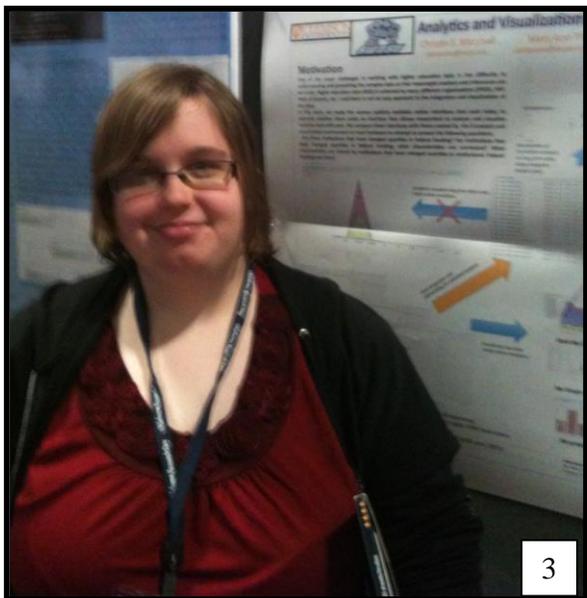
Megan Ashley	Ayala Rodriguez	SWOSU SWOSU
Caleb	Hubbard	SWOSU
Irene	Lopez	SWOSU
Ashlie	Walker	SWOSU
Ashlie	Walker	SWOSU
Mary	Phillips	SWOSU
Jeanna	Redd	UCO
Sharonda	Carson	UCO
Jeanna	Redd	UCO
Juan	Orozco	UCO
Juan	Orozco	UCO
Jessica	Webb	UCO
Luis	Figuroa	UCO
Paul	Snow	UCO
McKayla	Masburn	UCO
Cory	Anderson	UCO
<i>Double entry of names indicate two presentations during conference.</i>		



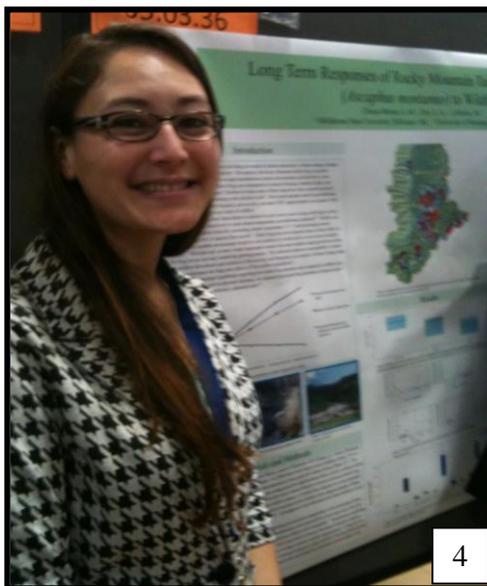
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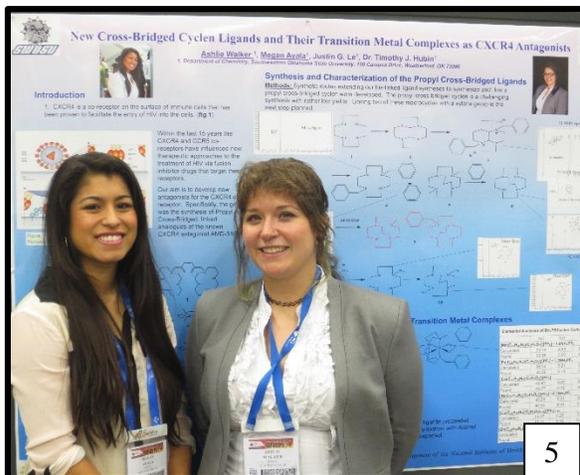


3



4

1: Rajah Sing, LU; 2:Troy King, OSU;
3:MaryAnn Phillips, SWOSU; 4:Anna Chicas-Mosier, OSU; 5:Megan Ayala & Ashley Walker, SWOSU



5

APPENDIX I

SOCIETY FOR THE ADVANCEMENT OF CHICANOS
AND NATIVE AMERICANS IN SCIENCE (SACNAS)

San Antonio, TX

SCHOLARS IN SCIENCE: NATIVE AMERICAN PATH
(SSNAP)



*Advancing Hispanics/Chicanos
& Native Americans in Science*

Strengthening the Nation
through Diversity, Innovation &
Leadership in STEM

**2013 SACNAS
CONFERENCE PROGRAM**



San Antonio, Texas • October 3-6, 2013

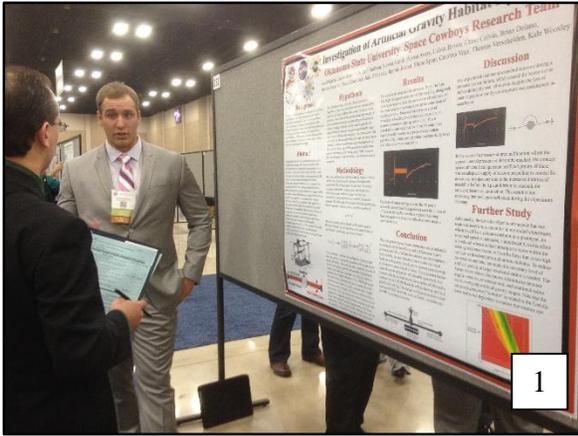


Back Row: Lindsey Berger, Jacob Calkins, Ashley Lonetree, Sharonda Cardon, Joy Deutchendorf, Daniel Andedrson, Grant Williams, Keely Redhage

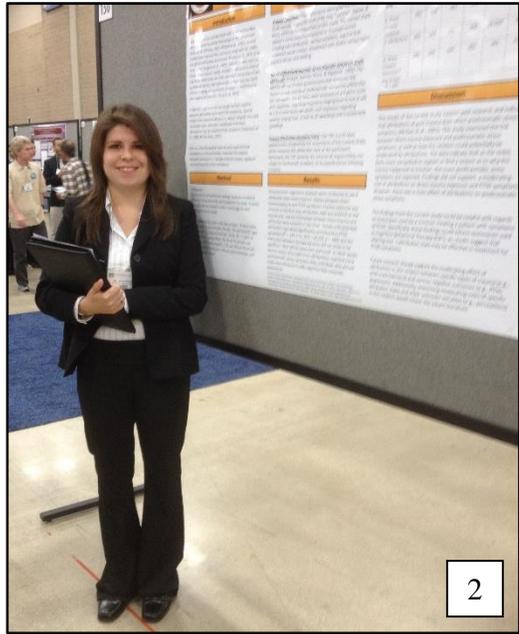
Middle Row: Shelby Rice, Amber Anderson, Amanda Mathias, Allison Potts, Sarah Hamilton, Jamie Bruner, Alex Hardison

Front Row: Adam Norwald, Jamie Bruner, Liz Zehren, David Supeck, Jessica Morrison





1



2



3



4

1: Geoff Kibble; 2: Jamie Bruner;
 3: Sara Hamilton & Jessica
 Morrison; 4: Keely Redhage,
 Jessica Morrison, Lindsey Berger:
 5: Ashley Lonetree, Sharonda
 Carson, & Fara Williams (Donald
 French in background)



5

APPENDIX J

WOMEN OF COLOR STEM CONFERENCE

Dallas, TX



CONFERENCE GUIDE

WOC 2013
WAVES OF CHANGE
CONNECTING + MENTORING
LEARNING
THE PATHWAY
TO SUCCESS



OCTOBER 17-19, 2013 | HILTON ANATOLE | DALLAS, TX

CO-HOSTED BY Prairie View A&M University
Career Communications Group's Women of Color magazine

www.womenofcolor.net



Scholars from ECU, LU, OSU, SWOSU



Linzi Thompson, ECU, Student Leadership Award: Research



Evann Comeaux, LU: Student Leadership Award: Leadership

APPENDIX K

WOMEN IN SCIENCE

Oklahoma City, OK



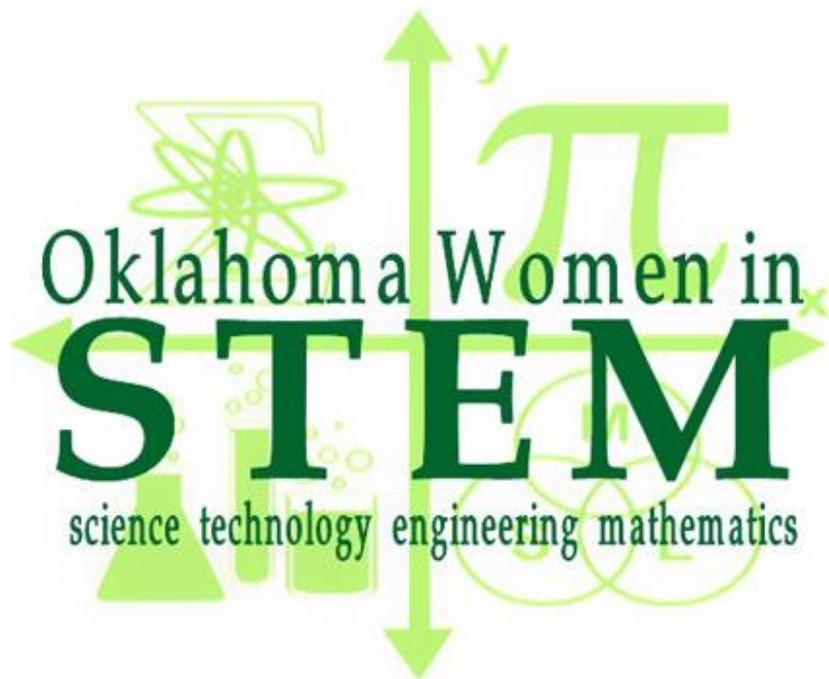
17th Annual Women in Science Conference had to be rescheduled due to severe weather in Oklahoma. Although over 600 high school girls and teachers were anticipated to attend.

OK-LSAMP Scholars were scheduled to serve in support roles for the conference and as peer mentors for the high school girls in attendance. Additionally, several Scholars were scheduled to operate a booth in the “hands-on” session and support in the Teacher’s Resource Room.

APPENDIX L

OKLAHOMA WOMEN IN STEM

Tulsa, OK



Oklahoma Women in STEM:
Breaking the STEM Glass Ceiling

Oklahoma State University LSAMP Scholars receive award for having the largest representation of women in attendance.



APPENDIX M

CHEROKEE NATION SCIENCE FAIR

Tahlequah, OK

CNSEF

Cherokee Nation National Science & Engineering Fair

Agenda January 25, 2014

Registration
8am - 9am

Project Set Up
8am to 9:30am

Floor Open, Judges Walk Thru
9:30am - 10:00am

Interview Judging
10:00am - 11:00am

Over All Judging & Call Backs
11:00am - 11:30am

Lunch On Your Own
11:30am - 12:30pm

Awards Program
12:30pm to 1:15pm

Breakdown
1:15pm to 2:00pm



GWYD D.H.
CHEROKEE NATION[®]



(1) Matt Takyi-Micah;
(2) Darren Figuerido;
(3) Dr. John Chaney;
(4) Gretchen Moore

APPENDIX N

BETA KAPPA CHI CONFERENCE

Houston, TX

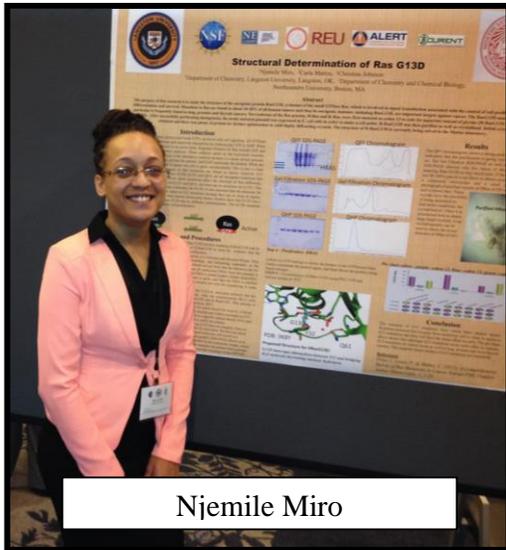
Ensuring STEM* Preparedness to Meet Global Health Challenges



The 71st Joint Annual Meeting of NIS and BKX, will be hosted by Prairie View A&M University, Houston, Texas. The meeting will take place on **March 12-16, 2014** at The Westin Houston, Memorial City, Houston Texas.

*STEM: Science, Technology, Engineering and Mathematics





Njemile Miro



Eugene DeLoach



Rajah Singh



Amber German



(1) Rajah Singh & Eugene DeLoach
(2) Tiffany Glover
(3) Eugene DeLoach, Denzel Pugh, & Rajah Singh
(4) Amber German & Phoebe Lewis
(5) Njemile Miro; Kellyn Pollard & Denzel Pugh

APPENDIX O

CAMPUS COORDINATOR / MENTOR

HIGHLIGHTS

Oklahoma Mentor Day Honorees Include

Dr. Carl Rutledge

East Central University

OK-LSAMP Campus Coordinator

0



*Oklahoma Foundation for Excellence President Les Risser (second from left) presented an **Outstanding Mentor Award** to Dr. Carl Rutledge during Oklahoma Mentor Day at the Capitol. They are joined by Rutledge's former students and mentees Erik Gonzales and Jonathan Gonzales, both OK-LSAMP Scholars and BD Fellows.*

the TIGER CHARGES



PHYSICS DEPARTMENT ALUMNI NEWSLETTER

Silver Tiger
Awarded to
Dr. Rutledge.
1981-2013....



No, he has not retired yet and Dr. Weems is also a Silver Tiger. Alumni may become a Silver Tiger also.

Memorial Bench for Dr. John Bulman Installed

One day in June, I noticed a memorial bench for Dr. John Bulman south of the Tiger fountain. Thanks to those that funded the memorial bench. It was a surprise to me. It has yet to be dedicated as of press time. Berta Bulman died March 23, 2013.



ECU Physics Tied for 1st Place in Native American BS Graduates.

In a July meeting in Portland with Roman Czujko (AIP Statistics Division), Dr. Williams mentioned that ECU graduated quite a few Native Americans. Roman is the curious type and the next morning he emailed this: "East Central University has awarded a large number of physics bachelor's degrees to Native Americans. I checked the data from NCES (National Center for Education Statistics) of the Department of Education. In fact, over the last 10 years East Central University awarded the largest number of physics bachelor's degrees of any university in the U.S. East Central and is credited with 10, the next two large producers were Ft. Lewis College (CO) also with 10 and MIT with 9. By the way, there were only a total of 268 Native Americans who earned physics bachelor's degrees across the U.S. over the last 10 years combined." Roman says this is a "remarkable achievement".

Pg1



NAPIRE 2014
Faculty
Mentors in
Costa Rica at
the Wilson
Botanical
Gardens



Sharon Lewis,
Langston
University
faculty mentor

APPENDIX P

SCHOLAR AND BD FELLOW
PUBLICATIONS

Chelsea Smith, Co-Author

[Cell Biol Int.](#) 2014 Apr 25. doi: 10.1002/cbin.10289. [Epub ahead of print]

A new bioassay identifies proliferation ratios of fibroblasts and myofibroblasts.

[Vaughan MB](#)¹, [Odejim TD](#), [Morris TL](#), [Sawalha D](#), [Chelsea S](#).

Author information

Abstract

Myofibroblasts are resident cells of wound healing, contractures and fibroses, and tissues are often referred to as fibroproliferative. Whether myofibroblasts themselves proliferate is of interest. Since many in vitro cultures are heterogeneous, staining in situ is required to identify the myofibroblast. We have tested a newly available fluorescent staining kit using ethynyl deoxyuridine (EdU) and click chemistry to identify EdU incorporation into the replicated DNA of proliferative cells. The proliferation stain was combined with the definitive myofibroblast immunostain for alpha smooth muscle actin (α -sma). Fibroblasts were grown on coverslips and within attached collagen lattices. Cultures were pulsed with EdU 4 h prior to fixation. Different standard methods of fixation and permeabilization were used to test the effects of these variables on EdU and α -sma labeling. Images of the stained samples were quantified as the total percentage of proliferative cells, as well as the proportion of fibroblasts and myofibroblasts that were proliferating. Proliferative myofibroblasts were identified in both culture conditions and with all preparation methods tested. Proliferation within the fibroblast population was greater than within the myofibroblast population in both culture conditions. Fixation and permeabilization had little effect on EdU or α -sma labeling. This method of identifying proliferative myofibroblasts could be useful in future studies of myofibroblast proliferation within heterogeneous populations.

This article is protected by copyright. All rights reserved.

KEYWORDS:

Actin, Cell cycle, Cell differentiation, Cellular imaging, Fluorescence, Myofibroblast, Techniques

Ashley Rodriquez, Lead Author



Analysis of differential gene expression profiles in *Caenorhabditis elegans* knockouts for the v-SNARE master protein 1

Ashley Rodriguez, Kody McKay, Melanie Graham, Josiah Dittrich and Andrea M. Holgado*

ABSTRACT:

At chemical synapses, neurons communicate information to other cells by secreting neurotransmitters or neuropeptides into the synaptic cleft, which then bind to receptors on the target cell. Preliminary work performed in our laboratory has shown that mutant nematodes lacking a protein called VSM-1 have increased synaptic density compared with the wild type. Consequently, we hypothesized that genes expressed in *vsm-1* mutants mediate enhanced synaptogenesis. To identify these genes of interest, we utilized microarray technology and quantitative PCR. To this end, first we isolated the total RNA from young-adult wild-type and *vsm-1* mutant *Caenorhabditis elegans*. Next, we synthesized cDNA from reverse transcription of the isolated RNA. Hybridization of the cDNA to a microarray was performed to facilitate gene expression profiling. Finally, fluorescently labeled microarrays were analyzed, and the identities of induced and repressed genes were uncovered in the open-source software Magic Tool. Analyses of microarray experiments performed using three independent biological samples per strain and three technical replicas and dye swaps showed induction of genes coding for major sperm proteins and repression of SPP-2 in *vsm-1* mutants. Microarray results were also validated and quantified by using quantitative PCR. © 2014 Wiley Periodicals, Inc.

Keywords:

- v-SNARE master protein 1;
- membrane trafficking;
- synapses;
- gene expression

Linzi Thompson, Co-Author
Pages 26-34



Co

Corrosion in STP Sumps

What Causes It
and What Can Be
Done About It?

:

COMPREHENSIVE
PSYCHOLOGY

2013, Volume 2, Article 4
ISSN 2165-2228

DOI 10.2466/11.17.CP.2.4
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NoDerivs CC-BY-NC-ND

Received February 15, 2013
Accepted March 10, 2013
Published April 30, 2013

CITATION

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Chicas-Mosier, A. M. (2013)
Recruiting for science,
technology, engineering, and
mathematics disciplines:
perspectives of Black and
Hispanic entomologists.
Comprehensive Psychology,
2, 4.



Ammons Scientific
www.AmmonsScientific.com

Recruiting for science, technology, engineering,
and mathematics disciplines: perspectives of Black
and Hispanic entomologists^{1,2}

Charles I. Abramson
Lisa A. Curb
Ana M. Chicas-Mosier

Oklahoma State University

Abstract

This study reports the results of a survey focused on the views of Black and Hispanic entomologists toward the recruitment of under-represented groups to entomology. The respondents, 7 Black and 11 Hispanic out of an estimated population of 43 Black entomologists and 54 Hispanic entomologists, were asked to comment on several open-ended questions including challenges and prospects for the future. Implications about recruitment of under-represented groups to the field of entomology included using same-race mentors, establishing programs linking entomology departments to historically black colleges and high schools, and developing entomology-based programs in the inner city. With regard to challenges for the future and future prospects, many of the respondents voiced concern about the future of entomology as a separate discipline, discrimination against minorities in science, and lack of opportunity.

An obstacle to workforce diversity in entomology and other natural sciences is the ability to recruit and retain students from underrepresented groups. Over thirty years of effort to increase the number of underrepresented groups in entomology and other "STEM" disciplines (collectively known as science, technology, engineering, and mathematics) have met with mixed success. Surveys and interviews have revealed numerous barriers (Frankina, 1992; Brazziel & Brazziel, 2001; Maton & Hrabowski III, 2004; Armstrong, Berkowitz, Dyer, & Taylor, 2007). These barriers include the possibility of obtaining gainful and meaningful employment, debt and the subsequent ability to repay student loans, advanced degrees perceived as teaching degrees associated with low salary, insufficient information coupled with little or no advisement on how to pursue the degree, lack of family support, low math and science involvement in high school, perception of science being dominated by and more suited for Caucasians, and poor or no mentorship.

We hope that this article will stimulate discussion of recruiting under-represented groups to STEM disciplines, including those related to psychology, such as comparative psychology and behavioral neuroscience. An ancillary concern is recruiting underrepresented groups to the National Science Foundation Research Experience for Undergraduate Program (NSF-REU; Page, Abramson, & Jacobs-Lawson, 2004). These programs have been shown to increase minority involvement and retention by exposing students to research and involving them in STEM fields.

We use the field of entomology as a model for two reasons. Firstly, the primary contribution of the senior author is in the study of invertebrate behavior including insects. Unlike entomologists, the senior author has the benefit of extensive experience in both psychology and entomology. Secondly, unlike the social sciences, there are few Blacks and African Americans in U.S. entomology departments (Chang, Cerna, Han, & Saenz, 2006).

¹Address correspondence to Dr. C. I. Abramson, Oklahoma State University, Laboratory of Comparative Psychology and Behavioral Biology, Departments of Psychology and Zoology, 116 N. Murray, Stillwater, OK 74078 or e-mail (charles.abramson@okstate.edu).

²This research was support in part by National Science Foundation Grant DBI-0851651. We would also like to specifically thank our respondents who took the time to share their views.

Aversive conditioning in honey bees (*Apis mellifera anatolica*): a comparison of drones and workers

1. Christopher W. Dinges,
2. Arian Avalos,
3. Charles I. Abramson,
4. David Philip Arthur Craig,
5. Zoe M. Austin,
6. Christopher A. Varnon,
7. Fatima Nur Dal,
8. Tugrul Giray and
9. Harrington Wells

- Received April 22, 2013.
- Accepted July 22, 2013.

SUMMARY

Honey bees provide a model system to elucidate the relationship between sociality and complex behaviors within the same species, as females (workers) are highly social and males (drones) are more solitary. We report on aversive learning studies in drone and worker honey bees (*Apis mellifera anatolica*) in escape, punishment and discriminative punishment situations. In all three experiments, a newly developed electric shock avoidance assay was used. The comparisons of expected and observed responses were performed with conventional statistical methods and a systematic randomization modeling approach called object oriented modeling. The escape experiment consisted of two measurements recorded in a master–yoked paradigm: frequency of response and latency to respond following administration of shock. Master individuals could terminate an unavoidable shock triggered by a decrementing 30 s timer by crossing the shuttlebox centerline following shock activation. Across all groups, there was large individual response variation. When assessing group response frequency and latency, master subjects performed better than yoked subjects for both workers and drones. In the punishment experiment, individuals were shocked upon entering the shock portion of a bilaterally wired shuttlebox. The shock portion was spatially static and unsignalled. Only workers effectively avoided the shock. The discriminative punishment experiment repeated the punishment experiment but included a counterbalanced blue and yellow background signal and the side of shock was manipulated. Drones correctly responded less than workers when shock was paired with blue. However, when shock was paired with yellow there was no observable difference between drones and workers.

Joshua Warren, Co-Author

Feature-positive and feature-negative learning in honey bees

Charles I. Abramson¹, Ibrahim Cakmak², Meghan E. Duell³, Leah M. Bates-Albers⁴, Enoc M. Zuniga⁵, Loma Pendegraft¹, Amanda Barnett⁶, Carmen L. Cowo⁴, Joshua J. Warren⁷, Aaron C. Albritton-Ford⁸, John F. Barthell⁴, John M. Hranitz³ and Harrington Wells^{9,*}

SUMMARY

Honey bees (*Apis mellifera anatolica*) were subjected to sequential trials where they were given the choice between a feature-positive and a feature-negative feeding plate. The ‘feature’ being manipulated is the presence of a single blue circle among three circles marking the location of a small sucrose reward. That is, a ‘feature-negative’ target had three white circles, while a ‘feature-positive’ target had two white circles and one blue one. Two experiments were performed. In both experiments, each bee was tested under two different reward scenarios (treatments). In the first experiment, during the feature-positive treatment bees received 4 μl of 2 mol l^{-1} sucrose when choosing the feature-positive plate, but received 4 μl of saturated NaCl solution (saltwater) when choosing the feature-negative plate. During the feature-negative treatment, bees were rewarded when visiting the feature-negative plate, while visitation to the feature-positive plate only offered bees the saltwater. The second experiment was a repeat of the first except that pure water was offered instead of saltwater in the non-rewarding feeding plate. As an experimental control, a set of bees was offered sequential trials where both the feature-positive and feature-negative plates offered the sucrose reward. Bee feeding plate choice differed between the feature-positive and feature-negative treatments in both experiments. Bees favored the feeding plate type with the sucrose reward in each treatment, and never consumed the saltwater or pure water when encountered in either treatment. Further, behavior of bees during both the feature-positive and feature-negative treatments differed from that of control bees. However, neither feature-positive nor feature-negative learning reached high levels of success. Further, a feature-positive effect was seen when pure water was offered; bees learned to solve the feature-positive problem more rapidly. When we tested bees using simply the choice of blue *versus* white targets, where one color held the sucrose reward and the other the saltwater, a bee's fidelity to the color offering the sucrose reward quickly reached very high levels.

KEY WORDS

- [Apis mellifera](#) [feature-positive](#) [feature-negative](#) [discrimination conditioning](#)

Biochemical role of crucial TonB protein in bacterial iron transport and pathogenesis

July 1, 2013

Kansas State University

Summary:

Scientists have discovered the role of the membrane protein TonB in bacteria that cause a wide variety of diseases, including typhoid fever, plague, meningitis and dysentery. Results may lead to new and improved human and animal antibiotics.

A Kansas State University-led study has discovered the role of a protein in bacteria that cause a wide variety of diseases, including typhoid fever, plague, meningitis and dysentery. The results may lead to new and improved antibiotics for humans and animals. Phillip E. Klebba, professor and head of the department of biochemistry and molecular biophysics, made the findings with two colleagues in the department: Lorne D. Jordan, doctoral candidate, Manhattan, and Salette M. Newton, research professor. The collaboration included other biophysicists at the University of Oklahoma and Purdue University. Their study, "Energy-dependent motion of TonB in the Gram-negative bacterial inner membrane," appears in the journal *Proceedings of the National Academy of Sciences*, or *PNAS*. The research focuses on the central role of iron in biochemistry. Both animals and bacteria require iron for biological processes like energy generation and DNA, Klebba said. The iron acquisition systems of bacteria, however, contribute to infectious diseases. "Iron is the object of a microbiological war in the human body," Klebba said. "Host proteins defend cells and tissues by sequestering the metal, and successful pathogens overcome this barrier and capture the iron. But the iron transport mechanisms of pathogenic organisms are not well understood." The membrane protein TonB plays an indispensable role in the uptake of iron by Gram-negative bacteria -- a classification of bacteria that is more resistant to antibiotics because of a nearly impenetrable cell wall. Gram-negative bacteria can cause diseases such as *Escherichia coli*, *Salmonella typhi*, *Yersinia pestis*, *Vibrio cholera*, *Brucella abortus*, *Neisseria meningitidis* cause many diseases and clinical conditions; they all transport iron by the same mechanism that depends on the actions of TonB. Despite decades of research, the biochemical role of TonB in Gram-negative bacteria was a scientific mystery, Klebba said. He and his colleagues found that the cellular electrochemical forces put TonB in a spinning motion that provides the energy and physical mechanism to enable iron uptake into the cell. "In this sense TonB acts like an electric motor that constantly rotates in response to the cellular energy flow," Klebba said. "TonB is one of nature's smallest and oldest electrical devices." According to Klebba, future antibiotics may block the functions of TonB, prevent iron acquisition by Gram-negative cells, and consequently protect humans and animals from infection by such pathogen strains of bacteria. Besides the *PNAS* study, Klebba recently shared the findings at the 2013 Gordon Conference on Mechanisms of Membrane Transport in South Hadley, Mass.

APPENDIX Q

SCHOLAR AND BD FELLOW

HIGHLIGHTS



Top researcher

Courtesy Photo

East Central University student Linzi Thompson, left, is pictured with Sen. Susan Paddack. Thompson presented her research poster on groundwater remediation during Research Day, sponsored by the Oklahoma Experimental Program to Stimulate Competitive Research. She was one of 25 students from 19 Oklahoma colleges and universities who were selected by their institutional presidents as the top undergraduate researchers in Oklahoma.

Linzi Thompson, East Central University



Elizabeth Krause, Cameron University Scholar spent 9 months interning at Walt Disney World, Florida.



Alfa Abame, SWOSU Scholar and biology major, received the Newman Civic Fellow by Campus Compact, recognizing her as one of 196 students from 36 states for her investment in finding solutions for challenges in her community.

REU-Microbiology (Research Experience for Undergraduates in Microbiology)



Keely Redhage from Oklahoma State University was a part of the summer 2013 participants featured on the front cover of the University of Wisconsin Department of Bacteriology webpage.

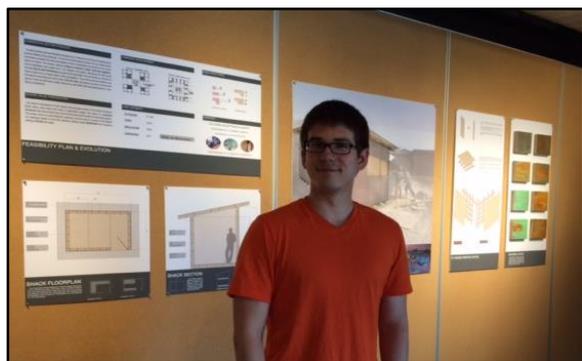
From left to right: Front Row: Katy France (Program Administrator) Keely Redhage (Oklahoma State University) Hsuan Peng (Berea College) Milady Martes (University of Puerto Rico-Mayaguez) Renan Correa (West Virginia University), Dan Figdore (Upper Iowa University), Dr. Jon Roll (Program Director) Back Row: Sarah DeBehnke (Carroll University), Joe Bell (Howard University), Angelica Cruz-Lebron (University of Puerto Rico-Humacao) Jedediah Seltzer (Grove City College)



CORD CARTER and JAMES SHARP, SWOSU, accepted Chapter Awards at the National American Chemistry Conference in New Orleans, LA.



BRICE FIDDLER, OSU, participated in Engineers Without Borders to Guatemala.



CAMERON PATTERSON, OSU, designed a house for third world country residents with the ability to expand the walls for a small amount of money.

OK-LSAMP Scholars among Native Americans chosen for international research program

Thursday, 13 March 2014 22:05



Two Oklahoma State University students are among three Native American scholars chosen to participate in prestigious international research programs set for this summer in France and Brazil. Amanda Mathias of Inola, Okla., and Keely Redhage of Poteau, Okla., have been chosen to participate in the International Research Experiences for Undergraduates (iREU) program. The research program offers outstanding scholars opportunities to work with globally-known researchers, chemists and materials scientists while experiencing the cultures of their host countries.

Nationally, a total of 13 scholars were selected for the iREU (research) program this year, including the three Oklahomans who applied for the opportunity through the OK-LSAMP program for minority students. "OK-LSAMP may be the first of its kind in the U.S. to have so many outstanding Native American women students earn a trip abroad in the iREU program. It certainly is a first in my 25-year career, which includes work with hundreds

of U.S. undergraduates," said Dr. Randy Duran, iREU director of the Office of Undergraduate Research at Louisiana State University.

Amanda Mathias, a senior in animal science at OSU, will spend 12 weeks conducting research in animal agriculture in three different labs with professors and the staff of the Federal Rural University in Purnambuco, near Recife, Brazil. When she returns to the U.S., Mathias will start in the Ph.D. program in the Louisiana State University School of Animal Science. She will receive the National Science Foundation Bridge to the Doctorate Fellowship.

Keely Redhage, a senior in microbiology at OSU, will spend at least 10 weeks in Lille, France, at the world famous Pasteur Institute with Dr. Priscille Brodin. Redhage has been offered the opportunity to extend her research to a six-month program. She has also been offered a dean's fellowship to pursue a Ph.D. in biochemistry and molecular biology at the Mayo Graduate School in Rochester, Minn., when she returns from France.

Ashley Walker, a senior chemistry major at Southwestern Oklahoma State University, is another OK-LSAMP scholar who has been selected for a trip to France. Walker, from Sand Springs, Okla., will spend 12 weeks in Grenoble, France, at Joseph Fourier University with plans to extend her stay there to six months. She will work with professors Eric Saint-Aman and Guy Royal.

The three scholars will first travel to National Science Foundation headquarters in Washington, D.C. in April to present their research posters. The iREU program and OK-LSAMP are funded by the National Science Foundation.

OK-LSAMP is the Louis Stokes Alliance for Minority Participation, a consortium of Oklahoma colleges and universities working together to develop programs aimed at increasing the number of students from under-represented populations who receive degrees in Science, Technology, Engineering and Mathematics (STEM) disciplines.



Dr. Jason Kirksey, associate vice president and head of the Division of Institutional Diversity at OSU, is the principal investigator for the OK-LSAMP program.

THIS WEEK AT ECU

GET INVOLVED IN CAMPUS ACTIVITIES

Thursday, Jan. 30
 - Dr. Raniyah Ramadan Symposium, Estep Media Center, 1 p.m.
 - Wade Bowen Concert, Kerr Activities Center, 8 p.m.

Saturday, Feb. 1
 - Quiz Tournament, Horace Mann 3rd Floor, 10 a.m.
 - Baseball vs. Cameron (Doubleheader), Tiger Field, 12 p.m.

Sunday, Feb. 2
 - Baseball vs. Cameron, Tiger Field, 1 p.m.

Wednesday, Feb. 5
 - Hunger Games
 "Catching Fire" Movie and Ice Cream, Pesagi Lobby, 7:30 p.m.

WEEKLY FORECAST

THURSDAY - SUNDAY
Average HI | 46°F
Average Lo | 32°F
 Partly cloudy Thursday. Partly cloudy Friday. Mostly cloudy Saturday and cloudy Sunday.

PRICES AT THE PUMP



ECU Student Travels to Help Researchers



Passion Provides Experience of Lifetime

BY AMRIA NORMAN
Staff Writer

Christmas break for most students involved spending time at home relaxing with no worries. One ambitious student was an exception. She journeyed to Southeast Asia to make a difference in the lives of the people there.

Linzi Thompson, Sulphur junior, came up with the idea and traveled alone at her own expense to Cambodia to do volunteer research and teach English.

She went from Siem Reap to Phnom Pehn and Poy Japn before meeting up with two people from the Society for Environmental Exploration. She then joined other members of the group to conduct marine research on the untouched island of Koh Smach.

"It took me about six hours by bus to travel to the capital from the city where I landed," Thompson said. "Then I got in a van for about eight hours that was full of locals who didn't speak a word of English. After that I was pointed to a tiny boat with a guy who also didn't speak English. I just hoped I was in the right place."

Thompson basically lived



Take Me Home: Linzi Thompson is surrounded by students from the Future of Khmer Children's School.

in a hut for the time she was there. She didn't have running water or electricity. She had to drink rainwater and take showers by getting buckets full of water from the well.

The SEE had been doing marine conservation work on the island for a year. Thompson had to learn about the area before helping them. "They taught me to survey the fish and reef to make sure the health of the environment was not deteriorating," Thompson said.

Research needed to be done, because China is building casinos and hotels on the mainland. SEE is trying to find out if that will damage the reef and its inhabitants.

"I biked to school everyday. It was about 20 minutes on a crazy highway."

-Linzi Thompson



Thompson was there for one week before she left to go back to Siem Reap to teach English at the Future of Khmer Children's School for the remainder of her three week stay. Everyday, she would bike for about 20 minutes to school where two groups of about 100 students attended.

They split them into mornings and afternoons and they were divided into beginner, intermediate and advanced Eng-

lish. Classrooms were mostly outside and surrounded by farms.

"They want native English speakers as TAs to help the students with proper pronunciation," Thompson said, "and to help the Cambodian teachers out when they don't understand."

"I enjoy traveling and hope to volunteer overseas again soon," Thompson said.

CONTACT US at the JOURNAL

LETTERS TO THE EDITOR, OP-EDS, COLUMNS, REVIEWS, STUDENT VOICE AND ALL OTHER SUBMISSIONS
 Submissions may be sent via e-mail, campus mail or posted on Facebook. Submissions must include name, daytime phone number and place of residence. All submissions are edited for space and clarity.
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Ashlie Walker, SWOSU,
enjoying her iREU in France



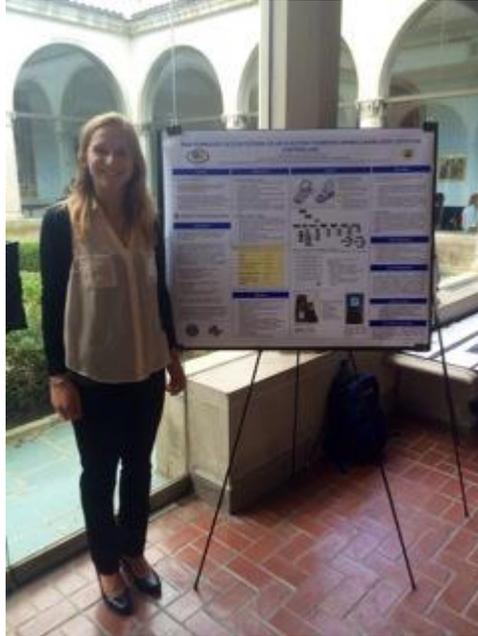
Keely Redhage, OSU, with Dr. Broden, Institute
Pasteur de Lille



Amanda Mathias, OSU, in Brazil enjoying a
shopping experience at a local market.

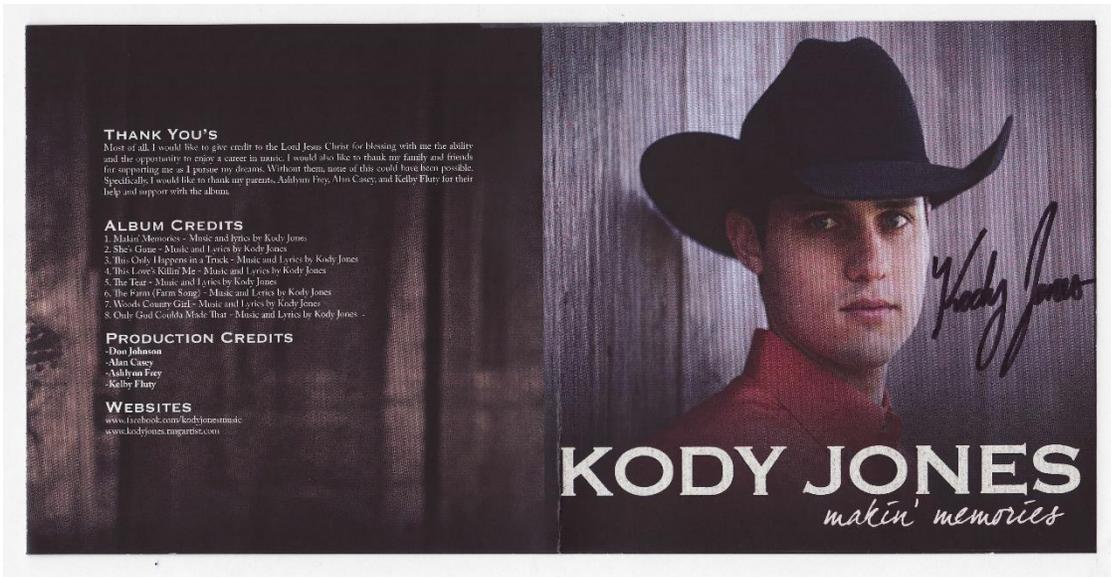
Bree Cooper
OU, enjoying Italy.





Katy Riojas,
University of Tulsa,
showing the
controller for her
wheelchair and
presenting her
summer research at
the University of
Pittsburg.

Kody Jones, CD cover



Jonathan Gonzales



OSU BD Fellow RECEIVES FUNDING FOR SBIR GRANT PROPOSAL

This NSF grant is part of the Small Business Innovation Research (SBIR) program. The purpose of the funding is to help companies determine the technological feasibility of a particular high risk product in order to foster commercial growth, especially for startups who require the initial capital for research.

Integsense, Inc. was founded in 2012 whose aim is to further develop and commercialize sensor technology invented by Dr. Reza Abdolvand (University of Central Florida) and myself. IntegSense is currently focused on the development of the proposed sensor technology for point-of-care medical diagnostic devices. I serve as the PI of this grant and am in charge of developing the sensor technology and managing others in order to accomplish the objectives set forth in the proposal.

Article appeared in:

OSU State Magazine, Fall 2014 issue,

Houston Chronicle: US & World

Timesnions.com

The Republic, Columbus, Indiana

Recruiting Native American students to medicine, science careers focus of effort at OSU

Kristi Eaton, Associated Press

September 14, 2014



This May 2014 photo provided by Kent Smith shows from left to right in the back row are: Sara Hofferber, Jerad Wahkinney, T'ata Roberts, Brent Battles, Nicholas Czaplewski and Darrin Pagnac. Students, mentors and scientists collect vertebrate fossils and rock sediments for radiometric analysis in west-central Nevada. Smith is leading the newly created Office for the Advancement of American Indians in Medicine and Science at Oklahoma State University Center for Health Sciences in Tulsa to recruit more American Indian high school and college students into medicine and science careers. Pictures (Kent Smith, AP / Kent Smith)

OKLAHOMA CITY (AP) — Oklahoma State University's Center for Health Sciences has started an initiative hoping to draw more Native American high school and college students into the medicine and science fields.

The *Office for the Advancement of American Indians in Medicine and Science* was created at the Tulsa-based medical school in April.

Associate dean Kent Smith said it's important for more American Indians to go into the science and medicine fields because Native culture revolves around nature, animals and plants. By recruiting more Native Americans into the fields, it will have a positive impact on all Oklahoma communities, he said.

But studies show that few Native Americans choose to go into the fields of science, technology, engineering or mathematics, or STEM fields. About 51 percent of American Indian students graduate from high school, and of those, only about 2.5 percent choose to enter a STEM field, according to a report from *Education Week*.

"We want to ultimately increase the number of Native people going into science and medicine. But at the end of the day, if Native people earn their bachelor's degree, I think we've succeeded," Smith said.

One reason Smith believes fewer Native American students go into STEM fields is because of a lack of mentors. That's why Smith, who is a member of the Comanche and Chickasaw Nations, is using his role to reach out to the state's 39 tribes and to support Native student programs including one he founded called Native Explorers that combines anatomy, paleontology and medicine with American Indian culture.

The office, Smith said, will show students that they can go to school in Oklahoma and not have to leave their families and support networks, which is often important for Native Americans who grew up in households where family is the focus.

Linsea Howard, a 23-year-old member of the Cherokee Nation, was one of three second-year medical students who presented mini STEM camps to middle and high school students in the Durant area this summer. Howard said she was interested in speaking with the younger students to try to get them interested in the science and medicine fields.

"I didn't have a lot of that growing up. I know a lot of kids from really highly populated Native areas don't always get exposure to that," she said.

Howard, who grew up in Tahlequah, the capital of the Cherokee Nation, added that having that exposure at a younger age could have helped her decide earlier on that she wanted to go into the medical field.

APPENDIX R

BRIDGE TO THE DOCTORATE

FELLOWS

	Last Name	First Name	Ethnicity	Discipline
<u>COHORT 7 – OKLAHOMA STATE UNIVERSITY</u>				
Continuing	Baldrige	Blair	African American	Engineering
Continuing	Burgess	Brandon	Native American	Plant & Soil Sciences
Continuing	Dyer	Joseph	Native American	Natural Resources
Continuing	Fiddler	Brice	Native American	Engineering
Continuing	Frazier	Shelby	Native American	Zoology
Continuing	Gregory	Cook	African American	Biomedical Sciences
Continuing	Hall	Jeremy	African American	Engineering
Continuing	Lightfoot	Jorge	Hispanic	Zoology
Continuing	Matthews	Melicia	African American	Engineering
Continuing	Potts	Allison	Native American	Forensics
Continuing	Sunny	Evans	Native American	Entomology
Continuing	Zehren	Liz	Native American	Medical Physics
<u>COHORT 6 – THE UNIVERSITY OF OKLAHOMA</u>				
Continuing	Dixon	Daniel	African American	Chemical Engineering
Continuing	Christina	Bruxvoort	Hispanic	Biochemistry--HSC
Continuing	Jared	Giem	Native American	Radiological Sciences--HSC
Continuing	Josh	Hardisty	Pacific Islander	Geophysics
Left program No degree	Luis	Lazu	Hispanic	Mathematics
Continuing	Kayla	Love	African American	Biochemistry
Continuing	Alex	Moreno	Hispanic	Electrical Engineering
M.S.-continuing	Abigail	Ntreh	African American	Biochemistry
M.S.-continuing	Allison	Quiroga	Hispanic	Civil Engineering
Continuing	Cortes	Williams	Hispanic	Bioengineering
Continuing	Robert	Danatto	African American	Electrical & Computer
Continuing	Jadith	Ziegler	Native American	Microbiology--HSC
Continuing	Sergio	Zegarra	Hispanic	Mechanical Engineering
<u>COHORT 5 – OKLAHOMA STATE UNIVERSITY</u>				
Continuing	Arscott	RaiAnna	African American	Chemistry
Continuing	Bryant	Nicole	Native American	Botany
Continuing	Butson	Eric	Native American	Chemistry
M.S.	King	Jamere	African American	Engineering
M.S.-continuing	Lamkin	Darren	African American	Engineering
M.S.-continuing	McCloud	Josh	Native American	Botany
M.S.	Parkhurst	Molly	First Gen-White	Botany

Transferred	Rice	Marissa	African American	Zoology
Continuing	Ross	Joseph	Native American	Physics
Expected Ph.D. 2015	Supeck	David	Native American	Biochemistry
M.S.	Tehrani	Ana	Hispanic	Statistics
M.S.	Williams	CJ	African American	Engineering
Continuing	Jones	Bill	Native American	Plant & Soil

COHORT 4 – THE UNIVERSITY OF OKLAHOMA

Left program No degree	Aguayo	Chris	Hispanic	Aerospace Engineering
M.S. continuing	Atkinson	Brittanie	African American	Biochemistry-Gpibs
Continuing	Dunn	Zack	Native American	Electrical Engineering
Continuing	Franklin	Mario	African American	Industrial Engineering
M.S.	Herrera	Juan	Hispanic	Electrical Engineering
M.S.-continuing	Jordan	Lorne	African American	Biochemistry
M.S.	Jordan	Ryan	Native American	Geology
Continuing	Kimmel	Jason	Cauc-First Gen	Electrical Engineering
Continuing	Liles	Meghan	Native American	Biochemistry-Gpibs
M.S.	Mace	Chris	Native American	Geology
Transferred Non-STEM	McAndrews	Chrystle	Native American	Botany Microbiology
M.S.	Ong	Shawna	Pacific Islander	Electrical Engineering
Continuing	Watley	Ryan	African American	Chemistry

COHORT 3 – OKLAHOMA STATE UNIVERSITY

M.S.	Benjamin	Marcus	African American	Chemistry
M.S.-continuing	Blocker	Tomica	African American	Zoology
M.S.-continuing	Carpenter	Zachary	Native American	Electrical & Computer Engr
PH.D.- 2014	Fine	Scott	Native American	Plant & Soil Science
M.S.	Gonzales	Erik	Hispanic	Physics
Expected Ph.D. 2015	Gonzales	Jonathan	Hispanic	Electrical & Computer Engr.
M.S.	Hough	Matthew	Native American	Plant & Soil Science
M.S.	Hughes	Shawna	African American	Food Sciences
M.S.	Ngo	Minh	Asian/First Gen	Forensics
Left program No degree	Osei	Richard	African American	Computer Science
M.S.	Parkhurst	Molly	Cauc-First Gen	Botany
Expected Ph.D. 2015	Pinkerman	Cody	Native American	Aerospace & Mechanical Engineering
M.S.	Yarholar	Doug	Native American	Civil Engineering

COHORT 2 – THE UNIVERSITY OF OKLAHOMA

M.S.	De la Cruz	Felix	Hispanic	Mechanical Engineering
Ph.D.- 2011 Expected	Harris	Steven	African American	Chemistry
Ph.D. 2015 Expected	Harvey	Desmond	African American	Industrial Engineering
Ph.D. 2015	Henderson	Jacob	Native American	Electrical Engineering
Ph.D.- 2011 Expected	Hughes	Quintin	African American	Industrial Engineering
Ph.D. 2015	James	Kevin	African American	Electrical Engineering
M.S. Left program No degree	McCarroll	Shawn	Native American	Computer Science
	McCutchen	Marshall	Native American	Physics
M.S.	Osisanya	Israel	African American	Chemical Engineering
Transferred	Rowland	Marquita	African American	Biology
M.S. Left program No degree	Vazquez	William	Hispanic	Mathematics
	Wallace	T'Aire	African American	Microbiology

COHORT 1 – OKLAHOMA STATE UNIVERSITY

M.S.	Barrett	Dominic	Native American	Natural Resource Ecology
Ph.D. -2007 Expected	Cowan	Brett	Native American	Civil Engineering
Ph.D. 2015	CowanWatts	Cara	Native American	Biosystems Engineering
M.S.	Heppler	Marty	Native American	Entomology
Ph.D. -2012	Manjarrez	Jacob	Hispanic	Biochemistry
M.S.	Patton	Thomas	Native American	Mechanical Engineering
Ph.D. -2011 Left program No degree	Peal	Lila	African American	Biochemistry
	Rush	Loretta	Native American	Plant Pathology
M.S.	Sherman	Adrienne	African American	Environmental Science
				Toxicology-Veterinary
M.S.	Singleton	Nicole	African American	Biomedical Sciences
Ph.D.-2011	Wilkins	Brek	Native American	Biomedical Sciences
Pharm D	Wright	Cristee	African American	Microbiology

OKLAHOMA STATE UNIVERSITY – COHORT VII



OKLAHOMA STATE UNIVERSITY

Bridge to the Doctorate Program



Update - August 2014



Jason F. Kirksey, PhD
 PI/Program Director
 Associate VP Institutional Diversity
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Kay Porter, Program Manager/BD Coordinator
Fara Williams, Data Manager

405-744-6710
405-744-7820

Oklahoma State University (OSU), founded in 1890, is a comprehensive land-grant institution that provides exceptional academic experiences, scholarly research and other creative activities that advance fundamental knowledge. With its main campus in Stillwater, OSU is Oklahoma's only university with a statewide presence. Total system-wide enrollment from all five campuses is approximately 32,500. The institution is a state leader in research, with a focus on sensors and sensor technology, information technology, Homeland Security issues, biotechnology and nanotechnology. More than 170 graduate programs and options are offered, including 110 at the master's level and 60 at the doctoral level.

 <p>Allison Sherier BS Institution: Oklahoma State University Major: Forensic Sciences</p>	 <p>Blair Baldrige BS Institution: Oklahoma State University Major: Electrical & Computer Engineering</p>	 <p>Brandon Burgess BS Institution: Oklahoma State University Major: Plant & Soil Sciences</p>
 <p>Brice Fiddler BS Institution: Oklahoma State University Major: Civil Engineering</p>	 <p>Greg Cook BS Institution: Cameron University Major: Biomedical Sciences</p>	 <p>Jeremy Hall BS Institution: Oklahoma State University Major: Electrical & Computer Engineering</p>
 <p>Jorge Lightfoot BS Institution: University of Illinois Major: Biology</p>	 <p>Joseph Dyer BS Institution: Southeastern Oklahoma State University Major: Natural Resources and Ecology Management</p>	 <p>Liz Zehren BS Institution: East Central University Major: Medical Physics</p>
 <p>Milecia Matthews BS Institution: Oklahoma State University Major: Mechanical Engineering</p>	 <p>Shelby Fraser BS Institution: Southeastern Oklahoma State University Major: Natural Resources and Ecology Management</p>	 <p>Sunny Evans BS Institution: Oklahoma State University Major: Entomology</p>

UNIVERSITY OF OKLAHOMA – COHORT VI

THE UNIVERSITY OF OKLAHOMA



Bridge to the Doctorate Program



Susan Walden PhD
 Cohort VI Co-PI
 University of Oklahoma
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 PI/ Program Director
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Created by the Oklahoma Territorial Legislature in 1890, the University of Oklahoma is a doctoral degree-granting research university serving the educational, cultural, economic, and health-care needs of the state, region, and nation. The Norman campus serves as home to all of the university's academic programs except health-related fields. Both the Norman and Health Sciences Center colleges offer programs at the Schusterman Center, the site of OU-Tulsa. The OU Health Sciences Center, which is located in Oklahoma City, is one of only four comprehensive academic health centers in the nation with seven professional colleges. The University of Oklahoma enrolls more than 30,000 students, has more than 2,400 full-time faculty members, and has 20 colleges offering 158 majors at the baccalaureate level, 167 majors at the masters level, 81 majors at the doctoral/professional level, and 24 graduate certificates.



Christina Bruxvoort
 BS Institution: University
 Central Oklahoma
 Major: Biochemistry



Daniel Dixon
 BS Institution: Oklahoma
 State University
 Major: Chemical
 Engineering



Jared Giem
 BS Institution: East Central
 University
 Major: Medical Physics



Josh Hardisty
 BS Institution: University
 of Oklahoma
 Major: Geophysics



Kayla Love
 BS Institution: Langston
 University
 Major: Biochemistry



Alex Moreno
 BS Institution: University of
 Oklahoma
 Major: Electrical
 Engineering



Abigail Ntneh
 BS Institution:
 Southwestern Oklahoma
 State University
 Major: Biochemistry



Allison Quiroga
 BS Institution: University of
 Oklahoma
 Major: Civil Engineering



Cortes Williams
 BS Institution: University of
 Oklahoma
 Major: Bioengineering



Robert Donatto
 BS Institution: University
 of South Florida
 Major: Electrical &
 Computer Engineering



Jadith Ziegler
 BS Institution: Cameron
 University
 Major: Microbiology



Sergio Zagarra Cabelo
 BS Institution: University of
 Oklahoma
 Major: Mechanical
 Engineering

OKLAHOMA STATE UNIVERSITY – COHORT V

OKLAHOMA LSAMP

BRIDGE TO THE DOCTORATE 2011 COHORT V

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ERIC BUTSON
Northeastern State University, 2012
BS, Chemistry
BD Emphasis: Chemistry
Career Goals: To conduct research at a national lab and eventually teach college chemistry to motivate students to go into chemistry.



JEAN VAN DELINDER, PH.D.
Oklahoma State University
Principal Investigator
Oklahoma Louis Stokes Alliance for
Minority Participation



JAMERE KING
Southwestern Oklahoma State University, 2012
BS, Computer Engineering Technology
BD Emphasis: Computer Engineering
Career Goals: To become a Chief Information Security Officer & Chief Information Officer.



JOSH MCLOUD
Oklahoma State University, 2012
BS, Biological Sciences
BD Emphasis: Botany & Microbiology
Career Goals: To become a professor in order to continue conducting research as well as encourage and mentor minority students.



DAVID SUPECK
Southwestern Oklahoma State University, 2008
BS, Chemistry & Physics
BD Emphasis: Immunology & Biochemistry
Career Goals: To have a career in industry and become a research professor.



MOLLY PARKHURST
Oklahoma State University, 2010
BS, Botany; MS, Botany
BD Emphasis: Plant Science
Career Goals: To become a research scientist with a federal agency such as the USDA, FDA, or EPA with a focus on genetically modified organisms.



CHARLES "CJ" WILLIAMS JR.
Oklahoma State University, 2012
BS, Computer Engineering
BD Emphasis: Industrial Engineering Management
Career Goals: To pursue a project management position with a Fortune 500 company.



RAIANNA ARSCOTT
Texas Southern University, 2011
BS, Chemistry
BD Emphasis: Chemistry
Career Goals: To help people by unraveling causes and exacting cures for cancer, pulmonary, neurological, and autoimmune diseases.



ANA TEHRANI
University of Central Oklahoma, 2012
BS, Mathematics & Statistics
BD Emphasis: Statistics
Career Goals: To become an ethical researcher and to keep current with new material and technology.



JOSEPH ROSS
East Central University, 2009
BS, Medical Physics
BD Emphasis: Medical Physics
Career Goals: To participate in clinical service by performing treatment planning for patients according to the treatment regimen prescribed by the Radiation Oncologist.

Oklahoma State University is a multi-campus public land grant educational system, founded in 1890, that is dedicated to improving the lives of people in Oklahoma, the nation, and the world through integrated, high-quality teaching, research, and outreach. The instructional mission includes undergraduate, graduate, technical, extension, and continuing education informed by scholarship and research. The research, scholarship, and creative activities promote human and economic development through the expansion of knowledge and its application. OSU can boast: (1) being named as one of the "Best Value" colleges by the Princeton Review; (2) a Truman Honor Institution; (3) College of Engineering renowned in the fields of architecture and mechanical engineering; (4) the Center for Health Sciences educates osteopathic physicians, research scientists, and other health care professionals with an emphasis on serving rural and under-served Oklahomans; (5) the Forensic Sciences program is one of only eight in the nation accredited by the Forensic Science Education Program Accreditation Commission; (6) the Biomedical Sciences program offers advanced degrees in anatomy, biochemistry, cell biology, microbiology, pathology, pharmacology, and physiology; (7) dedicated to educating students to be life-long learners and ethically prepared to serve and lead in an increasingly complex global society; (8) a leader in research, the Wentz Foundation program offers a unique undergraduate research scholarship that allows students to develop their own projects in university labs; (9) has state-of-the-art research facilities and equipment, along with talented faculty, and (10) awards more degrees to Native Americans than any other institution in the nation.



DARRON "DJ" LAMKIN
Oklahoma State University, 2010
BS, Mechanical Engineering Technology; MS, Industrial Engineering
BD Emphasis: Industrial Engineering
Career Goals: To become a Manufacturing Engineer and to encourage minority students to seek engineering degrees and careers.



NICOLE BRYANT
Oklahoma State University, 2011
BS, Botany
BD Emphasis: Botany
Career Goals: To become a Plant Pathology & Genetics professor.



MARISSA RICE
Virginia Tech, 2011
BS, Biological Sciences
BD Emphasis: Zoology
Career Goals: To make significant contributions to the fields of ecology, evolution, and behavior and to be a distinguished professor in her field.

APPENDIX S

EVALUATION REPORT



The University of Oklahoma
CENTER FOR INSTITUTIONAL DATA EXCHANGE AND ANALYSIS (C-IDEA)

September 8, 2014

Jason F. Kirksey, Ph.D.
PI/Program Director, OK-LSAMP
Associate Vice President of Institutional Diversity
Oklahoma State University
406 Whitehurst Hall
Stillwater, OK 74078

Dear Dr. Kirksey:

Congratulations on a successful year for the Oklahoma Louis Stokes Alliance for Minority Participation program. The OK-LSAMP program has experienced consistent success in developing minority students who graduate with STEM degrees and continue to graduate school.

The attached evaluation examines the Alliance activities during the period of Summer 2013 through Spring 2014. The evaluation is based on the latest data that was available to us at the time we began our analysis in order to meet the deadline. Our data includes 217 participants in the OK-LSAMP program. Based on new and updated data from several of the partner institutions, some updates were made to the OK-LSAMP master database after that time. As a result, there is a discrepancy in the total number of participants which we report (217) and the total number recorded by the OK-LSAMP office (257).

The Alliance has exceeded its goal to increase by 25% (5% per year) the number of underrepresented minority (URM) students graduating in STEM fields over the life of the project. Based on the data used in this evaluation, the Alliance increased by 16% the number of OK-LSAMP students who graduated with STEM degrees as compared to the previous evaluation period. In addition, 46% of the graduates included in this evaluation were accepted into graduate school.

The OK-LSAMP institutions are helping to develop strong candidates for graduate school. Many of the students are participating in research during the academic year, as well as completing summer internships. Of the 158 juniors and seniors included in the evaluation, 61% participated in research during the academic year, and 63% completed at least one summer internship while participating in the program. These internships include experiences at organizations and higher education institutions including Harvard University, Georgia Institute of Technology, Michigan State University, Ohio State University, UMB Financial Corporation, Conoco Phillips, Exxon Mobil, Chesapeake Energy, Chevron Corporation, Toyota, and the Boeing Company. In addition, 81% of the graduates had a GPA of 3.0 or higher, and 79% of the seniors remaining in the program met this benchmark as well.

The national data that our office published in the August 2014 CSRDE STEM Retention Report shows that 29.9% of the underrepresented minority students who began college as a STEM major graduated with a STEM degree. However, this evaluation shows that if a student is actively participating in the OK-LSAMP program during their junior and senior years, the likelihood that the student will graduate in a STEM field is excellent. The data in this OK-LSAMP evaluation indicates that 99% of the participants who were juniors or non-graduating seniors in spring 2013 returned for the fall 2013 semester. The Alliance is to be congratulated for this remarkable success.

This evaluation includes a summary of the activities of the individual Alliance partners and is included as an appendix in the report. Kay Porter and Fara Williams have been very helpful in providing data and answering any questions needed to complete the report.

Finally, there are two recommendations for improvement included in the evaluation report.
Continue institutional support for retaining students in the first two years
Increase the number of seniors taking the GRE and applying to graduate school

Thank you for the opportunity to participate in the Alliance as the evaluator. Please let me know if you have any questions.

Sincerely,

A handwritten signature in cursive script that reads "Sandra Whalen".

Sandra Whalen
OK-LSAMP Program Evaluator

Introduction

The Oklahoma Louis Stokes Alliance for Minority Participation has realized continued success in developing minority graduates in the STEM fields. In recent years, the Alliance has focused attention not only on increasing college STEM graduates, but also the number of graduates who continue to graduate school.

In this Phase IV project, the Alliance accepted the following challenge:

- ***To increase by 25% the number of underrepresented minority (URM) students graduating in STEM fields over the life of this project (i.e. Recruit and retain a minimum of 5% increase yearly in the number of eligible students).*** The ultimate goal is that these students will not only graduate from college with a STEM degree, but also be eligible for acceptance into graduate school.

The Alliance is dedicated to providing academic, personal, and professional support for its students to help them excel in STEM fields. This report examines the ability of the Alliance to achieve its goals during the period of the summer of 2013 through spring 2014. The program is specifically recruiting underrepresented minority (URM) students – Blacks, American Indians, and Hispanics – but students of other race/ethnicities may also participate. The breakdown by race/ethnicity and class standing of students who participated during this period can be seen below in Table 1.

Table 1: *Class Standing and Ethnicity – Summer 2013 through Spring 2014*

Standing	URM	Other	Total
Freshman	1	1	2
Sophomore	29	4	33
Junior	41	3	44
Senior	114	24	138
TOTAL	185	32	217

In the program year under review the Alliance supported 217 students: 138 seniors, 44 juniors, 33 sophomores, and 2 freshmen. Of these participants, 185 (85%) were underrepresented minority students. Participation of students by class standing and institution is displayed in Table 2.

Table 2: *Participants by Partner Institution – Summer 2013 through Spring 2014*

Institution	Freshman	Sophomore	Junior	Senior	Total
Cameron	0	0	3	9	12
East Central	0	3	1	13	17
Langston	0	5	8	14	27
Northeastern	0	0	1	6	7
Northwestern	0	3	3	1	7
Oklahoma State	2	15	20	55	92
Southeastern	0	2	2	6	10
Southwestern	0	0	2	4	6
U of Central OK	0	3	2	6	11
U of Oklahoma	0	1	1	19	21
U of Tulsa	0	1	1	5	7
TOTAL	2	33	44	138	217

The resources of the Alliance have primarily been focused on supporting juniors and seniors during this phase; however, in keeping with the institutional commitments for recruiting and developing students, the Alliance has continued to reach out to freshman and sophomore students as well. For the purposes of this review, the focus will be on the junior and senior students.

A total of 152 juniors and seniors participated in the previous evaluation while 182 participated this year. This represents a 20% increase in the participation of upperclassmen during the 2013-14 program year.

Alliance Wide Goals

The OK-LSAMP program proposed to significantly increase the number of targeted students entering into graduate programs over the five years of this project, preferably to earn doctorates. To this end, the goal of the Alliance over the course of the grant was to have a minimum of 25% of the available baccalaureate degree graduates eligible for graduate school admission and subsequently enrollment.

In order to maximize the success of students that apply to graduate school, the Alliance determined that it would strive to assist students in accomplishing the following tasks:

- Achieve a minimum 3.0 GPA
- Complete two full summer internships
- Attend annual presentations of research
- Take the GRE by fall of senior year
- Take research ethics training
- Attend international/global training and cultural experiences

Graduate School Eligibility Goal Achieved

The Alliance has met the goal of increasing by 5% annually the number of students who have achieved a baccalaureate degree in a STEM field and are eligible for graduate school admission and subsequently enrollment. The Alliance is meeting its goals whether it is examined from headcounts or percentages.

Over the course of the evaluation period the Alliance increased by 16% the number of students who graduated with STEM degrees as compared with the previous evaluation period. Of the 59 students who graduated with a STEM degree during the 2013-14 review period, 46% (27 students) were accepted into graduate school. Moreover, the GPAs, internships, and research experience of the group demonstrates that there were other students that graduated who had the potential to move on to graduate STEM work. We know that several graduates chose to enter the workforce rather than attend graduate school, although they were capable of pursuing a graduate degree. Some of the companies offer to pay for graduate school as part of their benefits package. Although these students are not included in some of the data below, the Evaluator believes that the success of these students is also a reflection of the work of the Alliance.

The OK-LSAMP graduates accomplished the following:

- 43% (59 of 138) of the OK-LSAMP seniors graduated during this period with the rest continuing their studies
- 5% (3 of 59) of the graduates had taken the GRE by the Fall of 2013
- 8% (5 of 59) of the graduates had taken the GRE by the Spring 2014
- 81% (48 of 59) of all graduates had a GPA of 3.0 or higher
- 93% (55 of 59) of all graduates had at least one full summer internship
- 56% (33 of 59) of all graduates had at least two full summer internships

The GRE data from several Alliance institutions appears to be incomplete in the data used to prepare this report; therefore, the Evaluator believes the low percentages of graduates who took the GRE may not be an accurate representation of the efforts of the OK-LSAMP students.

The Continuing Development of Students

Research is a significant component of the OK-LSAMP program. It provides an opportunity to develop research skills and build relationships with faculty members. In addition, it is believed that research can help improve admissions eligibility for those students seeking a graduate degree. OK-LSAMP participants are encouraged to apply to graduate school. Typically, an application and GRE scores are required for admission in most programs. Below are the results of the Alliance-wide efforts in providing opportunities for the participants to be successful in their graduate school applications.

- 59% (89 of 152) of the fall 2013 students participated in research
- 57% (90 of 158) of the spring 2014 students participated in research
- 67% (79 of 118) of students in the program through summer 2013 were in summer 2013 internships
- 31% (28 of 91) continuing, non-graduating, spring 2014 students were scheduled for summer 2014 internships

- 24% (14 of 59) of all graduates made graduate applications
- 46% (27 of 59) of all graduates were admitted to graduate school

As with the GRE data, the data for graduates who made applications to graduate school was not provided by some of the Alliance institutions. As a result, the percentage of students who were admitted to graduate school is greater than those who applied to graduate school, as noted above.

Summaries on how each individual Alliance partner contributed to these goals can be found within the institutional summaries at the end of the report.

The National STEM Retention and Graduation Data

In August 2014, the Consortium for Student Retention Data Exchange published the annual national STEM retention study, *2013-14 CSRDE STEM Retention Report*. This report is based on survey data collected from 177 colleges and universities. In past years data for each of the Oklahoma public institutions were provided for the annual STEM report by the Oklahoma State Regents for Higher Education. The Regents did not submit the data for this reporting period; however, data for Oklahoma State University, The University of Oklahoma, and The University of Central Oklahoma were submitted directly from the institutions and were included in the national report.

The survey data were collected on first-time, full-time, baccalaureate degree-seeking freshman cohorts of 2003 through 2012 who indicated intent to major in a STEM field. The Classification of Instructional Programs (CIP) codes used to identify the majors were selected in cooperation with the National Science Foundation when this survey was developed in the late 1990s, and have been updated periodically over the past two decades. In capturing the retention and graduation rates of these STEM students, we used the following approach. First, we collected the retention and graduation rates of these STEM cohorts in any major at their institution. If students initially indicated an interest in majoring in a STEM discipline, but later changed their major to a non-STEM field, they were included in this section of the survey, along with those students who remained in the STEM majors. Next, the survey captured the rates at which the cohorts continued and graduated within STEM fields at their institution. This dual tracking allows us to see within a campus the migration of STEM majors out of STEM fields and into other majors. It also allows us to see the general departure rate of students.

The CSRDE also publishes an annual national retention report that provides data on all first-time, full-time, baccalaureate degree-seeking students, regardless of major. The following summary provides the status of STEM retention and graduation data as well as retention and graduation data of all first-time students at the 177 institutions, regardless of major, observed in the 2013-14 CSRDE retention reports. It includes the data from Oklahoma State University, The University of Oklahoma, and The University of Central Oklahoma.

Graduation Rates

In the following discussion, three types of graduation rates are provided for the Total cohorts and the URM cohorts:

All Majors – All Majors identifies the percent of first-time, full-time students who began and graduated within six years in all majors at their institution.

Any Major - Any Major identifies the percent of students who began as freshman STEM majors and graduated within six years in any major at their institution.

STEM Major - STEM Major identifies the percent of students who began as freshman STEM majors and graduated within six years specifically within a STEM field at their institution.

In Table 3 below, the six-year graduation rates are provided for the 2007 cohorts of all students in the national study as well as OU, OSU, and UCO. The data for underrepresented minority students are shown as well.

Table 3: Six-year Graduation Rates – 2007 Total and URM Cohorts

Category	Total	URM
All Majors		
National	60.6%	47.6%
OU	66.3%	59.0%
OSU	60.2%	51.6%
UCO	35.6%	29.3%
Any Major		
National	63.9%	49.5%
OU	66.1%	57.5%
OSU	64.3%	55.0%
UCO	31.3%	26.4%
STEM Major		
National	45.5%	29.9%
OU	41.0%	35.4%
OSU	30.2%	29.3%
UCO	13.1%	5.7%

In order to have a better understanding of how the three Oklahoma institutions are doing compared to similar institutions nationally, Table 4 below provides the data based on institutional selectivity. The table shows the six-year graduation rates for the following 2007 URM cohorts by selectivity: 1) students in all majors, 2) students who begin as a STEM major and graduate within any major at the institution, and 3) students who begin as a STEM major and graduate within STEM majors. Selectivity as defined in the CSRDE research is a categorization of institutions based on the average ACT or SAT admission test scores of incoming students. The University of Oklahoma and Oklahoma State University are included in the Highly Selective category, and the University of Central Oklahoma is grouped as Moderately Selective.

- *Highly Selective institutions:*
ACT scores above 24.0 or SAT scores above 1100
- *Selective institutions:*
ACT scores from 22.5-24.0 or SAT scores from 1045-1100
- *Moderately Selective institutions:*
ACT scores from 21.0-22.4 or SAT scores from 990-1044
- *Less Selective institutions:*
ACT scores below 21.0 or SAT scores below 990

Table 4: *Six-year Graduation Rates by Selectivity – 2007 URM Cohort*

Category	Highly Selective	Selective	Moderately Selective	Less Selective	All URM
All Majors					
National	62.9%	44.6%	36.8%	36.1%	47.6%
OU	59.0%				
OSU	51.6%				
UCO			29.3%		
Any Major					
National	62.6%	43.4%	33.0%	33.2%	49.5%
OU	57.5%				
OSU	55.0%				
UCO			26.4%		
STEM Major					
National	40.6%	23.3%	13.9%	19.3%	29.9%
OU	35.4%				
OSU	29.3%				
UCO			5.7%		

Table 4 indicates that the graduation rates for underrepresented minority students are positively related to the selectivity of the institution for the cohort of all first-year students, regardless of major (All Majors). More selective institutions have higher URM graduation rates for this group. However, students who began as a STEM major (as noted above as Any Major and STEM Major) graduated at a higher rate from Less Selective institutions than from those classified as Moderately Selective. We also see that a significant number of URM students who began as a STEM major graduated within any major in their institutions, STEM or non-STEM. In the Moderately Selective institutions, including the University of Central Oklahoma, more than half of the underrepresented minority students left the STEM disciplines and graduated in a non-STEM major.

The University of Oklahoma and Oklahoma State University's six-year graduation rates are generally above the average for all URM students; however, when compared to other institutions with similar selectivity, the graduation rates of their URM students are lower. On the other hand, The University of Central Oklahoma's six-year graduation rates are below the average of all URM students in all categories (All majors, Any majors, and STEM majors), within their selectivity group and all URM students in the study.

Table 5 provides the six-year graduation rates for all majors, within any major and within STEM majors for the Total 2007 cohort by selectivity.

Table 5: *Six-year Graduation Rates by Selectivity – 2007 Total Cohort*

Category	Highly Selective	Selective	Moderately Selective	Less Selective	Total
All Majors					
National	71.4%	55.1%	47.0%	42.8%	60.6%
OU	66.3%				
OSU	60.2%				
UCO			35.6%		
Any Major					
National	72.0%	55.6%	46.5%	39.2%	63.9%
OU	66.1%				
OSU	64.3%				
UCO			31.3%		
STEM Major					
National	53.2%	37.8%	27.7%	23.3%	45.5%
OU	41.0%				
OSU	30.2%				
UCO			13.1%		

The results shown in Table 5 indicate that all three Oklahoma universities included in the CSRDE data fall below the national averages for their six-year graduation rate for all students who began as a STEM major and graduated within a STEM discipline. This is true when compared to similar institutions as well as all institutions in the study. However, The University of Oklahoma and Oklahoma State University had generally higher graduation rates than the national average for students in all majors and students who began in a STEM major and graduated in any major within the university.

In both Table 4 and Table 5, the average graduation rates of all students who began college with an intent to graduate in a STEM major, both Total and URM cohorts, are higher than those who began college in any major.

In Figures 1-3 below, the national data for the 2007 URM cohort and the Total cohort are provided for comparison, based on the percentages listed in Tables 4 and 5 above. Figure 1 provides the graduation rates for all students, regardless of their major when they began college. Figure 2 shows the data for students who began as a STEM major at the institution and graduated in any major at the institution. Figure 3 provides the rates for students who began as a STEM major at the institution and graduated within a STEM discipline.

Figure 1: Six-year Graduation Rates by Selectivity – All Majors
2007 Total and URM Cohorts

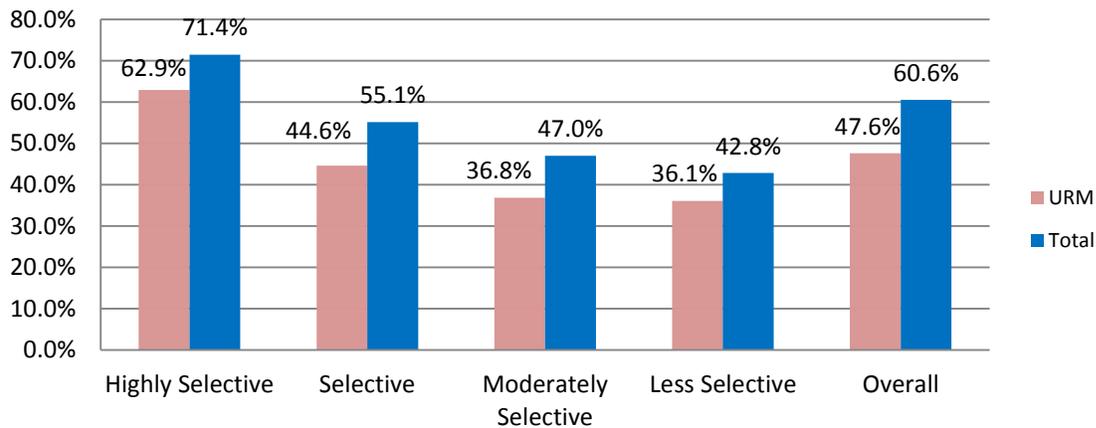


Figure 2: Six-year Graduation Rates by Selectivity – Any Majors
2007 Total and URM Cohorts

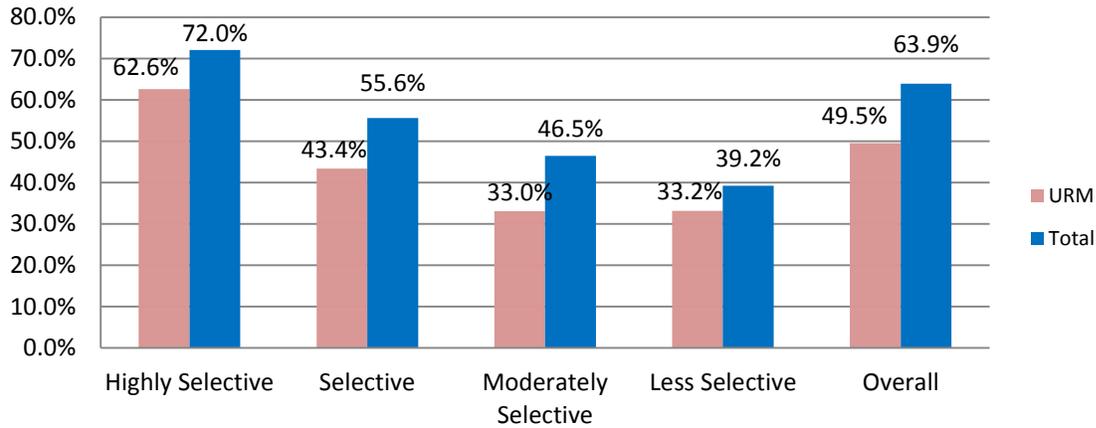
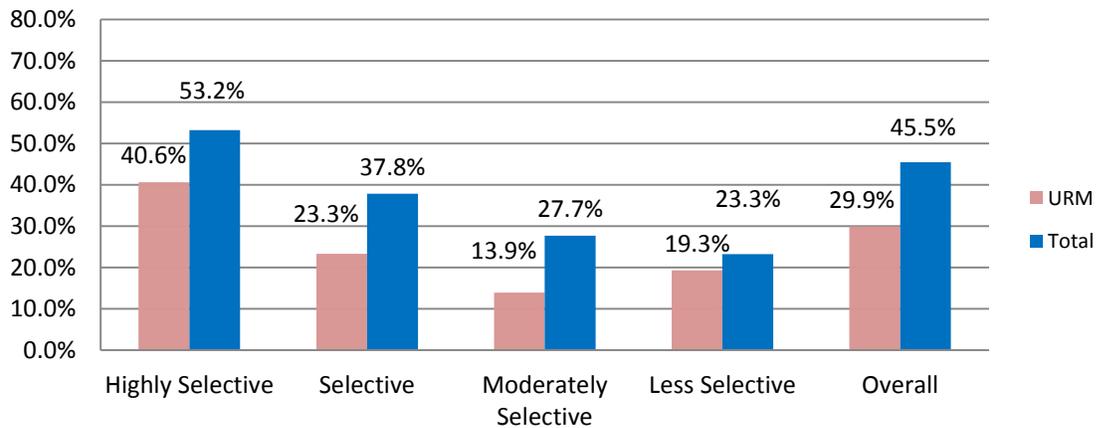


Figure 3: Six-year Graduation Rates by Selectivity – STEM Majors
2007 Total and URM Cohorts



As seen in Tables 4 and 5 and Figures 1-3, the graduation rates of students decrease as the selectivity of the institution decreases. However, for those URM students who began at their institution with the intent to major in a STEM discipline, the Less Selective institutions graduate these students at a higher rate than Moderately Selective institutions. The gap between the graduation rates for URM students and the Total cohort of students is considerable in all institutions, but the difference is smaller within the Less Selective institutions.

Retention Rates

Retention is defined as the rate at which the first-time, full-time fall cohort returns to the institution the following fall. The first year is a critical period in the success of students, and typically this is the point at which departures occur most frequently at most institutions across the country.

In the following discussion using the CSRDE national STEM data, as with the graduation tables, there are three types of retention rates provided for the Total cohorts and the URM cohorts.

- All Majors – All Majors identifies the percent of first-time students who began in all majors and continued to the second academic year at their institution.
- Any Major - Any Major identifies the percent of students who began as freshman STEM majors and continued to the second academic year in any major at their institution.
- STEM Major - STEM Major identifies the percent of students who began as freshman STEM majors and remained specifically within a STEM field at their institution as they moved into their second academic year.

In Table 6, the first-year retention rates are provided for the 2012 cohorts of all students in the national study as well as OU, OSU, and UCO. The data for underrepresented minority students is shown as well.

Table 6, *First-year Retention Rates – 2012 Total and URM Cohorts*

Category	Total	URM
All Majors		
National	82.6%	78.3%
OU	84.0%	79.7%
OSU	78.6%	71.6%
UCO	64.9%	57.5%
Any Major		
National	85.3%	80.3%
OU	85.9%	85.3%
OSU	81.1%	76.5%
UCO	67.3%	58.0%
STEM Major		
National	72.7%	65.7%
OU	67.1%	64.5%
OSU	72.1%	69.4%
UCO	47.1%	38.6%

As with the graduation rates, in order to gain a better understanding of how the three Oklahoma institutions are doing compared to similar institutions nationally, Table 7 provides the retention data based on institutional selectivity. The table shows the first-year retention rates for all majors, within any major and within STEM majors for 2012 URM cohorts by selectivity.

Table 7: *First-year Retention Rates by Selectivity – 2012 URM Cohort*

Category	Highly Selective	Selective	Moderately Selective	Less Selective	All URM
All Majors					
National	85.3%	75.8%	72.4%	74.9%	78.3%
OU	79.7%				
OSU	71.6%				
UCO			57.5%		
Any Major					
National	85.9%	76.8%	74.1%	75.3%	80.3%
OU	85.3%				
OSU	76.5%				
UCO			58.0%		
STEM Major					
National	70.4%	61.5%	58.3%	63.6%	65.7%
OU	64.5%				
OSU	69.4%				
UCO			38.6%		

Table 7 indicates that the retention rates for underrepresented minority students are positively related to the selectivity of the institution for all cohorts of students, regardless of major. Generally, the URM students at more selective the institutions have higher retention rates. However, the URM students at Less Selective institutions are retained at a higher rate than those at Moderately Selective institutions. This is true for all categories, but the gap is larger with the students who began as a STEM major and remained in a STEM discipline.

The University of Oklahoma, Oklahoma State University, and The University of Central Oklahoma’s first-year retention rates are below the average for URM students within their selectivity groups. However, the University of Oklahoma retention rates are higher than the national average for all URM students who begin in all majors, as well as those who begin as a STEM Major and continue in any major at the university.

Table 8 provides the first-year retention rates of the Total 2012 cohort by selectivity for the national data as well as the three Oklahoma institutions that participated in the study.

Table 8: *First-year Retention Rates by Selectivity – 2012 Total Cohort*

Category	Highly Selective	Selective	Moderately Selective	Less Selective	Total
All Majors					
National	88.0%	78.6%	75.5%	75.5%	82.6%
OU	84.0%				
OSU	78.6%				
UCO			64.9%		
Any Major					
National	89.1%	80.5%	77.6%	76.5%	85.3%
OU	85.9%				
OSU	81.1%				
UCO			67.3%		
STEM Major					
National	77.0%	66.7%	63.9%	64.6%	72.7%
OU	67.1%				
OSU	72.1%				
UCO			47.1%		

Tables 7 and 8 show that both URM students and the Total cohort of students who started as a STEM major are more likely to continue their education to the second year as compared to those students who start in any major at the institution, regardless of selectivity. Retention rates of URM students are below the average rate among all races. However, the gap between the retention rates of URM students and the total cohort of students is much smaller for the first-year retention rate than it is for the six-year graduation rate, indicating that more URM students are leaving the STEM disciplines after their second year and before they graduate than the total cohort of students.

In Figures 4-6 below, the national data for the 2012 URM cohort and the Total cohort are provided for comparison, based on the percentages listed in Tables 7 and 8 above. Figure 4 provides the first-year retention rates for all students, regardless of their major when they began college. Figure 5 shows the data for students who began as a STEM major at the institution and returned for their second year in any major at the institution. Figure 6 provides the rates for students who began as a STEM major at the institution and continued to their second year within a STEM discipline.

Figure 4: First-year Retention Rates by Selectivity – All Majors
2012 Total and URM Cohorts

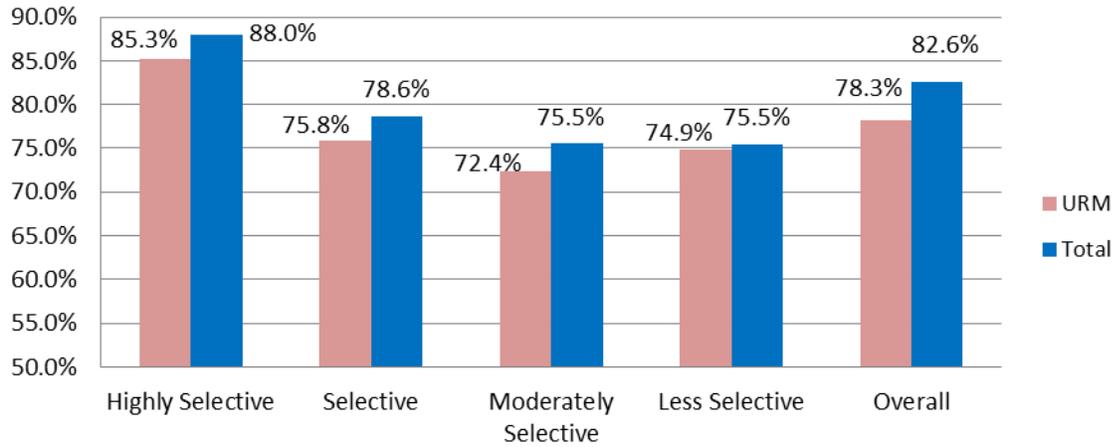


Figure 5: First-year Retention Rates by Selectivity – Any Major
2012 Total and URM Cohorts

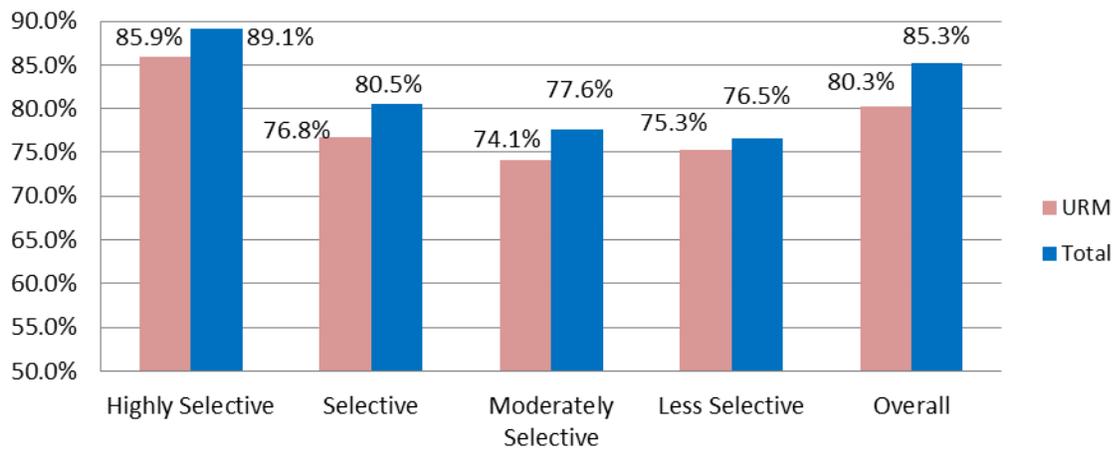
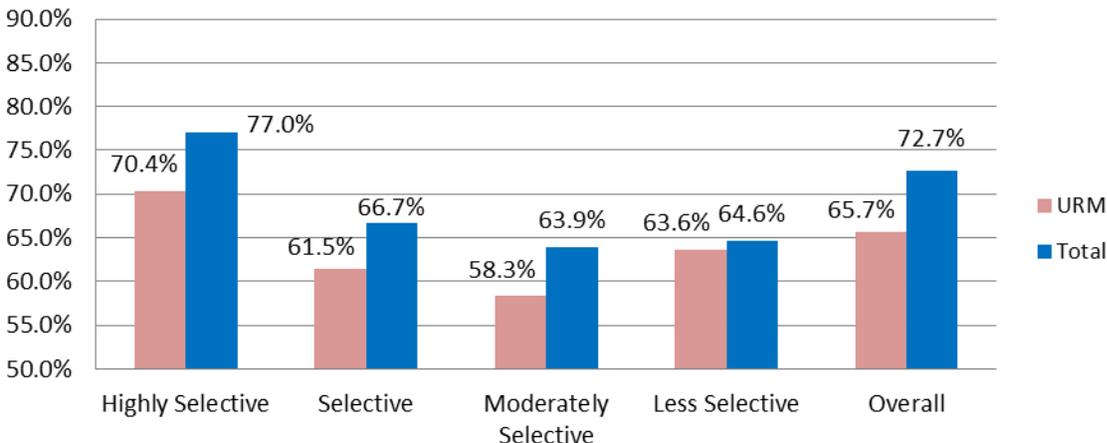


Figure 6: First-year Retention Rates by Selectivity – STEM Majors
2012 Total and URM Cohorts



Providing a comparison between the retention rates of the national freshman cohorts and the retention of students in the OK-LSAMP program is difficult due to the focus on upperclassmen in this project. However, if we look at the retention of the juniors and seniors who were in the OK-LSAMP program in Spring 2013 who continued to Fall 2013, we see that 98% of the students who did not graduate continued in the program the following fall semester. The OK-LSAMP program is having an impact on these students as seen by their spring to fall retention data. The support the OK-LSAMP program provides these students is proven to be effective.

Summary

Over the course of the project, the OK-LSAMP institutions have attempted to support URM students participating in the program as they move through their academic undergraduate careers as STEM majors. Review of the participation data from the OK-LSAMP partners shows that if students are in the program as upperclassmen they most certainly will graduate in a STEM discipline. This evaluation shows that 43% (59 of 138) of the seniors in the OK-LSAMP program graduated during this evaluation period. Additionally, 27 of the 59 graduates, or **46% of participating OK-LSAMP graduates, were identified as having been admitted to graduate school**. This is a testament to the quality of the students and the faculty mentorship they receive in the OK-LSAMP program.

The seniors who did not graduate during the 2013-14 project year appear to be on track to graduation and graduate-school readiness as well. Of the 73 seniors who participated in the program in spring 2014 but did not graduate, 79% (58 of 73) have a GPA of 3.0 or greater. Ten of these students were projected to graduate in summer 2014 or December 2014, and 36 expect to graduate in May 2015.

With respect to the goal of increasing the numbers of URM STEM graduates and graduate admission, the Alliance has been successful. In order to continue to meet its goals, however, the Evaluator would like to provide the following recommendations for consideration.

Recommendation for improvement as the Alliance moves forward

1. Continue institutional support for retaining students in first two years

If a student is actively involved in OK-LSAMP during the junior and senior year, the likelihood of that student graduating in STEM is excellent. The data show that 99% (118 or 119) of the OK-LSAMP students who were juniors or non-graduating seniors in the spring of 2013 returned for fall 2013. This is remarkable and the Alliance is to be commended for this success. The goal is to continue in this path and to increase the number of upperclassmen participating in the program so that the total number of underrepresented minority graduates will increase. Decreasing the departure of students during the freshman and sophomore years will help increase the number of students eligible at the junior and senior level to receive OK-LSAMP support.

The first recommendation is for the institutional leadership at the Alliance institutions to identify ways in which each institution can demonstrate continuing financial support of this program, with a renewed inclusion of support for freshmen and sophomores. Their retention is the key to increasing graduation rates. Given the proven track record of success of this program in producing underrepresented minority STEM graduates, such support is an investment that will produce positive returns.

2. Increase the number of seniors taking the GRE and applying to graduate school

Many graduate programs in STEM fields require the GRE for admission, yet only 15% of the OK-LSAMP graduates participated in the GRE preparation programs during the review period. In addition, only 8% of the graduates had taken the GRE by spring 2014, which is when the majority of them graduated. Twenty-four percent of the graduates completed applications for graduate school. As noted earlier in this report, the GRE and graduate application information from several Alliance institutions appears to be incomplete in the data used for this evaluation, so these percentages noted above may not accurately reflect the efforts of the OK-LSAMP graduates.

OK-LSAMP participants appear to be good candidates for graduate school.

- 81% (48 of 59) of the graduates had a GPA of 3.0 or higher
- 56% (33 of 59) of the graduates had at least two full summer internships
- 41% (24 of 59) of the graduates conducted research

Taking the GRE and applying to graduate school are critical in the efforts to produce more STEM graduates who attend graduate school. It is unclear whether more graduates took the GRE and made more applications than were reported; therefore, it is not possible to determine whether or not these critical steps are being taken by the OK-LSAMP students. It is recommended that the Alliance institutions track more closely these data in an effort to determine their effectiveness in helping their STEM students continue to graduate school.

Conclusion:

In conclusion, overall it can be said that the students who participate in the OK-LSAMP Alliance graduate, and many continue on to graduate school. In addition, the Evaluator is aware of a few graduates who had the ability to attend graduate school but chose to enter the workforce instead

where some will have graduate school opportunities. The OK-LSAMP program has more than met the goals as laid out for this phase. The OK-LSAMP Alliance has supported its students and held them to high standards in terms of grade point averages, research, and internships. As a result, minority students participating in this program have benefited by receiving the support necessary to graduate with the qualifications that open the opportunities for advancing to graduate school.

APPENDIX: Institution-Specific Activities

Below is a summary of activity for each of the OK-LSAMP institutions. For each institution the numbers of participants are identified, and within that number the number of students (juniors and seniors) that were included in the evaluation. Not included in this report is a list of the titles of the papers, presentations, and research projects which the participants completed. This data is available from the Alliance Office at Oklahoma State.

Cameron University

- 12 students were included in this evaluation
- 3 students were juniors and 9 were seniors
- 3 seniors continued from spring 2013; 3 juniors and 2 seniors joined the program in the 2013-14 academic year, including Summer 2013

Support

- 12 out of 12 students (100%) received stipends
- 7 out of 12 students (58%) participated in summer 2013 internships
- 3 out of 4 graduates (75%) participated in at least one summer internship while in the program

Graduate School Preparation

- 6 out of 10 students (60%) who participated in fall 2013 conducted research
- 5 out of 12 students (42%) who participated in spring 2014 conducted research
- 4 out of 4 graduates (100%) had a minimum GPA of 3.0
- 0 out of 4 graduates (0%) took the GRE by the fall of their senior year

Results

- 4 out of 9 seniors (44%) graduated, in May 2014
- 2 out of 4 graduates (50%) were admitted to graduate school

East Central University

- 14 students were included in this evaluation
- 1 student was a junior and 13 were seniors
- 1 junior and 5 seniors continued from spring 2013; 8 seniors joined the program in the 2013-14 academic year, including Summer 2013

Support

- 14 out of 14 students (100%) received stipends
- 2 out of 14 students (14%) participated in summer 2011 internships
- 1 out of 2 graduates (50%) participated in at least one summer internship while in the program.

Graduate School Preparation

- 3 out of 9 students (33%) who participated in fall 2013 conducted research

- 2 out of 11 students (18%) who participated in spring 2014 conducted research
- 2 out of 2 graduates (100%) had a minimum GPA of 3.0
- 0 out of 2 graduates (0%) took the GRE by the fall of their senior year

Results

- 2 out of 13 seniors (15%) graduated, 1 in December 2013, and 1 in May 2014
- 1 out of 2 graduates (50%) were admitted to graduate school

Langston University

- 22 students were included in this evaluation
- 8 students were juniors and 14 were seniors
- 6 juniors and 10 seniors continued from spring 2013; 2 juniors and 4 seniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 22 out of 22 students (100%) received stipends
- 14 out of 22 students (64%) participated in summer 2013 internships
- 8 out of 9 graduates (89%) participated in at least one summer internship while in the program. Five of the graduates participated in 2 or more while in the program

Graduate School Preparation

- 10 out of 22 students (45%) who participated in fall 2013 conducted research
- 8 out of 16 students (50%) who participated in spring 2014 conducted research
- 6 out of 9 graduates (67%) had a minimum GPA of 3.0
- 1 out of 9 graduates (11%) took the GRE by the fall of their senior year

Results

- 9 out of 14 seniors (64%) graduated, in May 2014
- 5 out of 9 graduates (56%) were admitted to graduate school

Northeastern State University

- 7 students were included in this evaluation
- 1 student was a junior and 6 were seniors
- 3 seniors continued from spring 2013; 1 junior and 3 seniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 7 out of 7 students (100%) received stipends
- 2 out of 7 students (29%) participated in summer 2013 internships
- 3 out of 3 graduates (100%) participated in at least one summer internship while in the program. One of the graduates participated in 2 or more while in the program

Graduate School Preparation

- 4 out of 6 students (67%) who participated in fall 2013 conducted research
- 2 out of 4 students (50%) who participated in spring 2014 conducted research
- 3 out of 3 graduates (100%) had a minimum GPA of 3.0
- 0 out of 3 graduates (0%) took the GRE by the fall of their senior year

Results

- 3 out of 6 seniors (50%) graduated, 2 in December 2013, and 1 in May 2014
- 1 out of 3 graduates (33%) was admitted to graduate school

Northwestern Oklahoma State University

- 4 students were included in this evaluation
- 3 students were juniors and 1 was a senior
- 1 senior continued from spring 2013; 3 juniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 4 out of 4 students (100%) received stipends
- 0 out of 4 students (0%) participated in summer 2013 internships
- 0 out of 1 graduate (0%) participated in at least one summer internship while in the program

Graduate School Preparation

- 0 out of 1 student (0%) who participated in fall 2013 conducted research
- 0 out of 3 students (0%) who participated in spring 2014 conducted research
- 1 out of 1 graduate (100%) had a minimum GPA of 3.0
- 0 out of 1 graduate (0%) took the GRE by the fall of their senior year

Results

- 1 out of 1 senior (100%) graduated in December 2013
- 0 out of 1 graduate (0%) was admitted to graduate school

Oklahoma State University

- 75 students were included in this evaluation
- 20 students were juniors and 55 were seniors
- 11 juniors and 39 seniors continued from spring 2013; 9 juniors and 16 seniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 75 out of 75 students (100%) received stipends
- 40 out of 75 students (53%) participated in summer 2013 internships
- 20 out of 23 graduates (87%) participated in at least one summer internship while in the program. Thirteen of the graduates participated in 2 or more during the program.

Graduate School Preparation

- 36 out of 64 students (56%) who participated in fall 2013 conducted research
- 39 out of 69 students (57%) who participated in spring 2014 conducted research
- 17 out of 23 graduates (74%) had a minimum GPA of 3.0
- 1 out of 23 graduates (4%) took the GRE by the fall of their senior year

Results

- 23 out of 55 seniors (42%) graduated, 3 in December 2013 and 20 in May 2014
- 11 out of 23 graduates (48%) were admitted to graduate school

Southeastern Oklahoma State University

- 8 students were included in this evaluation
- 2 students were juniors and 6 were seniors
- 6 seniors continued from spring 2013; 2 juniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 8 out of 8 students (100%) received stipends
- 6 out of 8 students (75%) participated in summer 2013 internships

- 5 out of 5 graduates (100%) participated in at least one summer internship while in the program. Four of the graduates participated in 2 or more while in the program

Graduate School Preparation

- 6 out of 7 students (86%) who participated in fall 2013 conducted research
- 4 out of 5 students (80%) who participated in spring 2014 conducted research
- 4 out of 5 graduates (80%) had a minimum GPA of 3.0
- 0 out of 5 graduates (0%) took the GRE by the fall of their senior year

Results

- 5 out of 6 seniors (83%) graduated, 2 in December 2013 and 3 in May 2014
- 0 out of 6 graduates (0%) was admitted to graduate school

Southwestern Oklahoma State University

- 6 students were included in this evaluation
- 2 students were juniors and 4 were seniors
- 1 junior and 3 seniors continued from spring 2013; 1 junior and 1 senior joined the program in the 2013-14 academic year, including summer 2013

Support

- 6 out of 6 students (100%) received stipends
- 3 out of 6 students (50%) participated in summer 2013 internships
- 1 out of 1 graduate (100%) participated in at least one summer internship while in the program. The graduate participated in 2 or more while in the program

Graduate School Preparation

- 4 out of 6 students (67%) who participated in fall 2013 conducted research
- 5 out of 6 students (83%) who participated in spring 2014 conducted research
- 1 out of 1 graduate (100%) had a minimum GPA of 3.0
- 0 out of 1 graduate (0%) took the GRE by the fall of their senior year

Results

- 1 out of 4 seniors (25%) graduated, in May 2014
- 0 out of 1 graduate (0%) was admitted to graduate school

University of Central Oklahoma

- 8 students were included in this evaluation
- 2 students were juniors and 6 were seniors
- 1 junior and 4 seniors continued from spring 2013; 1 junior and 2 seniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 8 out of 8 students (100%) received stipends
- 3 out of 8 students (38%) participated in summer 2013 internships
- 1 out of 1 graduate (100%) participated in at least one summer internship while in the program. The graduate participated in 2 or more while in the program

Graduate School Preparation

- 7 out of 7 students (100%) who participated in fall 2013 conducted research
- 8 out of 8 students (100%) who participated in spring 2014 conducted research
- 1 out of 1 graduate (100%) had a minimum GPA of 3.0
- 0 out of 1 graduate (0%) took the GRE by the fall of their senior year

Results

- 1 out of 6 seniors (17%) graduated, in May 2014
- 0 out of 1 graduate (0%) was admitted to graduate school

University of Oklahoma

- 20 students were included in this evaluation
- 1 student was a junior and 19 were seniors
- 13 seniors continued from spring 2013; 1 junior and 6 seniors joined the program in the 2013-14 academic year, including summer 2013

Support

- 13 out of 20 students (65%) received stipends
- 11 out of 20 students (55%) participated in summer 2013 internships
- 6 out of 7 graduates (86%) participated in at least one summer internship while in the program. Three of the graduates participated in 2 or more while in the program

Graduate School Preparation

- 8 out of 15 students (53%) who participated in fall 2013 conducted research
- 12 out of 19 students (63%) who participated in spring 2014 conducted research
- 7 out of 7 graduates (100%) had a minimum GPA of 3.0
- 0 out of 7 graduates (0%) took the GRE by the fall of their senior year

Results

- 7 out of 19 seniors (37%) graduated, 1 in December 2013 and 6 in May 2014
- 5 out of 7 graduates (71%) were admitted to graduate school

University of Tulsa

- 6 students were included in this evaluation
- 1 student was a junior and 5 were seniors
- 1 junior and 5 seniors continued from spring 2013

Support

- 6 out of 6 students (100%) received stipends
- 6 out of 6 students (100%) participated in summer 2013 internships
- 3 out of 3 graduates (100%) participated in at least one summer internship while in the program. One of the graduates participated in 2 or more while in the program

Graduate School Preparation

- 5 out of 5 students (100%) who participated in fall 2013 conducted research
- 5 out of 5 students (100%) who participated in spring 2014 conducted research
- 2 out of 3 graduates (67%) had a minimum GPA of 3.0
- 1 out of 3 graduates (33%) took the GRE by the fall of their senior year

Results

- 3 out of 5 seniors (60%) graduated, one in August 2013 and two in May 2014
- 2 out of 3 graduates (67%) were admitted to graduate school

APPENDIX T

SCHOLARS BY INSTITUTION

Institution of Bachelors	First Name	Last Name
Cameron University	Kenesha	Fairley
Cameron University	Jessica	Gesell
Cameron University	Jennifer	Gonce
Cameron University	Jennifer	Green
Cameron University	Elizabeth	Krause
Cameron University	Roosevelt	Matthews
Cameron University	Melissa	Merrieffield
Cameron University	Alaxander	Rivas
Cameron University	Natalie	Ruizcastillo
Cameron University	Ralph	Saunders
Cameron University	John	Whitlow
Cameron University	Jadith	Ziegler
East Central University	Alexandria	Apala
East Central University	Elizabeth	Apala
East Central University	Laura	Asaro
East Central University	Shundin	Bohan
East Central University	Tanya	Chapman
East Central University	Micah	Cheatwood
East Central University	Joshua	Crittenden
East Central University	John	Dale
East Central University	Luvey	Deatherage
East Central University	Lessa	Estrada
East Central University	Michael	Frederickson
East Central University	Michelle	Hyden
East Central University	Casey	Lloyd
East Central University	Karen	Myers
East Central University	Nikolas	Razo
East Central University	Landon	Rodriguez
East Central University	Damon	Sprouts
East Central University	Linzi	Thompson
East Central University	Chase	Tillar
Langston University	Jasmene	Abernathy
Langston University	Keonna	Battle
Langston University	Megan	Bowlin
Langston University	Deborah	Bowman
Langston University	Jazekka	Brewer
Langston University	Ashley	Brown

Langston University	Shanel	Byron
Langston University	Evann	Comeaux
Langston University	Lindsay	Davis
Langston University	Eugene	DeLoach
Langston University	Taylor	Dismuke
Langston University	Joseph	Fields
Langston University	Amber	German
Langston University	Staci	Gleen
Langston University	Tiffany	Glover
Langston University	Rashad	Hall
Langston University	Katerias	Hill
Langston University	Leslie	Hunter
Langston University	Morgan	James
Langston University	Ryan	Johnson
Langston University	Mary	Jordan
Langston University	Alexus	Mason
Langston University	Martel	McKinney
Langston University	Njemile	Miro
Langston University	Jordan	Moore
Langston University	Amanda	Morales
Langston University	Nicole	Newman
Langston University	Candice	Pawnee
Langston University	Kellyn	Pollard
Langston University	Denzel	Pugh
Langston University	Cari	Quick
Langston University	Tiease	Rand
Langston University	Jodeci	Ross
Langston University	Rajah	Singh
Langston University	Jazmenn	Smith
Langston University	Laurence	Smith
Langston University	Britani	Vann
Langston University	Quinten	Walker
Langston University	Gabrielle	Williams
Langston University	Danielle	Wright

Northeastern State University	Brianna	Broad
Northeastern State University	Kelsey	Dozier
Northeastern State University	Garrett	Hood
Northeastern State University	Luther	Langston
Northeastern State University	Tyler	Littlefield

Northeastern State University	Lauren	Lowe-Thompson
Northeastern State University	Nicholas	Martin
Northeastern State University	Alejandra	Mera
Northeastern State University	John	Moore
Northwestern OSU	Willow	Gahr
Northwestern OSU	Jayson	Lee
Northwestern OSU	Angelo	Majike
Northwestern OSU	Aaron	Manning
Northwestern OSU	Scotty	McCartney
Northwestern OSU	Brent	Palacios
Northwestern OSU	Dalton	Pannell
Oklahoma State University	Diamond	Alexander
Oklahoma State University	Zoe	Austin
Oklahoma State University	Tyler	Autry
Oklahoma State University	Asaph Matheus	Barbosa
Oklahoma State University	Brent	Battle
Oklahoma State University	Lindsey	Berger
Oklahoma State University	Joseph	Brown
Oklahoma State University	Trenton	Brown
Oklahoma State University	Kacie	Cardenas
Oklahoma State University	Jessica	Catlin
Oklahoma State University	Mykle	Chavez
Oklahoma State University	Ana	Chicas-Mosier
Oklahoma State University	Rahul	Chidurala
Oklahoma State University	Reina	Clark
Oklahoma State University	Mallory	Cole
Oklahoma State University	Ashley	Collier
Oklahoma State University	Marissa	Commey
Oklahoma State University	Mersades "Sadie"	Daffer
Oklahoma State University	Nataly	Daggy
Oklahoma State University	Kayla	Davis
Oklahoma State University	Maci	Davison
Oklahoma State University	Raymundo	De La Cruz
Oklahoma State University	Amber	Douglas
Oklahoma State University	Ahtia	Edwards
Oklahoma State University	Sage	Ellis
Oklahoma State University	Kristen	Enyart
Oklahoma State University	Zachary	Etier

Oklahoma State University	Leslie	Farias
Oklahoma State University	Brice	Fiddler
Oklahoma State University	Arella	Fields
Oklahoma State University	Darren	Figuerido
Oklahoma State University	Eduardo	Flores
Oklahoma State University	Roberto	Garcia
Oklahoma State University	Derrian	Glynn
Oklahoma State University	Jalen	Golphin
Oklahoma State University	Benjamin	Graham
Oklahoma State University	Shanice	Gray
Oklahoma State University	Sarah	Hamilton
Oklahoma State University	Alexander	Hannah
Oklahoma State University	Alexander	Hardison
Oklahoma State University	Timothy	Higgins II
Oklahoma State University	Isiah	Hill
Oklahoma State University	DeYawna	Jackson
Oklahoma State University	Stephen	James
Oklahoma State University	Danica	Johnson
Oklahoma State University	John "Bill"	Jones
Oklahoma State University	Kody	Jones
Oklahoma State University	Geoffrey	Kibble
Oklahoma State University	Troy	King Jr.
Oklahoma State University	Gbeu	Kone
Oklahoma State University	William	Lightner
Oklahoma State University	Ashley	Lonetree
Oklahoma State University	Michelle	Lopez
Oklahoma State University	Emaun	Mack
Oklahoma State University	Amanda	Mathias
Oklahoma State University	Milecia	Matthews
Oklahoma State University	Devon	McLeod
Oklahoma State University	Nicolas	Means
Oklahoma State University	Nicholas	Melko
Oklahoma State University	Elisa	Mercado
Oklahoma State University	Gretchan	Moore
Oklahoma State University	Rachel	Morgan
Oklahoma State University	Taylor	Osborne
Oklahoma State University	Cameron	Patterson
Oklahoma State University	Julio	Perez
Oklahoma State University	Susan	Pham
Oklahoma State University	Allison	Potts
Oklahoma State University	Abbey	Ramirez

Oklahoma State University	Keely	Redhage
Oklahoma State University	Jaron	Redmond
Oklahoma State University	Roberta	Reed
Oklahoma State University	Zachary “Zach”	Ridge
Oklahoma State University	Julio	Robles
Oklahoma State University	Brooklin	Ryan
Oklahoma State University	Adrian	Saenz
Oklahoma State University	Valentin	Sanchez
Oklahoma State University	Eulojio	Sanchez-Vasquez
Oklahoma State University	Katherine “Katie”	Schwartz
Oklahoma State University	Amanda	Scofield
Oklahoma State University	Jason	Semien
Oklahoma State University	Isaac	Smith
Oklahoma State University	Matthew	Takyi-Micah
Oklahoma State University	Andrea	Talley
Oklahoma State University	Lauren	Thompson
Oklahoma State University	Sheri	Toal
Oklahoma State University	Carolina	Vega Recalde
Oklahoma State University	Taliyah	Ware
Oklahoma State University	Joshua	Warren
Oklahoma State University	Ka’Shay	Warren
Oklahoma State University	Amber	Washington
Oklahoma State University	Hannah	White
Oklahoma State University	Gary	Williams
Oklahoma State University	Grant	Williams
Oklahoma State University	Johnny	Williams
Oklahoma State University	LaTasha	Woodard
Oklahoma State University	Ashane	Woody
Oklahoma State University	Joshua	Yocham

Southeastern OSU	Abe	Blackburn
Southeastern OSU	Cord	Carter
Southeastern OSU	Roy	Cruz
Southeastern OSU	Kent	Davidson
Southeastern OSU	Jaclyn	Evans
Southeastern OSU	Shelby	Fraser
Southeastern OSU	Roberto	Guadian-Ibarra
Southeastern OSU	Laci	LeFlore
Southeastern OSU	Markie	Meadows
Southeastern OSU	Kandace	Monroe

Southeastern OSU	Tyler	Shannon
Southwestern OSU	Alfa	Abame
Southwestern OSU	Megan	Ayala
Southwestern OSU	Dustin	Davilla
Southwestern OSU	Caleb	Hubbard
Southwestern OSU	Mary	Phillips
Southwestern OSU	Ashlie	Walker
Univ. of Central Oklahoma	Cory	Anderson
Univ. of Central Oklahoma	Sharonda	Carson
Univ. of Central Oklahoma	Amanda	Eisemann
Univ. of Central Oklahoma	Luis	Figueroa
Univ. of Central Oklahoma	Janelle	Martinez
Univ. of Central Oklahoma	McKayla	Mashburn
Univ. of Central Oklahoma	Juan	Orozco
Univ. of Central Oklahoma	Chelsea	Smith
Univ. of Central Oklahoma	William	Snow
Univ. of Central Oklahoma	Chelsea	Spencer
Univ. of Central Oklahoma	Yoslin	Vallejos - Elliott
Univ. of Central Oklahoma	Jessica	Webb
University of Oklahoma	Stephanie	Andrade
University of Oklahoma	Tyler	Ashley
University of Oklahoma	Jael	Babb
University of Oklahoma	Phillip	Baker
University of Oklahoma	Gabriela	Berrios
University of Oklahoma	Kristina	Black
University of Oklahoma	Tanner	Blair
University of Oklahoma	Ramiro	Brigueda
University of Oklahoma	Kandro	Brown
University of Oklahoma	Tayler	Brumble
University of Oklahoma	Skylar	Calhoun
University of Oklahoma	Bree	Cooper
University of Oklahoma	Maurice	Dukes
University of Oklahoma	Kylie	Foster
University of Oklahoma	Derek	Garcia
University of Oklahoma	Peter	George
University of Oklahoma	Stephen	Gonzalez
University of Oklahoma	Alexander	Guerra
University of Oklahoma	Miguel	Guerrero

University of Oklahoma	Christopher	Gutierrez
University of Oklahoma	Seamus	Hunt
University of Oklahoma	Fatoumata	Ide Seyni
University of Oklahoma	Kayode	Ifabiyi
University of Oklahoma	William	Kwendi
University of Oklahoma	Lan	Le
University of Oklahoma	Uytran	Le
University of Oklahoma	Ivan	Lopez
University of Oklahoma	Marissa	Mercado
University of Oklahoma	Katherine	Ngo
University of Oklahoma	Shynette	Porter
University of Oklahoma	Kelsey	Raus
University of Oklahoma	Raquel	Redshirt
University of Oklahoma	Brooke	Sewell
University of Oklahoma	Ciore	Taylor
University of Oklahoma	Erin	Thornton
University of Oklahoma	Sergio	Zegarra Cabello

University of Tulsa	Maria	Castaneda
University of Tulsa	Jose	Corcega
University of Tulsa	Trokon	Johnson
University of Tulsa	Thomas	Linscott
University of Tulsa	Jamie	Presley
University of Tulsa	Katherine	Riojas
University of Tulsa	Shannon	Suddath
University of Tulsa	Jauwan	Thomas