

OKLAHOMA LOUIS STOKES AMP

Oklahoma Louis Stokes Alliance for Minority Participation in Science/
Technology/ Engineering /Mathematics



**2006 Report for
Performance Effectiveness Review**

**To
Division of Education and Human Resource Development
Alliances for Minority Participation**

**at
NATIONAL SCIENCE FOUNDATION
ARLINGTON, VIRGINIA**

15 November 2006

**Prepared by
*Valerie Shangreux, Ph.D.***

QuickTime™ and
TIFF (Uncompressed) decompressor
are needed to see this picture.

PI/PD

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DATE _____

Fiscal Officer TYPED NAME & SIGNATURE

Stephen W. McKeever, Vice President

Research and Technology Transfer

DATE _____

**Oklahoma Alliance for Minority Participation
"PERFORMANCE EFFECTIVENESS" REVIEW (P.E.R.)**

November 15, 2006

The National Science Foundation

4201 Wilson Blvd. ROOM 815

Arlington, VA 22230

2006

PERFORMANCE EFFECTIVENESS REVIEW

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

PERFORMANCE EFFECTIVENESS REVIEW

PROJECT PARTICIPANTS

KEY PROJECT PERSONNEL

The Oklahoma Louis Stokes Alliance is comprised of the following key personnel:

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ORGANIZATIONAL PARTNERS

The Oklahoma LSAMP has joined in a number of partnerships that enhance our ability to serve more students and to use NSF funds strategically. Other partnerships include:

Native American In the Biological Sciences (NABS) Program, Oklahoma State University - The Oklahoma State University LS-OKAMP Program and NABS have collaborated in recruiting participants and holding joint meetings and workshops for scholars. Additionally, several NABS scholars presented their research at the LS-OKAMP annual symposium.

Oklahoma State University - Oklahoma City (OSU-OKC) – For the past several years, OSU-OKC has offered the OK-LSAMP scholars the opportunity to register for their on-line GRE Preparation class at a reduced cost. Tuition and text costs are paid for by each Partner.

Oklahoma State University Graduate College - continues to invite LS-OKAMP scholars to participate in their Research Symposium and to provide graduate school preparation and effective research presentation workshops to the Oklahoma LSAMP Program.

McNair Scholars Programs – Partner Institutions continue to actively collaborate with the McNair Scholars Program and Student Support Services Program where they exist to provide identify and recruit students to the Alliance, provide academic services, research activities and opportunities to visit graduate schools.

University of Oklahoma Biological Station - In order to provide ongoing field opportunities for his OK LSAMP students Dr. Patton, Campus Coordinator at Southeastern Oklahoma State University (SEOSU) has partnered Dr. Chad Hargrave (now at Sam Houston State University) to conduct research on the effects of golden algae on reservoirs. One of his students, James Morel assists with this research.

United States Bureau of Reclamation (US BOR) - Dr. Patton, Campus Coordinator, SEOSU in cooperation with Dr. Mark McKinstry, Research Scientist, US BOR, offered a class entitled *Western River Ecology* during the May 2006 intersession through the Department of Biological Sciences at SEOSU. Ten students participated in the class, including some of Dr. Patton’s OK LSAMP scholars. The objectives of the class were to become familiar with the issues surrounding rivers in the Western United States and to collect data for ongoing monitoring efforts conducted by the US BOR. Two SEOSU OK LSAMP students, James Morel and Stormy Shoopman assisted with ongoing research in collaboration with the US BOR.

COST SHARE

| | P.I. | Pro Manager | Res. Special. | Participant | Subtotal | Unfunded | Waived | Third Party | Third Party | | Total |
|--------------|---------------|--------------|---------------|-------------|---------------|---------------|--------------|-------------|--------------|--------|----------------|
| | E Mitchell | Z Drain | Y Sherif | Support | Direct Costs | F&A | F&A | o-P.I. | Subcontract | | |
| | 35% | 100% | 25% | Costs | | | | Mize | Institutions | | |
| | S&F | S&F | S&F | | | | | S&F | | | |
| | \$89,412.00 | \$143,501.00 | \$38,502.00 | \$40,000.00 | \$311,415.00 | \$153,062.00 | \$148,895.00 | | \$553,536.00 | | \$1,166,908.00 |
| Oct-04 | | | | | | | | | | | |
| Nov-04 | \$6,125.26 | \$6,357.82 | \$875.96 | | \$13,359.04 | \$7,587.93 | \$2,695.54 | | \$0.00 | | \$23,642.51 |
| Dec-04 | \$6,125.26 | \$6,357.82 | \$875.82 | | \$13,358.90 | \$7,587.86 | \$3,378.88 | | \$0.00 | | \$24,325.64 |
| Jan-05 | \$6,125.24 | \$6,357.82 | \$875.96 | \$3,225.00 | \$16,584.02 | \$7,587.92 | \$3,029.60 | | \$0.00 | | \$27,201.54 |
| Feb-05 | \$6,125.26 | \$6,357.82 | \$875.96 | | \$13,359.04 | \$7,587.93 | \$3,397.82 | | \$0.00 | | \$24,344.79 |
| Mar-05 | \$6,125.26 | \$6,357.82 | \$875.96 | \$1,200.00 | \$14,559.04 | \$7,587.93 | \$2,503.84 | | \$0.00 | | \$24,650.81 |
| Apr-05 | \$6,125.26 | \$6,492.78 | | | \$12,618.04 | \$7,167.05 | \$2,696.12 | | \$26,750.00 | | \$49,231.21 |
| May-05 | \$6,125.24 | \$6,492.78 | \$875.95 | | \$13,493.97 | \$7,664.57 | \$11,673.94 | | \$0.00 | | \$32,832.48 |
| Jun-05 | \$6,125.26 | \$6,492.79 | | | \$12,618.05 | \$7,167.05 | \$6,681.18 | | \$61,333.47 | | \$87,799.75 |
| Jul-05 | \$6,193.13 | \$6,577.47 | \$873.15 | | \$13,643.75 | \$7,476.78 | \$9,401.24 | | \$4,060.80 | | \$34,582.57 |
| Aug-05 | \$6,193.14 | \$6,577.49 | \$493.62 | \$2,475.00 | \$15,739.25 | \$7,268.81 | \$11,924.26 | | \$56,482.82 | | \$91,415.14 |
| Sep-05 | \$6,193.11 | \$6,577.49 | \$873.15 | \$1,700.00 | \$15,343.75 | \$7,476.78 | \$6,506.66 | | \$3,363.93 | | \$32,691.12 |
| Oct-05 | \$6,317.47 | \$6,749.91 | \$891.66 | \$3,000.00 | \$16,959.04 | \$7,649.55 | \$5,847.58 | | \$1,310.54 | | \$31,766.71 |
| Nov-05 | \$6,317.45 | \$6,749.91 | \$891.65 | | \$13,959.01 | \$7,649.54 | \$5,658.26 | | \$59,301.49 | | \$86,568.30 |
| Dec-05 | \$6,317.45 | \$6,752.91 | \$891.64 | | \$13,962.00 | \$7,651.18 | \$15,066.62 | | \$13,749.35 | | \$50,429.15 |
| Jan-06 | \$6,441.09 | \$6,749.91 | \$891.66 | \$4,525.00 | \$18,607.66 | \$7,717.30 | | | \$41,282.07 | | \$67,607.03 |
| Feb-06 | \$6,441.11 | \$6,749.92 | \$891.66 | | \$14,082.69 | \$7,717.31 | \$11,831.24 | | \$0.00 | | \$33,631.24 |
| Mar-06 | \$10,861.49 | \$6,749.91 | \$891.66 | | \$18,503.06 | \$10,139.68 | \$2,792.70 | | \$13,295.41 | | \$44,730.85 |
| Apr-06 | \$10,861.49 | \$6,749.91 | \$891.66 | | \$18,503.06 | \$10,139.68 | \$7,050.34 | | \$49,909.14 | | \$85,602.22 |
| May-06 | \$10,861.47 | \$6,749.90 | \$891.66 | | \$18,503.03 | \$10,139.66 | \$4,030.78 | | \$11,506.48 | | \$44,179.95 |
| Jun-06 | \$10,861.49 | \$6,749.90 | | | \$17,611.39 | \$9,651.04 | \$1,848.78 | | \$46,214.15 | | \$75,325.36 |
| Jul-06 | \$10,884.51 | \$6,790.57 | \$901.67 | | \$18,576.75 | \$10,180.06 | \$4,549.68 | | \$7,404.24 | | \$40,710.73 |
| Aug-06 | \$11,079.15 | \$6,953.43 | \$918.55 | | \$18,951.13 | \$10,385.22 | | | \$39,759.95 | | \$69,096.30 |
| Sep-06 | \$11,079.15 | | \$918.55 | | \$11,997.70 | \$6,574.74 | | | \$1,817.53 | | \$20,389.97 |
| Oct-06 | \$11,079.15 | | \$918.55 | | \$11,997.70 | \$6,574.74 | | | \$0.00 | | \$18,572.44 |
| mt. document | \$186,983.89 | \$145,496.08 | \$18,286.10 | \$16,125.00 | \$366,891.07 | \$194,330.31 | \$122,565.06 | \$0.00 | \$437,541.37 | \$0.00 | \$1,121,327.81 |
| MT. REDED | (\$97,571.89) | (\$1,995.08) | \$20,215.90 | \$23,875.00 | (\$55,476.07) | (\$41,268.31) | \$26,329.94 | \$0.00 | \$115,994.63 | | \$45,580.19 |

ALLIANCE COLLABORATORS

Oklahoma Experimental Program to Stimulate Competitive Research (EPSCoR) - The Oklahoma Louis Stokes AMP and the Oklahoma EPSCoR program entered into an agreement in which EPSCoR provided support for up to two OK-LSAMP students as Undergraduate Research Interns to be involved with investigators working in EPSCoR's science themes: nanoscale materials science and engineering or plant virus biodiversity and ecology. Students were assigned to an EPSCoR research mentor and presented their findings at the Fall 2006 OK-LSAMP Symposium and at a professional society meeting.

One student was identified who fit into these highly specific areas. Working with a faculty mentor in Plant Pathology he conducted research was on Potato virus X and the role of the viral movement proteins in trafficking virus through plasmodesmata. The culmination of his research experience was presented at the Southern Section of the American Society of Plant Biologists Annual meeting in Daytona Beach, Florida in February 2006.

Additionally, EPSCoR provided 100% of the funding for 2 students and 2 chaperones to participate in the National Conference for Undergraduate Research held in April 2006. Both students made presentations.

Minority Biomedical Research Support Program (MBRS) – Dr. Nancy Paiva, Department of Physical Sciences, Southeastern Oklahoma State University mentors one of Dr. Patton's OK LSAMP scholars, Ricardo Lemus, Chemistry Major, SEOSU. The MBRS provides the research site, lab equipment, etc for his research on the development of products for mosquito control.

ACTIVITIES AND FINDINGS

The Graph below shows the progression of OK-LSAMP STEM graduates. Between 1994 and 2006, annual STEM graduation rates from underrepresented populations increased progressively from 214 to 893. This growth is consistent with our original projections. The 893 STEM graduates in 2006 establish an excellent baseline for a critical mass of graduate students.

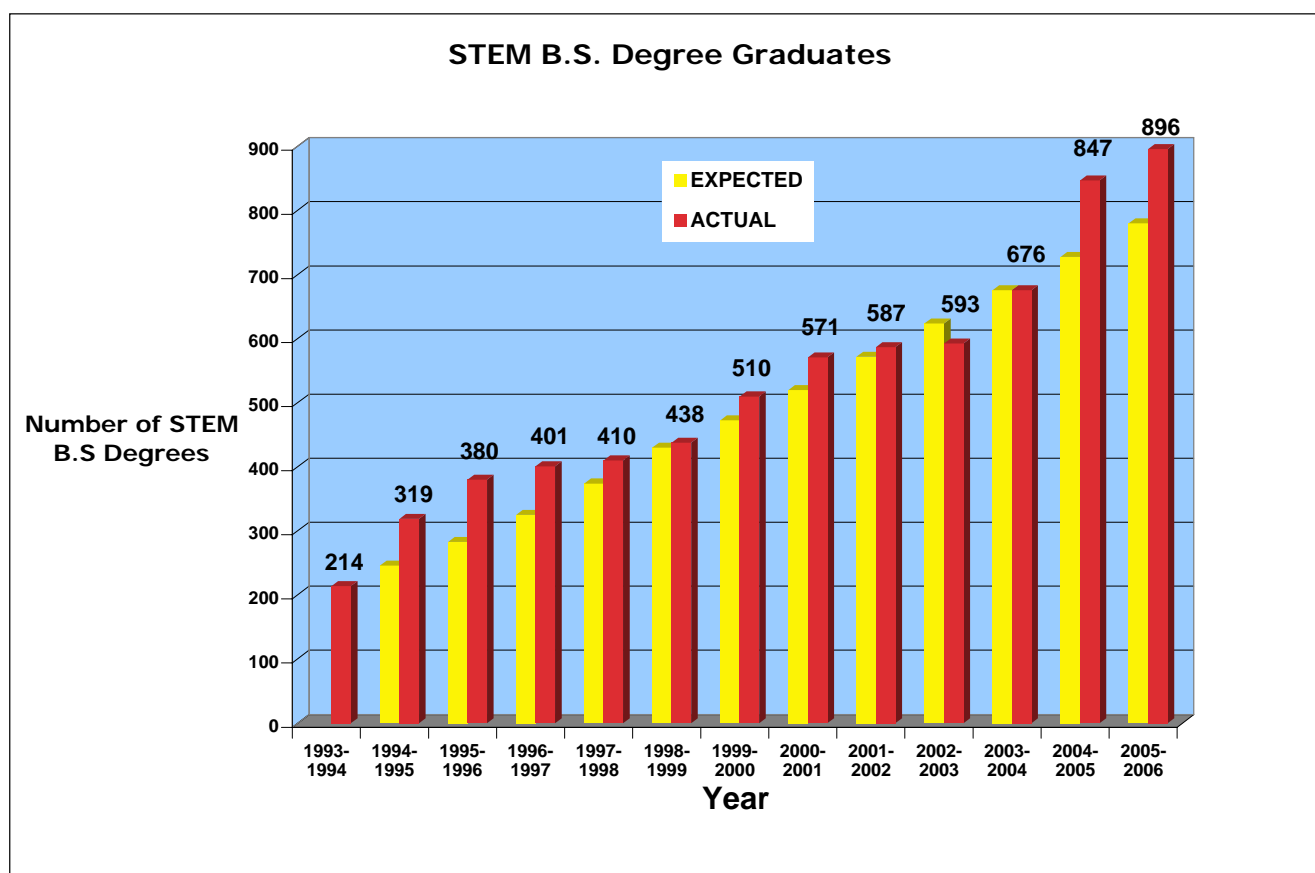


Figure 1. Growth of graduates with B.S. degrees in STEM areas. (The annual number of graduates establishes a critical mass for potential graduate students.)

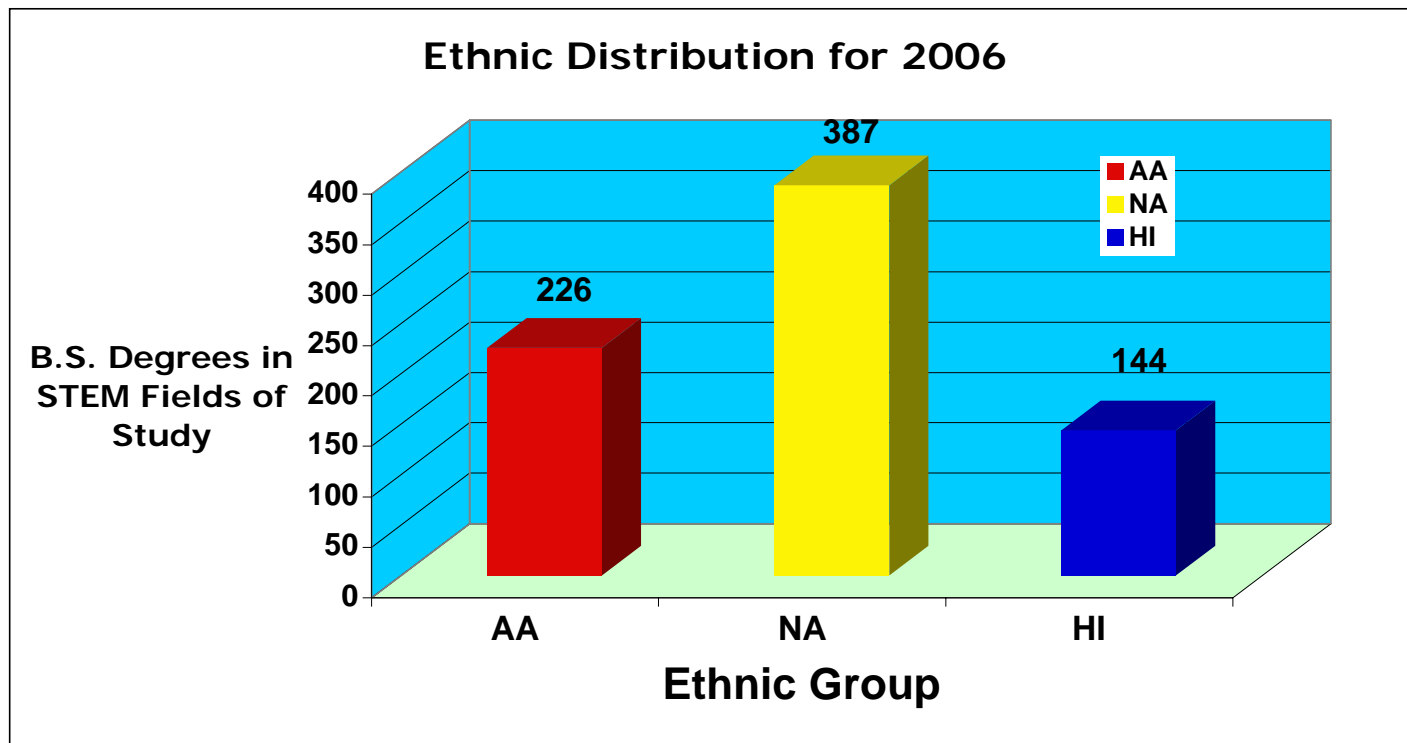


Figure 2. Ethnic Distribution of Graduates in STEM Fields for 2006 (The 387 B.S. degrees for Native Americans are 30 % of the graduates in the Nation. Oklahoma continues to be the leader in the number of Native Americans earning STEM degrees.)

Major Research and Educational Activities

The Oklahoma LSAMP's stated goal in Phase III is to significantly increase the number of targeted students pursuing entering into graduate programs preferably to earn the doctorate over the next five years. Toward meeting this shared goal, three main program components have been developed and implemented Alliance wide. The following section discusses each of these components in detail.

1. *Formation Of A Strong Research Experience In Their Last Two Undergraduate Years With Two Full Summers Of Research And Two Academic Years Of Research Activities*

The undergraduate research experience is the key OK-LSAMP activity in which all students must participate. We believe this is the most practical and effective way to provide value-added graduate school and career preparation. The Oklahoma Alliance offers our scholars many opportunities for research training including both academic year and summer research and to attend and present their research at local, regional, and national conferences.

Semester Research Mentoring Component. All of the Partner Institutions offer the Research Mentoring Component. Students are required to identify a faculty mentor, develop an approved research project, and to spend time conducting research during the academic year.

Summer Research Internships. During the summer semester, students have the opportunity to expand on their academic year research experience. All Partner institutions in the Alliance offer Summer Research Internship Programs. Each Partner is funded to offer summer internship opportunities on their campus. Stipends up to the amount of \$3,500.00 are offered for two months of full-time research. Students can conduct research on their own campus as well as on any of the Alliance Partner campuses.

OK LSAMP scholars are also encouraged to participate in Research Experiences for Undergraduates (REU's) or similar programs at other institutions as well as conduct internships in National Labs, corporations and with state and federal agencies. Following is a list of scholars who conducted research or internships in sites beyond the Alliance and their research sites:

- Sabrina Scroggins, Erik Gonzales, Andrea Christy, and Jonathan Gonzales, East Central University participated in the McNair Scholars program research at Kerr Research Center, Ada OK.
- Danny Terry, Langston University interned at Duke University Medical Center, Durham NC
- Nathan Williams, Langston University interned at Texas A&M, College Station TX
- Leethaniel Brumfield, Langston University interned at University of Arkansas, Fayetteville AR
- Erik Gonzales, East Central University participated in an REU at University of Texas Southwestern Medical Center, Dallas TX
- Dana Duncan, East Central University conducted an internship at Oklahoma Department of Environmental Quality, Shawnee OK
- Uduak Williams, University of Tulsa did her summer internship at M.D. Anderson Cancer Center, Houston TX
- Paul Wright, Oklahoma State University conducted his internship at Spirit AeroSystems, Wichita KS
- Derek Blyth Langston University, Lockheed Martin, Atlanta GA
- California Institute of Technology, Pasadena, CA
- Stormy Shoopman, Southeastern Oklahoma State University conducted research with the Tishomingo National Wildlife Refuge, Tishomingo, OK

The annual statewide OK LSAMP Research Symposium was held March 23, 2006 at the Oklahoma State University. One hundred and ten people registered including faculty, staff and students. Forty-eight students from across the Alliance presented their research including 6 Native Americans in the Biological Sciences scholars and several guests from Langston University.

OK LSAMP scholars continue to present their research at state, regional and national symposiums. This past year we have had scholars present at:

- National Sigma Xi Annual Meeting and Student Research Conference, Seattle WA
- Oklahoma Posters on the Hill, Oklahoma City OK
- New Mexico AMP, Las Cruces, NM
- American Indian Science and Engineering Society Annual Conference, Charlotte NC
- American Chemical Society National Meeting, Atlanta GA
- American Fisheries Society Annual Meeting, Anchorage AL
- Southern Division of the American Fisheries Society, San Antonio TX
- National Society of Black Engineers, Region 5, Annual Regional Conference, Oklahoma City OK
- American Society of Mechanical Engineers, District E 2006 Student Conference, Fayetteville AR
- National Conference on Undergraduate Research, Asheville, NC
- Biomedical Science Careers Program / New England Science Symposium, Boston, MA
- American Society of Plant Biology, Daytona Beach, FL

2. *Full Participation In Graduate School Preparation Component*

- Graduate School Preparation Modules are on our website (ls-okamp.okstate.edu) for all Partner Institutions' use.
- Scholars continue to take advantage of the on-line GRE Preparation course offered at a reduced cost to the Alliance through OSU-OKC.
- Scholars Meetings implemented throughout the Alliance offer a forum for educational speakers and workshops focused on graduate school preparation and career development.

3. *Institutionalization Of A Graduate Education Culture Within The Underrepresented Group Culture And Environment.*

Each year at the Annual Symposium, participants from across the Alliance attend a workshop focused specifically on Graduate Education. This year, the Oklahoma State University Graduate College offered a workshop entitled "Let's Talk About Graduate School" featuring a panel presentation given by Bridge to Doctorate scholars from both Oklahoma State University and the University of Oklahoma and moderated by personnel from the Graduate College.

Additionally, the opening session at the Annual symposium was a workshop entitled “Scientific Integrity and Ethics” given by Earl D. Mitchell, Jr., OK LSAMP Program Director. Further on some partner campuses scholars are given lectures on Ethics during scholars meetings.

Scholars throughout the Alliance continue to be encouraged and supported in traveling to visit graduate schools on other campuses.

VALUE-ADDED INTER AND INTRA-INSTITUTIONAL PROGRAMMING AND COHERENCE

Common program components, shared resources and coherence among Partner institutions provide “value-added” inter and intra-institutional programming and coherence” to the Oklahoma LSAMP. Following are specific:

Common components: The inter-institutional collaboration among the eleven Partner 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.

- All Partner Institutions offer Scholars Programs including financial and academic support, academic year Research Mentoring Components and a Summer Research Internship Program. Across the Alliance, these programs focus on retention, high academic achievement and graduate school preparation.
- Tutoring: Students experiencing difficulty with coursework are strongly encouraged to make this known to the Campus Coordinator as early as possible. Compensation is provided by the program.
- Scholars throughout the Alliance continue to take advantage of the on-line GRE Preparation course **offered at a reduced cost to the Alliance** through OSU-OKC

Shared resources

- Inter-institutional collaboration - each summer a number of students conduct their internships at Partner institutions. Each Partner is funded to offer summer internship opportunities on their campus, **but because of inter-institutional collaboration scholars can also conduct research on Alliance Partner campuses**
 - Rosa Madrid, Industrial Engineering Major, OSU conducted research with Dr. Ovadia Shoham, Department of Industrial Engineering and Management, University of Tulsa
 - Cammi Valdez, Chemistry and Mathematics Major, Southwestern Oklahoma State University conducted research with Dr. Zhou and Dr. Han Wang, Department of Zoology, University of Oklahoma
 - Tomica Blocker, Langston University conducted research with Dr. Wells at the University of Central Oklahoma
 - Jason Chandler, Chemistry Major, Langston, conducted research with Dr. Shankar, Department of Pharmaceutical Sciences, University of Oklahoma
- Graduate School preparation information workshops for OK LSAMP students are available to the Alliance through the Oklahoma State University Graduate College.

Coherence of Program

- Quarterly Alliance meetings, held at the Oklahoma Regents for Higher Education Office in Oklahoma City, are a forum for ongoing communication on overall program operation and specific program implementations on each campus.
- Program newsletters and other program publications enhance communications between Partner Institutions and maintain the coherence of the program.
- Unitized data system

EVIDENCE OF INSTITUTIONALIZATION

1. At East Central University (ECU) the Vice president of academic Affairs has made college work-study funds available to all eligible ECU OK LSAMP scholars. Several students take advantage of this each semester to conduct their research. In this way, they are able to support more students to conduct research.
2. Other programs that have research components and faculty on our campuses that have research projects are now **seeking OK LSAMP scholars**. Specific examples of requests include:

- Oklahoma Experimental Program to Stimulate Competitive Research (EPSCoR) collaborates with OK LSAMP to identify undergraduate research scholars
- Satish Bukkapatnam, Associate Professor, School of Industrial Engineering & Management, Oklahoma State University has an NSF REU program and is mentoring two OK LSAMP scholars
- The Campus Coordinator at Southwestern Oklahoma State University reports receiving several requests from research faculty for OKAMP students to work with ongoing research projects

3. The Program Managers Position

MAJOR FINDINGS.

LS-OKAMP Program Phase III Evaluation This component was developed by our Evaluator Dr. Rosemary Hayes.

Rosemary Hayes, Ph.D.
The University of Oklahoma
NSF LS-OKAMP Program Evaluator

The following section of the report addresses the goals and outcomes reported by the LS-OKAMP partners.

Alliance-wide Goals

The LS-OKAMP program proposes to significantly increase the number of targeted students entering into graduate programs over the next five years, preferably to earn doctorates. To this end, the goal of the Alliance is to have a minimum of 10% of the available baccalaureate degree graduates over the next five years eligible for graduate school for admission and subsequently enrollment.

Graduate School eligibility has been defined as:

- Min 3.0 GPA
- Two full summer internships
- Annual presentation of research
- Taken GRE by fall of Senior Year
- Minimum 5 applications to graduate school

Phase III of the LS-OKAMP program focuses on junior and senior underrepresented STEM majors. Despite the focus on these students, The Oklahoma Alliance partners also have reported continued involvement with freshman and sophomores. This continuing involvement demonstrates institutional commitment to LS-AMP and the understanding that the continuing development of this group of students is necessary to have upper division students who are qualified for admission to graduate programs in STEM fields.

Of the 121 students who are participating at various levels in the Oklahoma Alliance, 70 students made up the Phase III cohort of upper classmen. The students are classified by race/ethnicity and class standing as shown below in Table 1. As is typical with participation in STEM fields, there are more male participants (69%) than female participants (31%). Table 2 shows a further breakdown of participants by partner institution. It should be noted that one institution, Northwestern, did not have upper division students eligible for participation in Phase III at the beginning of Fall 2005. They continue their work with lower division students however, and will contribute to the cohort base as those students advance through their degree program.

Table 1: Class Standing and Ethnicity

| Standing | A I | Black | Hisp | Total |
|-----------------|------------|--------------|-------------|--------------|
| Junior | 14 | 6 | 7 | 27 |
| Senior | 23 | 15 | 5 | 43 |
| Total | 37 | 21 | 12 | 70 |

Table 2: Participants by Partner Institution

| Institution | Junior | Senior | Total |
|-------------|--------|--------|-------|
| CU | 3 | 4 | 7 |
| ECU | 1 | 10 | 11 |
| LU | 0 | 9 | 9 |
| NEOSU | 5 | 0 | 5 |
| OSU | 4 | 5 | 9 |
| OU | 9 | 7 | 16 |
| SEOSU | 0 | 4 | 4 |
| SWOSU | 2 | 0 | 2 |
| Tulsa | 1 | 2 | 3 |
| UCO | 2 | 2 | 4 |
| Total | 27 | 43 | 70 |

Alliance wide Strategies:

The Alliance as a whole engaged in a number a strategies to help ensure that at a minimum 10% of the students would meet the definition of graduate school eligible. Some of the specific strategies engaged in by the individual partners will be discussed later. However, all worked to see that students maintained grade point averages, were encouraged to participate in meaningful research, achieve useful GRE scores, and make applications to graduate college.

The record shows that as a result of these activities large percentages of student participants were receiving the preparation needed to be graduate school eligible.

- 86% of the 57 students for whom GPAs were reported carried a GPA of 3.0 or above (no data available on 14 students)
- 57% of the 70 cohort members participated in research during the Fall 2005 and/or Spring 2006 Semester
- 50% of the cohort participated in a summer internship

Persistence towards the goal of completion within STEM

One measure of looking at the favorable performance of a cohort is to look at persistence of the cohort toward graduation. Persistence is defined as the percentage of a cohort that graduates plus the percentage of the cohort that continues in the pursuit of graduation. With the support of the Oklahoma Alliance 98% of minority STEM participants either graduated or remained in school and continued with their studies.

- 29 of the 70 cohort members graduated in the Fall, Spring or Summer of 2005-06 (41% graduated)
- 33 of the 70 cohort members continued their studies and registered the following Fall 2006. (47% continued). These 33 continuing students constituted 80% of the remaining 41 cohort members (9 students did not re-register)

As has already been discussed, 29 of the Phase III cohort (41%) graduated during the Fall, Spring and/or Summer of 2005-06. Table 3 shows the partner institutions from which these students graduated.

Table 3: Graduates by Partner Institution

| Institution | Graduates |
|-------------|-----------|
| CU | 2 |
| ECU | 8 |
| LU | 5 |
| OSU | 2 |
| OU | 5 |
| SEOSU | 2 |
| Tulsa | 2 |
| UCO | 3 |
| Total | 29 |

In addition to successfully completing a baccalaureate program with a GPA and research background to support graduate school admission, LS-OKAMP students are encouraged to take the GRE. Thirty-four percent of the LS-OKAMP graduates took the GRE.

Alliance overall goal achieved

The goal of the Alliance is to have a minimum of 10% of the available baccalaureate degree graduates over the next five years eligible for graduate school for admission and subsequently enrollment. Given the GPAs and research experience of the group, many students have the potential to move on to graduate STEM work. Of the 29 graduates during the Fall, Spring and/or Summer of 2005-06, 55% (16 students) were identified as having been admitted to graduate school.

Table 4: Graduate School Admission by Institution

| Institution | Applying | Admitted | Total |
|-------------|----------|----------|-------|
| CU | | 2 | 2 |
| ECU | 1 | 3 | 4 |
| LU | 2 | 3 | 5 |
| OSU | | 1 | 1 |
| OU | | 5 | 5 |
| SEOSU | | 1 | 1 |
| SWOSU | 1 | 1 | 2 |
| Tulsa | | 2 | 2 |
| UCO | | 2 | 2 |
| Total | 4 | 20 | 24 |

Institution Specific Strategies

In the following section, some of the specific research activities and institutional strategies used over the past year will be identified.

Cameron University Strategies for Fall 2005 – Summer 06 Academic Year:

Research Activities:

David Mendez started research with Dr. Johari in the Fall of 2005 and continues his research with Dr. Johari at this time. He received a MultiMedia Design internship for the Summer of 2006 with the Cameron/AST team through an OCAST Grant working with Dr. Johari and Dr. Aguilar.

Valerie Toodle was selected as the McNair Intern for the Summer 2005 and did research under Dr. McGuire. Her research was initiated Fall 2004 and ended May 2006 upon her graduation. She spent the summer of 2006 at Oklahoma University Health Science Center doing research in the ENBRE program.

Courtney Hill joined Dr. McGuire's group in the Spring of 2005. Some health problems restricted her travel for the summer so she did not complete a full internship. She spent approximately three days a week working in the lab during the summer with some departmental support and continued her research in the 2005 – 2006 academic year.

Lloyd Hill joined the program Fall 2005. He started doing research with James Cook of the Technology Department and assisted in the design and construction of their vehicle for entry into the bicycle / moon rover competition. Poor performance and family problems caused him to withdraw from school. He has completed and Associate Degree.

Anthony Hoahwah is a student of Dr. Johari. He was carried over into the program as a sophomore but was counseled as to grade performance and expectations. He did not return to school for the Spring 2006 semester.

Karisa Beacham joined the program Spring 2006. She has started working with Dr. McGuire's group and was a 2006 Summer McNair Intern.

Chad Kiser is a new student to the program. He works at Halliburton and is completing a second degree. He does contract agriculture research all year round in addition to his work. He and Dr. Juanita Cassidy have initiated a "related to work but do on your own time" project for the summer and Fall. We tried to do this last summer but time did not permit. Mr. Kiser received partial support for the summer as an intern.

Annette Moulder is a new Fall 2006 Stokes Scholar and has initiated research in Dr. Johari's group.

Local, state, regional and national meetings, and name of conference/meeting attended by students:

Valerie Toodle presented as a PowerPoint presentation at the McNair Conference in Kansas City, September, 2005 and at the Regional Meeting of the American Chemical Society in Memphis, TN, November 2005. "The Synthesis and Protonation Study of (5-C5H5)Fe(CO)2S(C6H4-p-I)", Valerie Toodle (LS-OKAMP, McNair Scholar), Courtney Hill (LS-OKAMP), Dr.

Danny McGuire (mentor), Enoch Faustin, Cameron University, Department of Physical Sciences. Her poster was displayed at the Fall 2005 Louis Stokes Research Conference at Stillwater but that was the same day she was in Kansas City.

Courtney Hill presented a poster at the Undergraduate Research Conference at University of Central Oklahoma in November, 2005. "The Synthesis and Protonation Study of $(5-C_5H_5)Fe(CO)_2S(C_6H_4-p-I)$ ", Courtney Hill (LS-OKAMP), Valerie Toodle (LS-OKAMP, McNair Scholar), Dr. Danny McGuire (mentor), Enoch Faustin, Cameron University, Department of Physical Sciences.

Both Courtney Hill and Valerie Toodle were supported as attendees to the Regional Meeting of the American Chemical Society in Memphis, TN, November 2006. They were escorted by Dr. McGuire.

David Mendez presented at a Multimedia conference in October, 2005 and presented this September at the Fall 2006 Louis Stokes Research Conference at Stillwater. "Learning Computer Skills Via an Animated Procedural Tutorial" David Mendez, Annette Moulder, and Dr. Abbas Johari Cameron University, Department of MultiMedia Instructional Design

Karisa Beacham presented this September at the Fall 2006 Louis Stokes Research Conference at Stillwater "A Novel Zirconocene Catalyst" Karisa Beacham and Dr. Danny Guire, Cameron University, Department of Physical Sciences. Karisa also attended and presented a poster at the McNair Regional Conference in October 2006, Ft. Collins Colorado. Karisa also attended the ACS Regional Meeting of the American Chemical Society, October 2006, Houston, Texas. She and other students were escorted by Drs. Snider and Buckley.

Annette Moulder presented at a Multimedia conference in October, 2006 and presented this Fall at the Fall 2006 Louis Stokes Research Conference at Stillwater. "Learning Computer Skills Vis an Animated Procedural Tutorial" Annette Moulder, David Mendez, and Dr. Abbas Johari, Cameron University, Department of MultiMedia Instructional Design.

Activities provided in cooperation with the McNair Program:

Cameron LSOKAMP student were encouraged to participate in the training programs provided by McNair and the Physical Science Department for Preparation for the Graduate Record Exam. Scholars of both programs were encouraged to utilize study modules available on the LS-OKAMP web site.

Meetings held during the 05-06 Academic Year, and the number of students who attended each meeting:

September 8, 2005 - Organizational meeting and survey of attendees for the research conference September 24 in Stillwater. (4 in attendance)

November 22, 2005 – Thanksgiving meeting and Tree decoration (5 in attendance at some time)

February 9, 2006 – Spring organizational meeting. New members (Karisa) and Spring plans.

April 7 – "Separation of Sperm and Epithelial Cells in a Microfabricated Device: Potential Application to Forensic Analysis of Sexual Assault Evidence" Courtney Hill's Literature for Physics and Chemistry presentation. (3 LSOKAMP members present and 35 others)

May 3 – "Small Molecules Inhibitors of Bacterial Quorum Sensing and Biofilm Formation" Valerie Toodle's Literature for Physics and Chemistry presentation. (3 LSOKAMP members present and 21 others).

Throughout the year but especially at the beginning and prior to drop dates scholars were requested to come in for grade – checks and enrollment counseling.

Details of student participation in Summer Internships this past summer:

Valerie Toodle – ENBRE internship, May, June, July 2006, Oklahoma University Health Science Center.

David Mendez – MultiMedia Design Internship, Department MultiMedia Instructional Design, Cameron University.

Karisa Beacham – McNair Internship, Department of Physical Sciences, Cameron University.

LSOKAMP Student attending graduate school 2005-2006:

Valerie Toodle has applied at several graduate schools, visited Johns Hopkins, USC-Berkeley, and Washington University - St. Louis. She received comparable offers from Hopkins, Berkeley, and Washington and accepted the \$25,500 offer at Hopkins in the Department of Pathobiology. She had an 1190 on her GRE and a 3.55 GPA. She canceled the other graduate

school applications. She has accepted an ENBRE position this summer. She plans to start early to leave early for orientation at Hopkins.

Joseph Vasquez (May 2005 Cameron graduate) started graduate school in mathematics in January 2006 at OU as a member of their Bridge Program.

David Mendez (December 2006 graduate) plans to start graduate school at Oklahoma University in January 2007.

East Central University Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Sabrina Scroggins, Erik Gonzales, Andrea Christy and Jonathan Gonzales participated in the McNair Scholars program's research at the Robert S. Kerr Environmental Research Lab.

Audrey Myers did research in the ECU Chemistry Department on the interaction of zinc oxide with water vapor at elevated temperatures.

Four students did summer research.

Audrey Myers, Dana Duncan and Jonathan Gonzales were supported by ECAMP, while Erik Gonzales did an REU at the University of Texas Southwestern Medical Center in Dallas. All four presented their results at the OSU Research Symposium September 23 in Stillwater.

Meetings held during the 05-06 Academic Year, and the number of students who attended each meeting:

October 24 – Ecamp meeting 5 PM with free pizza and drinks. About 10 students attended. Need to apply to graduate school discussed.

November 10 – ECAMP meeting at noon with Dr. Earl Mitchell and Dr. James Wickstead attending plus 12 students and faculty. Free pizza and drinks. Graduate school discussed in detail.

February 21 – ECAMP meeting – 8 students attending. Free pizza and drinks. Graduate school and summer plans discussed.

March 22 – Ethics lecture in ESTEP room at 7 PM. All ECAMP students invited. Roll not taken. *A brief report from Kathy Niblett on her work with the OK-LSAMP students:*

Kathy Niblett Gardenhire (married September 30, 2005) continued her work as Native American Counselor at ECU. She also assisted Dr. Rutledge as Campus Coordinator by providing enrollment and transcript data on all ECAMP students and by recruiting students from the Native American student population. She worked with him in selecting scholars for the fall and spring semesters and making sure all met the requirements. Her close contact with those students provided him with additional information as to their progress toward their degrees and their interest in and application for graduate school. Starting in June, 2006, Kathy became the Assistant to the President for Diversity and will have even more contact with and influence on the underrepresented minorities at ECU, as her new position includes not only Native Americans but all under-represented minorities.

Each student was to be assigned a faculty mentor in their major.

This was accomplished. All students met this requirement.

Graduate school visits and student visiting:

Erik Gonzales visited two schools, the University of North Texas in Denton and the University of Texas Southwestern Medical Center in Dallas. Also, Sabrina Scroggins visited the OU Health Sciences Center in Norman with the McNair Scholars.

Activities with the McNair Scholars program:

Erik Gonzales traveled with other McNair scholars to the University of North Texas in Denton and the University of Texas Southwestern Medical Center in Dallas. Erik later did an REU in the summer at UT Southwestern.

Langston University Strategies for the Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Langston reported in their spreadsheet that one person participated in research during Spring 2006. However, the type of research conducted was not documented.

Meetings held during the 05-06 Academic Year, and the number of students who attended each meeting:

Due to student schedules, we do not have a formal meeting. The alternative is not at all smart, however, it is functional. Most of these students were taking a chemistry course on the 3rd floor Hamilton Hall. Therefore, I had contact with most students on a daily bases. Also, I am known for how many e-mails are sent to the students regarding new BD locations or REUs.

Northeastern State University Strategies for the Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Microwave Polymerization Reactions – Sediment Studies of the Illinois River Basin – Engineering Robotics – Salmon Population near Homer, Alaska

Students participating in on site visits to graduate departments:

Yes, one did. The others will go this year.

Student meetings held last year, and the number of students who attended each meeting:

All students attended the monthly meetings in September, October, November, January, February, March, and April.

Each student was to meet individually with the campus director at least twice during the semester:

Yes, this was accomplished.

Northwestern OK State University Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

NONE

Student meetings held during last year, and the number of students who attended each meeting:

Fall 2005: each student met with Mr. Maharry twice during the semester on an individual basis

Spring 2006: each student met with Mr. Maharry twice during the semester on an individual basis

**with only two students in the program it was simpler to just arrange individual meetings

Oklahoma State University Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

During the Fall 2005-Spring 2006 Academic Year, the following students participated in the Mentoring Component. This includes regular meetings with faculty mentors and conducting research 5-10 hours per week for the entire semester.

| | |
|------------|---------|
| Brown | James |
| Contreras | Andrew |
| Harrington | Mirella |
| Madrid | Rosa |
| Miller | Evan |
| Nash | Randall |
| Rivera | Laticia |
| Stutson II | Donald |
| Umana | Aniemi |
| Walker | Shane |
| Wright | Paul |

The following scholars participated in the Summer Research Internship Program (RIP):

| | |
|---------|---|
| Gipson | Shannon (A Langston student who interned at OSU) |
| Henry | Michael |
| Madrid | Roda |
| Magrath | Aimee (New scholar who entered the program via the RIP component) |
| Miller | Evan |
| Nash | Randall |
| Rivera | Laticia |
| Wright | Paul (Interned with Spirit AeroSystems, Wichita, KS) |

James Brown presented in Florida at the American Society of Plant Biology in Daytona Beach during the Spring 2006 semester.

Students who participated in the Graduate Portfolio classes:

SEE BELOW

Bi-monthly large group meetings last year including attendance and topics:

All students were required to participate in the following (since the group is now so small, I combined Graduate Preparation and small group meetings):

| | |
|--------------|---|
| August 23 | First Scholars Meeting Overview of OK-LSAMP Attendance: 3/6 present; 2/6 excused; 1 absent |
| September 13 | Graduate School Preparation Effective Research Presentations Mike Heppler, Graduate College Attendance: 5/6 present; 1 absent |
| September 27 | Scholars Meeting Career Preparation Jenna Sampson, Career Center Attendance: 4/7 present 3 absent |
| October 11 | Graduate School Preparation Graduate School: Making the Decision Module Campus Coordinator Attendance 5/10 present; 2/10 excused; 3 absent |
| October 25 | Scholars Meeting Dr. Earl Mitchell Bridge to Doctorate Initiative Attendance: 5/10 present; 2/10 excused; 3 absent |
| November 15 | Scholars Meeting Retention Initiative for Student Excellence (RISE) Program 7/10 present; 1 excused; 2 absent |

November 29 Final Exam Preparation & Test Taking Skills
Campus Coordinator
Attendance: 6/10 present; 1 excused; 3 absent

Four students were added to the program late in September, thus the increase from 6 to 7 and then finally 10 attendees.

In the Spring, I lost two students. **Error! Contact not defined.** who graduated in December and **Error! Contact not defined.** who was not funded again in the spring. One new scholar was added late in the semester.

January 10 General business meeting
Attendance: 6/8 present, 1 excused, 1 absent

January 24 Jason White, Ph.D., Student Counseling Center,
Time Management and Organizational Skills
Attendance: 7/8 present; 1 absent

February 7 Erica Lewis, RISE Program
Attendance: 6/8 present; 2 absent

February 21 Kevin Gerfin, Financial Aid and Scholarships
5/8 present; 1 excused; 2 absent

March 7 Oklahoma Money Matters, Budgeting and Banking
6/8 present; 2 absent

March 21 Research Internship Program
5/8 present; 3 absent

April 4 Melissa Russel, Networking: Adding up the Connections
8/9 present; 1 absent

Small group meetings:

Through out the 2005-2006 academic year, I met one-on-one with Mirella Harrington and James Brown. We worked on Graduate Portfolios. In particular, they began researching graduate schools and developed and refined resumes and statements of purpose.

Mirella enrolled in and completed the online GRE Preparation classes. At the end of the Spring semester, Mirella informed me of her decision to delay graduation and remain as an undergraduate to pick up a minor in Spanish.

Southeastern Oklahoma State University Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

James Morel, Department of Biological Sciences, focused his research on an examination of the influence of detritivorous fish on other trophic levels in aquatic ecosystems. James also assisted a graduate student with her research dealing with reservoir fragmentation, and was co-author on a presentation given at two meetings.

Stormy Shoopman, Department of Biological Sciences, focused her research on the effects of reservoir fragmentation of fish communities.

Ricardo Lemus, Department of Physical Sciences, focused his research on the development of products for mosquito control.

Volunteerism:

James Morel and **Stormy Shoopman** volunteered to assist with research on fish- habitat relations in the San Juan River in Utah, collaborating with the US Bureau of Reclamation.

James Morel volunteered to assist with research on the effects of golden algae on reservoirs, in collaboration with University of Oklahoma Biological Station.

James Morel and **Stormy Shoopman** volunteered to assist with research related to determination of sampling effort to represent fish communities with electrofishing gear, with Southeastern Oklahoma State University.

Stormy Shoopman volunteered to assist with research related to nest box use and success by prothonotary warblers, in collaboration with the Tishomingo National Wildlife Refuge.

James Morel volunteered to serve as a summer intersession teaching assistant for a class in Reservoir Fish Ecology at the University of Oklahoma Biological Station.

Attendance of and presentations at professional society meetings:

Ricardo Lemus presented a student research poster at The 231st ACS National Meeting, Atlanta, GA, March 26-30, 2006, and also attended graduate school information and recruiting sessions.

James Morel was co-presenter of a paper at two meetings during fall 2005 and spring 2006: (1) the annual meeting of the American Fisheries Society, September 10-15, 2005, Anchorage, Alaska, and (2) the annual meeting of the Southern Division of the American Fisheries Society, February 8-12, San Antonio, Texas. He also attended a workshop for undergraduates on how to look for and get into graduate school, and attended a luncheon that paired students with professionals. His presentation was entitled "Changes in Reservoir Morphometrics and Fish Communities as a Result of Extensive Sedimentation in Lake Texoma, Oklahoma"

Facilitation of GRE test preparation and any financial assistance for the preparation:

Facilitation of the GRE included discussions during scholars meetings. We discussed the importance of the exam, where to take the exam, and how to prepare for the exam via various sources, including GRE prep modules and study guides. The GRE was not given a large amount of emphasis during AY 05-06 as only one student that was close to graduation indicated they were interested in graduate school. **Stormy Shoopman** graduated in May, 2006, and has begun work on a graduate degree at Southeastern Oklahoma State University.

Student meetings held last year, and the number of students who attended each meeting:

Sept. 2005: James Morel, Stormy Shoopman, Ricardo Lemus, Chase Condor.
Nov. 2005: James Morel, Stormy Shoopman, Ricardo Lemus, Chase Condor
Feb. 2006: James Morel, Stormy Shoopman, Ricardo Lemus, Chase Condor
Apr. 2006: James Morel, Stormy Shoopman, Ricardo Lemus, Chase Condor

Southwest Oklahoma State University Strategies Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Elizabeth Saladin did research at the Harvard Medical School summer 2005:

HO-1 Plays an Important Role in the Regulation of COX-2 Induction Following Endotoxin Exposure.
Elizabeth Saladin, Southwestern Oklahoma State University, Laura Fredenburgh, MD, Mark Perrella, MD, Harvard Medical School, Brigham and Women's Hospital, Boston, MA.

She presented her findings at the following:

National Conference on Undergraduate Research, Asheville, NC, April 14-16, 2006.

Biomedical Science Careers Program/ New England Science Symposium, Harvard University. Boston, MA, March 3-5, 2005.

10/6/05 – 10/8/06
Present research and OKAMP at National meeting, Las Cruces, NM

9/16/06
Present research and OKAMP at state, STILLWATER, OK

Also at SWOSU Chemistry Club and Biology Club monthly meetings

She is now in a MD/PhD program at Howard University, expected graduation 2013.

Student meetings held during the 05-05 year, and the number of students who attended each meeting:

Since Elizabeth was my only active student fall 2005, we would meet at least once a week to discuss our presentations, applications to graduate school, and SWOSU course work.

Spring 2006 saw Elizabeth and I continuing our minimum weekly meetings, but I also recruited Cammi Valdez to replace Elizabeth. Cammi and I met only once a week during the spring. Cammi did research at the University of Oklahoma this past summer:

Heme deficiency downregulates expression of exocrine pancreas genes in zebrafish

Cammi Valdez, Qingchun Zhou, and Han Wang

Department of Zoology and Stephenson Research and Technology Center
University of Oklahoma, Norman, OK 73019

This will increase now that she is the primary OKAMP participant. I plan to recruit one more this fall.

Tulsa University Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

- Carpenter Zachary Scott: Research on Robotics. Gave talk at OK-LSAMP and New Mexico, LSAMP. He also gave talks on his research at AISES, AAEE and EEE. Graduated in fall 05. Started Graduate School in spring 05.
- Gary Steven: Research on Noise Reduction for Leaf Blowers. Gave talks at ASME and won 1st place in student paper competition.
- Burks Christa: Research on Web browser applications. Gave talks at OK-LSAMP and New Mexico, LSAMP. Also gave a talk at NSBE region 5 and won 1st place the student paper competition.
- Butler Matthew: Research on secure Linux. Gave talk at OK-LSAMP and New Mexico, LSAMP. He also gave a talk at AISES.
- Carpenter Christopher Neal: Research on Robotics. Gave a talk at EEE and won 1st place in student paper competition. Graduated in spring 05. Started Graduate School in fall 06.
- Kusi Avis: Research initiation.
- Matlock Matthew: Started in summer 06. His research is in Autonomous Agents and also in computer animation.
- Palmer Courtney: Started in summer 06. Research in Robotics.
- Rainwater Scott: Started in summer 06. Research in Robotics.

Student meetings held during the 05-06, and the number of students who attended each meeting:

Fourteen biweekly meetings were held in the fall and spring. Five (5) meetings were held in the summer. Exact dates are: 8/26/05, 9/9/05, 9/23/05, 10/7/05, 10/21/05, 11/4/05, 11/18/05, 12/2/05, 1/27/06, 2/10/06, 2/24/06, 3/24/06, 4/7/06, 4/21/06, 6/30/06, 7/7/06, 7/21/06, 7/28/06, and 8/4/06.

The average number of participants at each the meetings is 13.

University of Central Oklahoma Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Mr. Amir Isbell – Amir has been one of UCO's role models for all of our students. He graduated in May, 2006 with a BS in Biomedical Engineering and began a post-baccalaureate program at the Mayo Clinic College of Medicine in Rochester, Minnesota. Amir will then enter an MD/PhD program in biomedical science. During this year, Amir conducted significant research resulting in one article publication, with two other submissions for publication. He also presented his research at the National Sigma Xi Meeting, the Oklahoma Posters on the Hill, and the OKAMP Symposium.

Ms. Uduak Williams – Uduak has been one of UCO's silent stars. She is a Senior in Biology. This past summer she enjoyed a summer research internship at the MD Anderson Cancer Center in Houston, Texas. As a result of her research, she wrote a paper with her mentor, Dr. Patrick Dougherty.

A change in the approach from group meetings to more individualized meetings:

The concept of individualized meetings with students was the ideal approach for the commuter campus nature of UCO. While having individual meetings with each student was much more labor intensive for me, it was much more fulfilling for me personally, and, I believe, much more successful for the students. I was able to have genuine relationships with the students, meet some of their families and discuss their future academic, career and personal plans.

I believe that as a direct result of this change to individualized meetings, we were able to assist Amir Isbell to where he is today – following his dream of biomedical research at the Mayo Clinic. Amir has been our most successful OKAMP student to date and we are very proud of him.

I have continued having individualized meetings with students this Fall, 06 semester.

University of Oklahoma Strategies for Fall 2005 – Summer 2006 Academic Year:

Research Activities:

Parker Berry
Effects on Electron Diffusion due to the Incorporation of Single Walled Nanotubes
Mentor, Dr. Robert Rennaker.

Felix De La Cruz
A composite material made from epoxy resin and graphite fibers in a unilateral direction. The laminade as it is also called is subjected to stress analysis before and after being heat treated and after moisture absorption.
Mentor, Dr. Cengiz Altan

OSU Research Day September 2006-Paper Presentation The Effects of Heat Exposure on Mechanical Properties and Absorption Characteristics For Fiber Reinforced Polymeric Laminates.

Jacob Henderson
Aviation Collision Risk Modeling
second place in the design competition at the IEEE regional conference in 2005
Mentor, Dr. John Fagan

Tyler Hicks
Designing and implementing an embedded digital signal processor for converting high speed analog signals from a photomultiplier tube in order to obtain fluorescence lifetime measurements used to characterize molecules.
Mentor, Dr. Mark Yeary

T. Hicks, "Distributed and Undersampled Successive Approximation Analog to Digital Conversion for Fluorescence Lifetime Measurement", Region 5 IEEE Undergrad. Paper Competition, Invited Paper, April 2006.

Cory Jones
Developing software for use by Tulsa Para-transit system
Designing a Graphical User Interface
Mentor: Dr. Sridhar Radhakrishnan

Shamara Manora
The research includes minimizing the onset of precipitation in surfactant solutions. Mentor, Dr. John Scamehorn

Shawn McCarroll – Advanced OPUP System
Designing and implementing an embedded digital signal processor for converting high speed analog signals from a photomultiplier tube in order to obtain fluorescence lifetime measurements used to characterize molecules.
Mentor, Dr. Mark Yeary

Robert McClure
Learning about the fine points of the university's profilometer, or surface profiler unit
Mentor, Dr. Matthew Johnson

Brad Porter
Researching possibilities of algorithms used in robotics to apply to Artificial Intelligence in video game personalities and vice versa

Mentor, Dr. Dean Hougen

Joel Ramey

Description of Research Photolithography templates for lab on chip

Mentor, Dr. David Schmidtke

Jacob Tarver

Investigation into tether/microparticle deposition under neutrophil cell rolling conditions (cell adhesion)

Mentor, Dr. David Schmidtke

Justin Woody

Coat/test redox biosensors with/without single walled carbon nanotubes

1st author - Analytical Chemistry – Under Review

Effects on Electron Diffusion due to the Incorporation of Single Walled Nanotubes

Mentor, Dr. David Schmidtke

All OU OKAMP Scholars were to research at least 5 universities concerning their graduate school requirements:

Scholars were made aware of announcements and e-mails from graduate programs throughout the academic year. Each year, there is a graduate and professional school fair hosted by the University of Oklahoma, and the scholars are encouraged to participate. Scholars discuss the graduate program at the University of Oklahoma (and other institutions) with their research mentor.

Beginning the 2006-2007 academic year, scholars will be asked to keep a log of information on entrance requirements and program offerings of university graduate programs they investigate.

Jacob Tarver and Joel Ramey investigated at least 5 graduate programs. All others investigated 1-4 graduate programs.

Familiarizing scholars with the National Consortium for Graduate Degrees for Minorities in Engineering and Science, Inc. and their fellowship programs:

Interim Diversity Coordinator held an information session for LS AMP scholars to meet with GEM and McNair Scholars program participants. LS AMP Scholars were also made aware of the Bridge to Doctorate program and their eligibility.

Student meetings held during the Spring semester, and the number of students who attended each meeting:

All scholars had regular contact with Campus Coordinator regarding their research. In addition, the LS AMP scholars attended meetings and development opportunities regarding grad school funding, resume writing skills, and research experiences.

McNair Scholars program cooperation with the OK-LSAMP program this semester:

The Scholars were informed about McNair and GEM through email and an informational program. Several LS AMP scholars applied and became McNair or GEM scholars.

New Initiative:

Director of Diversity, programming for AMP scholars. One of the key responsibilities of the Director of Diversity is to mentor AMP scholars and encourage them to pursue graduate degrees in the STEM fields. Another responsibility is to provide tutoring assistance for engineering students including LSAMP scholars to ensure academic success.

As academic success is necessary for prospective graduate students, additional supports will be in place for the Scholars program this year. Scholars have available free tutoring services. Those who are in jeopardy of falling below a 3.0 will be tracked for academic success and additional interventions will be considered.

Examination of LS-OKAMP Retention and Graduation Rates

In August 2006, C-IDEA published the seventh annual national STEM retention study, 2005-06 STEM Retention Report. This report was based on data collected from 188 colleges and universities, including all ten of the LS-OKAMP public universities. The retention data for ten of the ten institutions was provided by Assistant Director of State System Research Laura Tyree at the Office of the Oklahoma State Regents for Higher Education. The data for Oklahoma State University was provided directly from its Institutional Research Office. The University of Tulsa is not included in the report of retention and graduation rates.

The STEM survey focused on retention and graduation data for freshman cohorts from 1998 through 2004. The following report is based on a subset of data obtained for the ten Oklahoma public institutions.

The executive summary information below addresses the issues related to gender and the status of underrepresented STEM students. It also includes observations on the status of STEM retention and graduation at the LS-OKAMP institutions as compared to the overall status of STEM retention observed in the 2005-06 STEM survey of 188 higher education institutions. Unless otherwise noted, the rates in the following section are the overall rates for the period 1998-2004.

Demographics

Overall Freshman Enrollment

During the survey period 1998-2004, underrepresented minority students (URM) comprised 21.3% of the first-time, full-time enrollments at LS-OKAMP institutions as compared to 18.3% of the enrollments across all of the 188 STEM survey institutions. Among STEM survey institutions, Hispanics accounted for 7.5% of the freshman enrollments during this period, American Indian students accounted for 1.0% and Blacks for 9.8%. In contrast, at LS-OKAMP institutions the percentage of first-time full-time Hispanic and Black students were somewhat less of the total freshman enrollment; 2.9% and 6.9 % respectively. Not surprisingly, American Indian students accounted for 11.4% of the freshman enrollments in the LS-OKAMP institutions.

Underrepresented Minority STEM Majors

In the 2005-06 STEM survey, we found that approximately 24% of the over 2 million first-time freshman enrolled in 188 public colleges and universities during the survey period intended to pursue STEM majors. Within the ten Oklahoma public institutions participating in the LS-OKAMP study, 18% of the 83,000 first-time full-time freshman intended to be STEM majors.

Looking specifically at the enrollment of freshmen who intend to be STEM majors, one finds that a higher percentage of underrepresented minority students (20.8%) made up the freshman STEM cohorts at LS-OKAMP institutions than made up the freshman STEM cohorts at the STEM survey institutions (17.6%). It is interesting to note that at LS-OKAMP institutions, the percentage of URM students enrolling in STEM fields was greater than their percentage of representation in the general population of all first-time freshmen.

Gender and STEM Majors

Women comprised a majority of the first-time, full-time freshman cohorts of both the LS-OKAMP institutions (53.4%) and the STEM survey institutions (54.2%). However, women made up a smaller percentage of the freshman cohorts who intended to major in a STEM field at both LS-OKAMP and the STEM survey institutions (37.4% and 36.7% respectively).

Comparison Tables

The tables below compare the most recent 6-year graduation rates and the most recent 2nd year continuation rates of underrepresented minority students for the individual LS-OKAMP institutions and the STEM survey institutions. In order to provide another perspective for comparison, these tables compare the individual institution to the overall rates of institutions with similar selectivity with regard to admissions requirements for ACT/SAT scores. Historically, as shown in **Table 5**, the 6-year graduation rates of URM STEM majors who begin in STEM and graduated within STEM while attending the LS-OKAMP public institutions have been greater than or equal to the national 6-year graduation rates observed in the CSRDE STEM studies for the URM cohorts of 1994 through 1999, except for 1997 when it was slightly lower. The figures below are rounded.

Table 5

| 6-year Graduation Rates for URM STEM Majors within STEM fields | | |
|---|--------------------------------------|--------------------------|
| | All STEM Participant Institutions | LS-OKAMP Institutions |
| 1994 | 24% | 24% |
| 1995 | 25% | 27% |
| 1996 | 24% | 27% |
| 1997 | 24% | 23% |
| 1998 | 26% | 26% |
| 1999 | 25% | 30% |

Table 6

| 1999 Freshman Cohort six-year graduation rates of underrepresented minority students who began as STEM majors and continued in ANY MAJOR or continued within a STEM major at institution | | |
|---|-----------|------------|
| Comparison of LS-OKAMP institutions with overall STEM rates by selectivity | | |
| | Any major | STEM major |
| Highly Selective STEM Institutions | 55.7% | 32.9% |
| OU | 54.3% | 37.4% |
| Selective STEM Institutions | 44.1% | 20.4% |
| OSU | 47.0% | 32.5% |
| Moderately Selective STEM Institutions | 37.9% | 21.5% |
| Southeastern Oklahoma State U | 29.1% | 20.8% |
| UCO | 26.6% | 6.6% |
| Less Selective STEM Institutions | 31.7% | 20.1% |
| Cameron U | 14.2% | 10.7% |
| East Central U | 37.8% | 18.9% |
| Langston U | 63.6% | 54.5% |
| Northeastern State University | 33.3% | 33.3% |
| Northwestern Oklahoma State U | 0% | 0% |
| Southwestern Oklahoma State U | 30.7% | 7.6% |
| Overall 1999 STEM institutions | 43.7% | 25.3% |
| LS-OKAMP institutions | 40.7% | 27.6% |

Table 6 examines the six-year graduation rates of URM first-time full-time STEM majors in the cohort of 1999. Graduation rates in this table are reviewed in two ways.

- Any Major –Any Major identifies the percent of URM students who began as freshman STEM majors and graduated within six years in any major at their institution.
- STEM Major- The STEM Major column identifies the percent of the URM students who began as freshman STEM majors and graduated specifically within a STEM field.

As shown in Table 6, four of the nine LS-OKLAMP public institutions had higher six-year graduation rates for the 1999 cohort of URM STEM majors who remained in STEM than did all other institutions participating in the CSRDE STEM study with similar selectivity. These institutions included The University of Oklahoma, Oklahoma State University, Langston University, and Northeastern State University.

Retention Rates

The on-going challenge faced by the LS-OKAMP institutions has been retention. The LS-OKAMP institutions historically show lower retention of URM students within the STEM fields when compared with all other STEM participating institutions, as can be seen in Table 7. However, while the rates for the entire group of STEM participating institutions gone down slightly over time, the LS-OKAMP institutions have improved from a low of 49% first year retention of URM students within STEM to 57.1% first-year retention over the course of 1997-2004. This is significant improvement overtime.

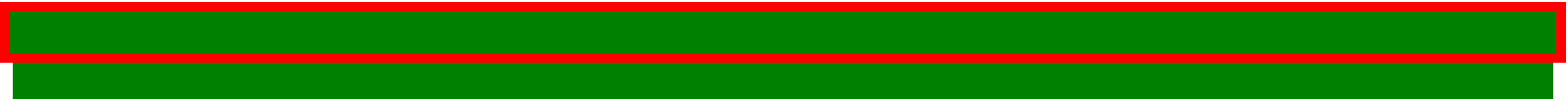


Table 7

**2nd Year Continuation Rates of URM
STEM Majors continuing in STEM
fields**

| | All STEM Participant Institutions | LS-OKAMP Institutions |
|------|--|----------------------------------|
| 1997 | 65.1% | 49.0% |
| 1998 | 64.8% | 54.6% |
| 1999 | 64.2% | 56.7% |
| 2000 | 64.7% | 55.2% |
| 2001 | 63.0% | 57.0% |
| 2002 | 62.9% | 50.5% |
| 2003 | 63.9% | 63.5% |
| 2004 | 63.5% | 57.1% |

Table 8 examines the retention of URM first-time full-time STEM majors in the cohort of 2004. Retention in this table is reviewed in two ways.

- Any Major –Any Major identifies the percent of URM students who began as freshman STEM majors and continued to the second academic year, regardless of their major.
- STEM Major- The STEM Major column identifies the percent of the URM students who began as freshman STEM majors and remained specifically in STEM fields as they moved into the second year.

As can be seen in Table 8, the most recent retention rates indicate that many LS-OKAMP institutions lag behind the other STEM survey institutions both in retention of initial STEM majors in any field and of particular interest to this project, in retention with STEM fields. There are three partners however, that may have lessons to share with the rest of the group, Oklahoma State University, Langston University, and Northwestern.

Table 8

| 2004 Freshman Cohort 2nd Year Continuation Rates of underrepresented minority students who began as STEM majors and continued in either ANY MAJOR or in a STEM major at institution | | |
|---|------------------|-------------------|
| Comparison of LS-OKAMP institutions with overall STEM rates by selectivity | | |
| | Any major | STEM major |
| Highly Selective STEM Institutions | 84.4% | 69.8% |
| OU | 87.8% | 64.2% |
| Selective STEM Institutions | 79.4% | 64.3% |
| OSU | 81.1% | 70.0% |
| Moderately Selective STEM Institutions | 72.6% | 58.4% |
| Southeastern Oklahoma State U | 61.7% | 32.3% |
| UCO | 65.2% | 52.1% |
| Less Selective STEM Institutions | 69.0% | 58.4% |
| Cameron U | 42.4% | 36.3% |
| East Central U | 71.7% | 53.8% |
| Langston U | 75.9% | 59.9% |

| | | |
|--------------------------------|-------|-------|
| Northeastern State U | 75.0% | 75.0% |
| Northwestern Oklahoma State U | 80.0% | 60.0% |
| Southwestern Oklahoma State U | 42.9% | 21.4% |
| Overall 2003 STEM institutions | 77.4% | 64.1% |
| LS-OKAMP institutions | 74.4% | 57.1% |

Summary

Underrepresented minority STEM students in the LS-OKAMP institutions graduate within STEM and within six-years at rates equal to or better than the average six-year graduation rates of all other institutions participating in the CSRDE STEM study. The first-year retention rate of URM students within STEM fields attending LS-OKAMP schools has risen from improved from a low of 49% for the cohort of 1997 to 57.1% for the cohort of 2004. This places the LS-OKAMP institutions within reach of the overall average first year retention of all CSRDE STEM participants. It also represents a 13% increase over the retention rate for the cohort of 2004.

Interestingly, URM students who begin as STEM majors within LS-OKAMP institutions have higher first-year retention rates and six-year graduation rates than their URM peers who began in non-STEM fields. URM students who begin as STEM majors and then change to a non-STEM field appear to have the ability to perform college work. How can they be encouraged and supported to continue their work in a STEM field? Is it possible they could be re-directed into a different STEM field than the one they pursued originally?

URM students at the LS-OKAMP institutions who began as STEM majors graduated within six years and within STEM fields at rates comparable to the average rates of URM students attending all CSRDE STEM institutions. However, an average six-year graduation rate of 27.6% of URM students within STEM fields means that approximately 73% of students who began as STEM majors either changed majors or left college. So here again, there continues to be work to do.

The LS-OKAMP project is specifically attempting to address these issues. Over the course of the project the LS-OKAMP institutions have attempted to support URM students as they move through their academic undergraduate careers as STEM majors. We are seeing the results of this sustained effort both in the graduation rates and in the improved first-year retention rates over time. Additional achievement can be seen within the cohort of LS-OKAMP Phase III students. **Of the 29 graduates during the Fall, Spring and/or Summer of 2005-06, 55% (16 students) were identified as having been admitted to graduate school.** This is again a testament to the quality of the students and the faculty mentorship they receive in the program.

Recommended areas for improvement for the coming year

Despite the strong performance of the program, there are two areas which merit discussion and movement for improvement in the next year. The first area of concern has to do with research activities and Graduate Preparation. The number of upperclassmen in the LS-OKAMP program who participated in research decreased from 100% last year to 57% during 2005-06.

Corrective Action: This is a significant slippage. It is possible that the issue is not reporting fully rather than a lack of research opportunities for students. Research and the mentorship that comes with it are proven interventions that keep students engaged in school and in STEM. I would recommend that the Program Coordinator contact each Partner before the end of this current semester to see how they are moving along this year on finding research opportunities for their students. The expectation is that all Juniors and Seniors should have research opportunities each year.

Table 9: Completion of Online GRE Prep Course

| Institution | No | NA | Yes | Total |
|-------------|----|----|-----|-------|
| CU | 7 | | | 7 |
| ECU | | 11 | | 11 |
| LU | 2 | 1 | 6 | 9 |
| NEOSU | 5 | | | 5 |
| OSU | 6 | 2 | 1 | 9 |
| OU | 12 | 1 | 3 | 16 |
| SEOSU | 4 | | | 4 |
| SWOSU | 2 | | | 2 |
| Tulsa | | 2 | 1 | 3 |
| UCO | | 4 | | 4 |
| Total | 38 | 22 | 11 | 70 |

The second area of concern has to do with graduation preparation strategies such as GED preparation, GRE testing, the minimum suggested graduate applications and summer field research which are not being implemented with much success. For example, as shown in Table 9, only 11 of the 70 students (16%) took the online GRE prep course sponsored by the OSU-OKC campus. The

cost of this course is covered by the LS-OKAMP program office, so this represents a little used support for students that might help dispel the anxiety of taking the GRE. Approximately one half of the students that took the GRE online prep were admitted or were in the process of applying to graduate school. Also, only 14% of the students used the Graduate School prep modules developed by the Program office. Again, another resource available without cost to the participants that is going unused. It is apparent that the Alliance had achieved good success this past year in its attempt to develop STEM graduates and graduate school candidates. It is unknown whether these additional unused supports would have been useful to those students that did not apply for graduate school.

Corrective Action: It is recommended that the goals for the next year be modified to reflect specific targets for student participation in these supportive activities. A target of at least 50% participation does not seem unreasonable. The Program Coordinator should communicate this to the partners.

Respectfully submitted by:

Rosemary Hayes, Ph.D.
NSF LS-OKAMP Program Evaluator
The University of Oklahoma

OUTREACH ACTIVITIES

Articulation Agreements with Community Colleges

The Oklahoma State Regents for Higher Education articulation agreement and policy “guarantees transferring students successfully completing Associate in Science or Associate in Arts degrees that their lower division general education course requirements are satisfied.” Oklahoma State University has the Northeastern Oklahoma College at Oklahoma State University Gateway Program (NOC - OSU) located at NOC’s Stillwater campus. Students who have applied for freshman admission to OSU but do not meet current admission requirements do qualify for admission to the NOC-OSU Gateway Program. Gateway courses transfer as equivalent to specific OSU courses and meet general education requirements just as they would if taken at OSU.

For the last three summers, Dr. Lewis, Campus Coordinator, Langston University has hosted between 2-6 high school students in her lab during the month of June in cooperation with the Research and Engineering Apprenticeship Program.

PUBLICATIONS

none

BRIDGE TO DOCTORATE PHASE III SUPPLEMENT

In July 2004, the Oklahoma Louis Stokes Alliance received funding for a Bridge to Doctorate program at Oklahoma State University. Currently there are 12 participants. The following year, the University of Oklahoma became the second BD site in the Oklahoma Alliance.

Academic Progress, Activities, Awards, and Recognitions of the OSU BD Students

Barrett, Dominic, Masters student Zoology, Fisheries and Wildlife Ecology has completed his plan of study and to date has completed the appropriate coursework as outlined on his Plan of Study. He has submitted his research proposal to his committee and is involved in rigorous field study.

In the past year Dominic:

- Gave a presentation entitled *River Otter (Lontra Canadensis Distribution and Current Research in Oklahoma* at the 94th Annual Technical Meeting of the Oklahoma Academy of Science, Oklahoma City University, Oklahoma City OK, November 5, 2005.
- Received the Graduate Student Fisheries Involvement Award, January 2005

Cowan, Brett - Doctoral student in Civil Engineering has completed all coursework as outlined on his Plan of Study, has passed his Qualifying Exam, and his proposal has been accepted by his committee as of March 30, 2006. He plans to graduate with a Ph.D. in December 2006 or May 2007, depending on completion of research, preparation of thesis, and review and acceptance by his committee.

Cowan-Watts, Cara - Doctoral student in Biosystems and Agricultural Engineering has completed 24 hours of coursework with an overall GPA of 3.875 and is making “excellent” progress on defining her dissertation topic.

Heppler, Marty - Masters student in Entomology and Plant Pathology, has completed most of her courses on her Plan of Study and is currently enrolled in the last three courses. Marty is making steady progress on her research and thesis and anticipates graduating in Spring or Summer 2007. This year Marty also:

- Made a presentation entitled *Role of Glandular-haired Trichomes in Resistance of Alfalfa to the Potato Leafhopper* at the Integrated Pest Management Student Symposium, Oklahoma State University, Stillwater OK, April 25, 2006
- Attended the annual meeting of the Southwestern Branch of the Entomological Society of America (SWBESA) in Austin TX, February 27-March 2, 2006
- Presented poster *Mortality to aphids fed Serratia marcescens, the causal agent of Cucurbit Yellow Vine Disease* at the Entomological Society held in Fort Lauderdale FL, November 5-10, 2005
- Member of APS Joint Committee of Women in Plant Pathology & Cultural Diversity, Fall 2005-2008
- Treasurer of OSU Sanborn Entomology Club

Manjarrez, Jacob - Doctoral student in Biochemistry and Molecular Biology, despite previous health challenges, has completed most of his course work as outlined on his plan of study and anticipates completing the rest by Spring 2007. Additionally Jacob trained and provided oversight of two undergraduate interns during the summer of 2006. Jacob started his Qualifying Exams in fall 2006. His anticipated graduation date is 2009.

Patten, Thomas - Doctoral student in Electrical Engineering has completed most of his coursework as outlined in his Plan of Study and is currently working on his research.

Peal, Lila - Masters student in Biochemistry and Molecular Genetics expects to be completed with her coursework by Spring 2007 and to complete her Qualifying exams and Thesis proposal defense by Summer 2007. Her anticipated graduation date is December 2008. Lila is treasurer of the Biochemistry and Molecular Biology Graduate Student Association (BMBGSA).

Rush, Loretta - M.S. student in Plant Pathology has completed all required coursework and is currently finishing her research project. Her anticipated graduation date is Fall 2006. Other activities Loretta has been involved in are:

- Attended an NSF Grant Writing Workshop in Ardmore OK, September 14, 2005
- Presentation entitled *Bridges to Roots: Fire on the Prairie*, East Central University, Ada OK, February 2006
- Presentation entitled *Role of the Mi Gene in Conferring Resistance to the Root-knot Nematode in Tomato Cultivars*, Integrated Pest Management Student Symposium, Department of Entomology and Plant Pathology, Oklahoma State University, Stillwater OK, April 25, 2006

Sherman, Adrian - Masters student in Biosystems and Agricultural Engineering has completed his first year of coursework, selected a graduate committee and is working on a Plan of Study and a Prospectus for his research.

Singleton, Nicole - Masters student in Physiological Sciences (Toxicology) formed a graduate committee, completed and an approved Plan of Study and is working steadily on her courses and her research project. Nicole and Dr. Carey Pope, her Faculty advisor/mentor gave a presentation entitled: *Effects of Intracerebroventricular Infusion of a Muscarinic M2 Agonist on Organophosphate Toxicity in Rats*, Phi Zeta Research Symposium, Veterinary Health Sciences Center, Oklahoma State University, Stillwater OK, March 31, 2006

Wilkins, Brek - Doctoral student in Biomedical Sciences, Oklahoma State University Center for Health Sciences, Tulsa, OK has formed his committee and completed an approved plan of study. Brek continues to work on his research and is refining dissertation questions. In March Brek gave a poster presentation entitled *Early Detection of Diabetic Neuropathy in Native Americans* at the National Science Foundation Joint Alliance Meeting, Washington DC.

Wright, Christee - Masters student in Microbiology and Molecular Genetics has completed all her coursework toward her Masters degree based on her plan of study. She has is in the final stages of her research and has written a draft of her thesis. She expects to defend in October 2006, and her anticipated graduation date is Fall 2006. In May 2006 Christee made a presentation entitled *Isolation and Expression of a Putative FMN-Dependent NAD(P)H Azoreductase in Clostridium Perfringens*, American Society of Microbiology, Orlando FL, May 2006

University of Oklahoma Bridge to Doctorate Student List

Harris, Steven - BS Institution: Langston University; Major: Chemistry; Career Goals: to continue research in the vibrant academic atmosphere.

Harvey, Desmond - BS Institution: Langston University; Major: Chemistry; Career Goals: to set up a laboratory for the production, testing and research of new drugs.

Henderson, Jacob - BS Institution: University of Oklahoma, Major: Computer Science; Career Goals: to become a professor in order to expand the knowledge of future generations.

Hughes, Quintin - BS Institution: University of Oklahoma; Major: Industrial Engineering,

James, Kevin - BS Institution: Southern University and A&M College, Lake Charles, LA; Major, Computer Science; Career Goals: to be a professor at an institution where he can conduct research, establish programs for less privileged minorities, and be a mentor to students needing guidance.

McCarroll, Shawn - BS Institution: University of Oklahoma; Major: Computer Science; Career Goals: to learn more and share it with others particularly through research and teaching.

McCutchen: Marshall - BS Institution: East Central University; Major: Physics; Career Goals: to become a research physicist and to make important contributions to the scientific community.

Osisanya, Isreal - BS Institution: University of Oklahoma; Major: Chemical Engineering; to give back to his own community through teaching and mentoring of prospective minority students or professionals in his specific area of interest.

Rowland, Marquita - BS Institution: Langston University; Major: Biology; Career Goals: to advance the field of medical research.

Vazquez, William Joseph - BS Institution: Cameron University; Major: Mathematics; Career Goals: to teach at a University and/or work as a contracted researcher.

Wallace, T'Aire – BS Institution: Langston University; Major: Chemistry; Career Goals; to conduct research in a microbiology as a university professor or with a major corporation.

Heath Work - BS Institution: University of Oklahoma, Major: Bioengineering; Career Goals: to advance the field of medical research including biomedical products that particularly affect the Native American community.

10 of the 12 BD students at OSU and 7 of the OU BD students served as hosts, presenters, and/or facilitators at the Oklahoma LSAMP 2006 Annual Research Symposium.

Dominic Barrett, Brett Cowan, Marty Heppler, Jacob Majnarrez, Thomas Patten, Lila Peal, Loretta Rush, Adrian Sherman, Nicole Singleton, Brek Wilkins, and Cristee Wright from OSU and Quentin Hughes, Kevin James, Marshall McCutchen, Israel Osisanya, William Vasquez and T'Aire Wallace from OU attended the 2006 NSF Joint Annual Meeting, Washington DC