

2016 Annual Report

Kentucky-West Virginia
Louis Stokes Alliance for
Minority Participation
(KY-WV LSAMP)



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Kentucky-West Virginia Louis Stokes Alliance for Minority Participation

2016 Annual Report

Kentucky – West Virginia
Louis Stokes Alliance for Minority Participation
In Science, Technology, Engineering, and Mathematics
(KY-WV LSAMP STEM)

Submitted by

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INTRODUCTION

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation program (KY-WV LSAMP) is a nine institution alliance led by the University of Kentucky. Alliance members include: Bluegrass Community and Technical College (BCTC), Centre College, Kentucky State University (KSU), Marshall University, University of Kentucky (UK), University of Louisville (U of L), West Virginia State University (WVSU), West Virginia University (WVU), and Western Kentucky University (WKU). Alliance goals are to create, enhance, and expand programs designed to broaden participation and increase the quality and quantity of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics (STEM) disciplines. The alliance projects the following key outcomes: increase URM STEM BS degrees at alliance institutions by 50% for a total of 1,000 BS STEM degrees over five years. This will be accomplished by achieving increases in total alliance enrollments to 2000 average annually (a 25% increase) with similar increases in retention, transfer rate, graduation rates. These increases will also contribute to increases in application to and attendance in STEM graduate degree programs.

Each institution has developed programs consistent with LSAMP goals. Institutions have also, with the help of LSAMP, built sustainable partnerships within campus programs as well as with external (outreach) programs and organizations. Program activities and partnership resources focus on outreach and recruiting, peer mentoring, undergraduate research experiences, research presentation opportunities, summer bridge and transitional programs for entering students, curriculum reforms in “gatekeeper” courses, international experiences, and workshops on professional development and STEM career options.

The **intellectual merit** of the program is the increased knowledge base related to teaching and learning practices for STEM disciplines, practices for improved recruiting and retention, and the development of improved curriculum materials and practices for STEM disciplines. As Scholars pursue their degrees and participate in program activities, they develop the skills needed to succeed not only in their degree programs, but also in the professional community of their chosen field. They learn the skills necessary to be the leaders and experts. Scholars give and receive mentoring on multiple levels from middle school and high school students to world renowned researchers. In addition to increasing their knowledge and research skills, this multi-level mentoring also helps the Scholars to build excellent professional networks for current and future research, presentation, educational and professional opportunities. Often, the connections made through the LSAMP program guide Scholars to the next opportunity.

The **broader impact** is the increase in URM STEM BS degree production. This will broaden math, science, and engineering participation of underrepresented students from the two Experimental Program to Stimulate Competitive Research (EPSCoR) states and surrounding regions. Because of the skills developed and the connections made through LSAMP, Scholars are uniquely qualified for graduate programs and industry. Once receiving their BS degrees, many participants continue

into graduate programs. This will increase the diversification of the STEM workforce and broaden the participation of underrepresented students who seek and earn graduate degrees.

The increase in skilled workforce has the potential to significantly improve the competitive position of the two states and eventually to improve faculty diversity in STEM fields. In turn, participants will play key roles in educating their respective communities about STEM fields and encouraging younger students to pursue STEM disciplines. The multi-level mentoring gives Scholars a venue for serving as role models for future generations. For example, Dr. Astrid Suarez, former WKU Scholar, recently completed her Ph.D. in meteorology from Penn State University. She and others, with support from KY-WV LSAMP, continue to broaden participation of underrepresented persons in STEM fields.

There have been many changes in the KY-WV LSAMP program. Since the beginning of Phase II funding, Dr. JJ Jackson, UK VP for Institutional Diversity, served as the interim project director for KY-WV LSAMP. In April 2015, Dr. Jackson left the university. In June 2015, the project evaluator recommended the hiring of a new project director. Following Dr. Jackson's departure, plans to hire a project director were put into motion. A search committee (led by Dr. Parker, Co-PI) was created, and a nationwide search was conducted. The new project director began on October 1, 2015. Fara Williams, former Oklahoma LSAMP Data Coordinator, was hired as the project director. She brought with her eight and one half years of LSAMP experience and a dedication to the LSAMP program.



In 2016, a new logo was designed to represent the alliance. LSAMP is spelled vertically and the mountains that connect Kentucky and West Virginia are represented. This design is unique for quick and easy program recognition. It is expected to be used by Scholars throughout the alliance on presentations, including, but not limited to posters and papers. It will be used by coordinators and the program office for presentations as well as marketing material such as brochures and flyers. This logo was designed for longevity. There should be no need to alter or change the logo for years to come.

Once the logo was finalized, a new program brochure was created for use by the alliance. This brochure includes information on the benefits and requirements of KY-WV LSAMP as well as contact information for each campus. A copy of the brochure may be found in Appendix A.

PROGRAM PROJECTED OUTCOMES

The Kentucky-West Virginia Louis Stokes Alliance for Minority Participation consists of nine colleges and universities. Of these, there are comprehensive research universities, two historically black college and universities (HBCU), regional universities, and a 2-year college. Using knowledge learned from past successes paired with lessons learned from past failures, the alliance will continue to increase the number of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics disciplines. To accomplish this goal, the following objectives were proposed and have been met.

Projected Outcome One

To increase URM STEM BS degrees from 168 annual average to 250 annually for a total of 1,000 degrees over 5 years

In 2014-15, 244 URM STEM BS degrees were granted by KY-WV LSAMP institutions. This is a 45% increase from the 168 average used in the proposal and a 41% increase from the baseline year (173 degrees in 2006-07). Figure 1 shows the number of degrees from 2006-07 to 2014-15. The significant decrease in numbers from 2011-12 can be attributed (in large part) to incomplete data. The first funding period ended in October 2012, and there was a break in documentation and reporting before the current funding period began. Currently, complete and accurate data is not available for 2013 and 2014. Overall, there have been more than 1250 URM STEM BS degrees granted at KY-WV LSAMP institutions since 2006.

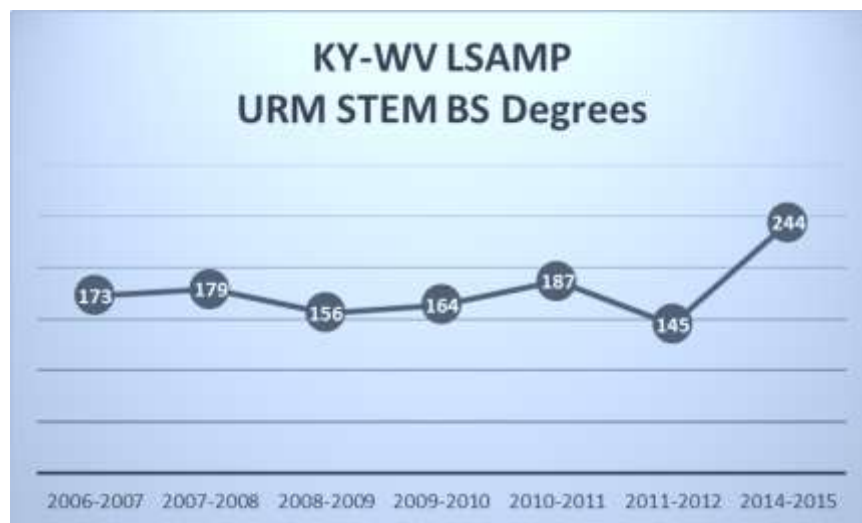


Figure 1: URM STEM BS Degrees Granted at KY-WV LSAMP Institutions

Projected Outcome Two

To increase URM STEM enrollments from 1599 to 2000 annual average

Traditionally, underrepresented (URM) populations targeted by the national LSAMP program (African American, Hispanic, Native American, and Pacific Islanders) represent an almost unique recruiting challenge for the KY-WV LSAMP institutions because of their unusually low percentages of the populations of the two states. Even though the URM population accounted for over 26% of the US population, they comprise only 16% and 6%* of the population in Kentucky and West Virginia, respectively.

Even with this challenge, the KY-WV LSAMP has been successful in increasing enrollments. In 2014-15, 2315 URM students were enrolled in STEM BS degree programs at KY-WV LSAMP institutions. This increase in enrollments surpasses the goal of 2000 per year and is an increase of 21% from the baseline year (1918 in 2006-07). Figure 2 shows the number of URM STEM enrollments at KY-WV LSAMP institutions since 2006. Like the decrease in degrees, the significant decrease in enrollments in 2011-12 can be attributed (in large part) to a break in documentation and reporting. Currently, data is not available for academic years 2013 and 2014.

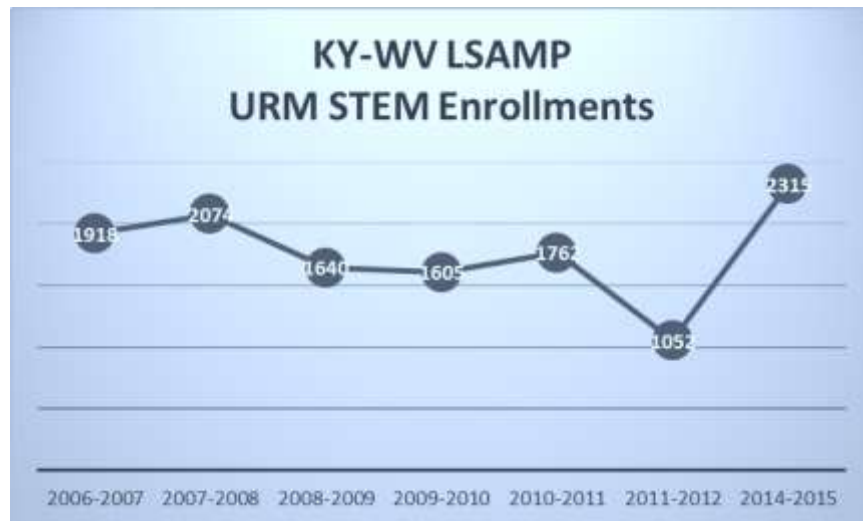


Figure 2: URM STEM Enrollments at KY-WV LSAMP Institutions

* Source of URM population data: Kaiser Family Foundation estimates based on the Census Bureau's March 2015 Current Population Survey (CPS: Annual Social and Economic Supplement).

Additional Important Outcomes

KY-WV LSAMP Participants

In order to meet program goals of increasing URM STEM enrollments and degrees, KY-WV LSAMP must strive to increase the number of students who participate in program activities and receive program benefits. The increase in program participants (Scholars) should result in a ripple effect that increases the number of students earning STEM degrees not only at the partner institutions, but throughout the entire region including all of West Virginia and Kentucky. This is demonstrated in Figure 3. **Directly Funded Scholars** receive direct LSAMP financial support (such as stipends, tuition aid, textbooks, conference travel, etc.) *and* participate in program activities. **Unfunded Scholars** do not receive direct LSAMP financial support but are documented as being accepted into the program *and* participating in program activities. **Non-Scholar Participants** have not been formally accepted into the program but participate in one or more program activities (such as attending Scholar Meetings and research symposia). **Influenced Students** have no direct connection or communication with program staff or participation in program activities but may be influenced and/or mentored by friends and/or family who do. The ending result is an increase in URM, STEM, and undergraduate research programs and participants throughout the alliance and the region.

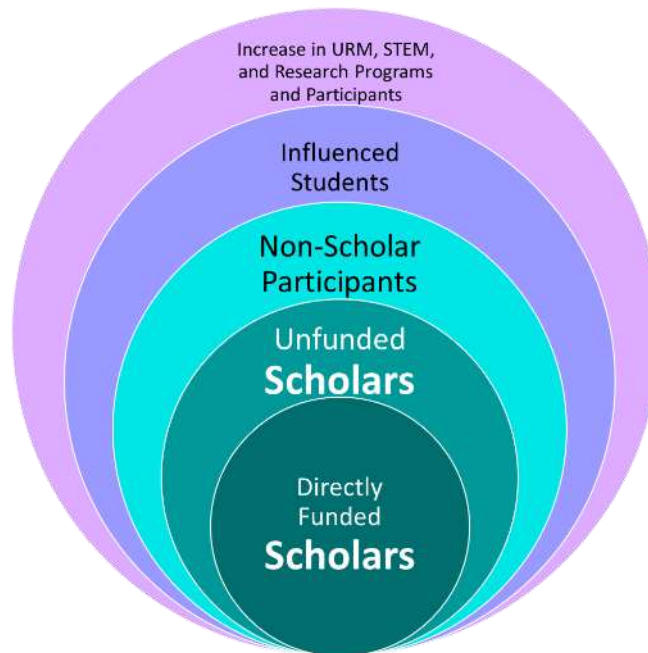


Figure 3: Graphic Representation of the KY-WV LSAMP Ripple Effect

In 2014-2015, KY-WV LSAMP supported 162 Scholars at nine institutions. In 2015-2016, the number of Scholars increased to 200 - a 23% increase. With recent changes in program staff and improvements in communications and sharing of best practices, there is renewed energy in the alliance. This should result in a jump in the number of participants as well as the level of participation in program activities in 2016-2017. Figure 4 shows the number of KY-WV LSAMP participants each year.

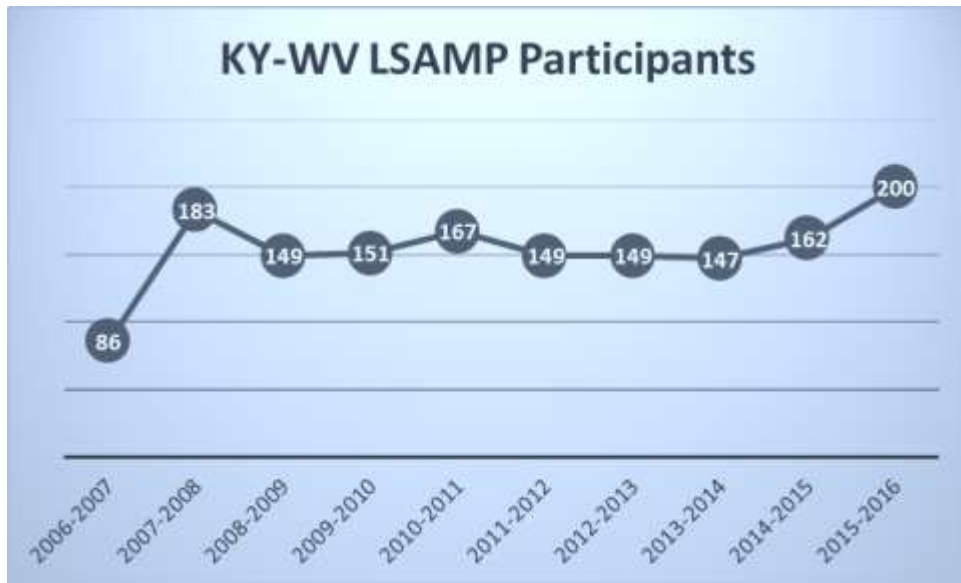


Figure 4: Number of KY-WV LSAMP Participants by Year

PROGRAM ACTIVITIES

Continued Activities

Research with Faculty Mentors

KY-WV LSAMP Scholars are highly involved in research projects. Many Scholars participated in research during the academic year, and some conducted research during a summer internship. These research projects led to over 50 presentations at local, state, regional, and national conferences. These conferences included, but were not limited to: the Kentucky Academy of Sciences Annual Meeting, the LSAMP 25th Anniversary Research Symposium, Kentucky Posters at the Capitol, West Virginia Research Day at the Capitol, the KY-WV LSAMP Annual Research Symposium, the National Conference on Undergraduate Research, and the American Chemical Society National Meeting. Table 1 shows the number of documented presentations by type and institution.

Table 1: Number of Presentations Made by KY-WV LSAMP Scholars by Type and Institution

	Local	State/Regional	National	International	TOTAL
BCTC	0	0	0	0	0
Center	3	3	0	0	6
KSU	3	7	5	0	15
Marshall	0	0	0	0	0
UK	2	4	4	0	10
U of L	0	5	0	0	5
WVSU	0	0	0	0	0
WVU	0	11	0	0	11
WKU	0	2	2	0	4
TOTAL	8	32	11	0	51

Annual Research Symposium

The 2016 KY-WV LSAMP Annual Research Symposium was held on April 2, 2016. Fifty-nine faculty, staff, students, and others attended. Sixteen Scholars made poster presentations. Raymond Burse, President of Kentucky State University, presented the keynote address. In addition, Dr. Rynetta Davis, professor at the University of Kentucky, provided the Scholars and other attendees a professional development session on written communication. The cover of the program and photos can be found in Appendix B.

KY-WV LSAMP has begun collaborating with the Ohio LSAMP in order to plan a joint research symposium for spring 2018. This will be a celebration of LSAMP excellence for 10 years in Kentucky and West Virginia. It will be an extensive event with Scholar presentations and renowned speakers as well as professional development sessions. An event proposal will be submitted to the National Science Foundation for conference funding.

Academic Preparation Bridge Programs

Though the KY-WV LSAMP program does not directly fund or host a summer bridge program for incoming freshmen, LSAMP partners with departments and programs that offer summer bridge activities and other URM STEM activities. Each campus has partnerships with programs and organizations with like goals and objectives. Campus Coordinators collaborate with those programs and organizations in order to recruit and support a larger number of participants and better leverage the money provided by the National Science Foundation for LSAMP activities.

In addition, there are alliance partnerships. There is a partnership with NASA Kentucky to provide scholarships to KY-WV LSAMP participants. The Kentucky and West Virginia Experimental Programs to Stimulate Competitive Research (EPSCoR) offer support for LSAMP Scholar research during the academic year as well as summer internship opportunities. EPSCoR also supports research of faculty mentors which, in turn, aids in the support of LSAMP Scholars involved in those projects. Some details on the strengths and partnerships of LSAMP on each campus are as follows.



Bluegrass Community and Technical College (BCTC) is a multi-campus institution that expands the commonwealth of Kentucky. The LSAMP program coordinator at BCTC is highly involved with many programs, including extensive activities focused on diversity recruitment and college readiness programs for high school students. College Experience Camp is a week-long intensive college preparation program that allows high school students to learn and experience college processes such as application, enrollment, registration, orientation, testing, advising, and classes. CARNEGIE HALL was developed to broaden participation in STEM disciplines from high school students of LSAMP targeted populations. This program seeks to increase students' STEM knowledge prior to entering college, thereby leading to the production of more STEM undergraduates and further exploration and selection of STEM careers. BCTC is instrumental in aiding in the transfer rates of students from 2-year to 4-year institutions. Many of the LSAMP Scholars successfully transfer and continue to participate in LSAMP activities. Current KSU student, Trevor Claiborn, is an excellent example.



Centre College is a small private institution with about 1400 students and has been recognized as a top 50 liberal arts college. They have a commitment to research and study abroad experiences. About 85% of the students have at least one study abroad experience before graduation. In 2015, Centre welcomed its 10th class of Posse Scholars. The Posse Foundation is designed to offer college access to students from underrepresented populations in urban locations. Each year, recruits from the organization (in groups of 10) are provided four-year, full tuition scholarships to attend one of the partner institutions. This partnership greatly contributes to the numbers of students from underrepresented populations who are enrolled at Centre. In 2014-2015, Centre had ten URM students enrolled in STEM majors. Of these ten students, seven were supported by the LSAMP program. Several of these Scholars have gone beyond their research experiences on campus and have presented their research at state and national conferences.



Kentucky State University (KSU) is the only Historically Black College and University (HBCU) in the commonwealth of Kentucky. It is committed to increasing undergraduate enrollment leading to BS degrees in STEM disciplines. The presence of the LSAMP program has had a positive impact on this commitment. KSU's primary LSAMP activity is Peer Led Team Learning (PLTL). PLTL consists of weekly gatherings at which Scholars from the LSAMP and EPSCoR programs participate in team learning activities. PLTL is designed to assist all participants with mentoring and tutoring, assisted by faculty. Participants are paired with peer leaders to ensure success. All participants are expected to take full advantage of opportunities and help each other to succeed with completing their respective BS degrees. There are also opportunities for Scholars at KSU to conduct summer research at the UK main campus as well as the UK Center for Applied Energy Research.



Marshall University utilizes a Therapeutic Intrusive Advising Model designed to encourage and foster LSAMP students in a nurturing and caring environment, ensuring that all unmet academic, intellectual, physical, and emotional needs are being addressed. Each LSAMP Scholar is assigned to a graduate student who serves as an advisor and mentor; this graduate student facilitates the LSAMP Scholar's utilization of campus resources such as tutoring services, counseling services, disabled student services, writing center, Higher Education for Learning Problems Center (H.E.L.P.), the speech and hearing center, and career service resources to assist them after graduation in their search for employment. The Marshall University LSAMP program has built strong relationships with its individual STEM related colleges, deans, department chairs, and faculty who provide additional research opportunities for LSAMP Scholars within their respective colleges. These research opportunities result in LSAMP Scholar posters presented at Marshall's research day. The Marshall LSAMP program is housed in the Division for Intercultural Affairs, enabling collaboration with the Chancellor's Scholars Program, the Center for African American Students, and the Society of Black Scholars.



The University of Kentucky (UK) serves as the lead institution and houses the KY-WV LSAMP main office. At UK, the LSAMP program has developed a partnership with the Broadening Participation in Engineering (BPE) Program. Dr. Eduardo Santillan-Jimenez, Director, is a research scientist at the UK Center for Applied Energy Research. With the partnership, both programs will share resources (such as speaker contacts and professional development workshops) and best practices in recruiting, mentoring, retaining, and preparing Scholars for STEM professions. In addition, there are a number of programs (such as Student Support Services – a Department of Education grant and STEMcats - a Howard Hughes Medical Institute grant) and several resource offices (such as the Center for Academic Resources and Enrichment Services-CARES, and the Office of Undergraduate Research) with which the LSAMP program works closely and uses as an advising group. CARES provides a summer bridge program for incoming freshmen and transfer students and a series of academic year professional development workshops with topics such as time management, stress management, and study skills. The Office of Undergraduate Research provides training on presentation skills, oversees the UK Bucks for Brains, has resources for printing posters, hosts the UK Undergraduate Showcase (research presentations) and provides some funding for conference travel.

Bucks for Brains is an investment and incentive program created by the Kentucky Postsecondary Education Improvement Act of 1997. Six funds were created including: Research Challenge, Regional University Excellence, Technology Initiative, Physical Facilities, Postsecondary Workforce Development, and Student Financial Aid and Investment. *Kentucky's Bucks for Brains Initiative: The Vision, The Investment, The Future 1997-2007* can be found in Appendix C.



The University of Louisville (U of L) has developed a unique system of grouping student support programs and undergraduate research initiatives so that all are able to share resources and leverage funds appropriately. A few examples of programs and initiatives with which LSAMP has partnered include, but are not limited to: a university-wide Undergraduate Research Symposium, the Commission on Diversity and Racial Equality (CODRE) program of the Office of the Vice President for Research, summer bridge programs for high school students, and several summer research programs including REU's and **Bucks for Brains**.



West Virginia State University (WVSU) was founded in 1891 as an Historically Black College but has evolved to serve a diverse population. At WVSU, LSAMP is housed in the Center for the Advancement of Science, Technology, Engineering, and Mathematics (CASTEM). CASTEM's mission is to encourage West Virginia's Youth to pursue careers in STEM fields and inspire them to become future engineers, scientists, researchers, teachers, and leaders. CASTEM also houses the NASA Science, Engineering, Mathematics, and Aerospace Academy (NASA SEMAA) and Research Rookies. NASA SEMAA was created to increase recruitment and retention of K-12 students into STEM fields through inspiration, engagement, and education activities. This program has activities for parents and family as well as the student participants. Research Rookies is a program for undergraduates to participate in yearlong research projects. Through these programs,

LSAMP has access to a wide recruitment pool. The CASTEM director serves as the LSAMP Campus Coordinator at WVSU.



West Virginia University (WVU) has a well-established alternative series of classes for calculus. The Emerging Scholars Program (ESP) focuses on student collaborative learning. After minimal time spent in a lecture format, the class participants move to an environment in which groups of students work on problems, compare, and present answers. This collaboration among students stimulates additional interactions and more thinking about course content. Workshop problems are based on the material covered in lecture but designed to challenge each student's ability. This active learning approach produces a thorough understanding of the concepts and an unusual level of creativity. ESP students, more often than not, perform better in their subsequent courses, gain a better understanding of calculus, and form personal, long lasting friendships with other participants. This program began with ESP Calculus I and has now expanded to ESP Calculus II, III, and even IV.



Western Kentucky University (WKU) has developed research experiences for participants. Participants have presented their research at national conferences and continue their education in graduate programs. WKU has a unique recruitment opportunity due to having a charter high school located on the university campus. The Carol Martin Gatton Academy of Mathematics and Science in Kentucky is a residential program for high school students interested in pursuing STEM careers. Students are provided opportunities not found at many other high schools such as research opportunities and the chance to earn 60-72 credit hours toward a college degree while completing high school requirements. The Gatton Academy has been on the Washington Post list of Top Performing Schools for eight consecutive years.

Course Corrections

Operations Manual

An operations manual (Campus Coordinator Handbook) is being created. This document will help to provide guidance to new campus program staff and to create unity and consistency in program communications and data collection and maintenance. The manual will include information such as suggested program activities, requirements for student program participation, instructions and formats for providing participant data, and much more. Upon completion, the document will be provided to each campus in electronic and print formats.

Data Collection, Management, and Reporting

The new program director created a database of Scholars to track demographics, program participation, and accomplishments. The database is updated periodically and can be easily edited to store additional information as needed for project evaluation, reports, and dissemination. Templates have been created for quarterly reporting, so information gathered and collected can be more easily documented and be more consistent throughout the alliance.

Quarterly reports are required from each institution. Using a template, coordinators must report on participants (including demographics and academic progress), program activities, and Scholar highlights (such as presentations, publications, honors, and awards). Reports are required to be submitted before invoices will be processed for payment.

External Evaluation

Dr. Willie Pearson was contracted to provide an evaluation of the KY-WV LSAMP program. With Dr. Ed Marshall assisting him, Dr. Pearson visited three of the nine alliance campuses. During those visits, the evaluators conducted faculty and Scholar focus groups and interviews. An electronic survey was created and emailed to each active KY-WV LSAMP Scholar. Using these data and additional information received at alliance meetings and from the project director, an evaluation was created. A copy of the complete evaluation is in Appendix D. A few highlights include:

Of the nine 2014-2015 recommendations, five are completed. One (improving cyber sharing and the program website) has been improved, but is a continuous process. A new organizational chart and a campus coordinator handbook are being created, and conversations are being held regarding opportunities to present findings and lessons learned at major conferences and in peer-reviewed journals. All three topics are included on the agenda for an alliance retreat scheduled for August 2016.

During the course of the site visits to three of the KY-WV LSAMP campuses, Institution A does well at tracking Scholar participation and placing juniors and seniors in research experiences on campus. Institution B has had significant turnover in program staff and a change in demographics at the institution. These have attributed to a decrease in program participants. Participants and mentors at Institution C attribute many program successes to the dedication of the campus coordinator. There is also a high level of administrative support at this campus.

There was positive feedback from the electronic survey. However, though the survey was sent to each active Scholar, the response rate was extremely low (29 percent). Therefore, the conclusions drawn from the survey should be utilized for improvement but not taken as a consensus of the project as a whole.

There have been many improvements in the program in the last year. However, there are always areas that need attention, and the KY-WV LSAMP still has many issues to undertake. In addition to continuing to address the recommendations made in 2015, the new recommendations are to:

1. Investigate reports of a lack of institutional support for some campuses.
2. Engage in a joint process to review and implement required goals and objectives that encourage operation as an alliance including digital communities and sharing resources and best practices.
3. Provide formal orientations for all research mentors, administrators, and students.
4. Enhance summer research opportunities for students external to their respective campuses.
5. Document the extent of increasing Hispanic participation.
6. Properly track all LSAMP participants.
7. Insure that program activities and services reflect the needs of the participant demographics (specifically majors/discipline areas).
8. Director should hold a brief orientation regarding the nature and structure of evaluations with sites selected for next year's case studies and the criticality of participating in focus groups and interviews.
9. Director should work with campus coordinators to develop a relational database that has an authenticated list of documented LSAMP participants.

Program Staff Roles

Project Director

The interim project director, Dr. JJ Jackson, left the university in spring 2015. A new project director began October 1, 2015. Fara Williams came from Oklahoma where she worked for eight and a half years on the Oklahoma LSAMP program. In her first months as project director, she visited each of the alliance campuses for face-to-face meetings with program staff as well as mentors and Scholars when available. Ms. Williams used her observations and years of LSAMP experience to provide suggestions for improvement and expansion of program activities as well as praise for best practices.

Ms. Williams has established communications to receive enrollment and degree data from the Kentucky Council on Postsecondary Education (KY CPE) and the West Virginia Higher Education Policy Commission (WV HEPC). This will ensure more accuracy and consistency in enrollment and degree numbers beginning with the 2014-15 academic year.

Other accomplishments include: 1) a database for tracking participant information and activities, 2) a streamlined plan for making participant data collection consistent and easier for campus coordinators as well as administration staff, 3) language and ideas for improving the program website, 4) programmatic and documentation ideas for increasing the quality and quantity of program activities and participants on each campus, and 5) planning of an alliance retreat for all

coordinators and lead program staff. There is a renewed energy in the alliance and a renewed sense of purpose to lead the program into the 2016-17 academic year.

Financial Officer

Mark Pittman has been designated as the project financial officer at the University of Kentucky. Mr. Pittman (with help and oversight of the Office of Sponsored Projects) 1) creates the subcontracts for the alliance institutions, 2) processes payment of invoices from the alliance institutions, 3) tracks all expenditures, and 4) provides monthly reports to the PI and project director.

External Partnerships and Funding

CVS Pharmacy provided an internship to a Centre College Scholar. Her housing and a stipend were paid by the college.

Kentucky EPSCoR sponsored one Scholar from Centre College summer 2015. One of the scholars at UK was also partially funded by Kentucky EPSCoR.

NASA Kentucky EPSCoR provided \$1,000 incentive research scholarships to selected KY-WV LSAMP Scholars. In 2015, three Scholars (one from KSU and two from UK) were awarded this funding.

Links to Existing Campus Programs

Bluegrass Community and Technical College

BCTC/KSU BLINKS Transfer Enterprise is a transfer collaboration. B is for BCTC, K is for KSU, and LINK is for The Links, Incorporated. The Links, Inc. *is one of the oldest and largest volunteer service organizations of women who are committed to enriching, sustaining, and ensuring the culture and economic survival of African Americans and other persons of African ancestry.* Students who are selected for the BLINKS Program receive *an opportunity to utilize mentoring, study strategies, and other resources to help them be successful at BCTC and to graduate with an Associate of Arts or an Associate of Science degree. After which, if they have a 2.8 GPA or above, they are awarded full tuition to KSU for their undergraduate study.* The purpose of the program is to: *increase the graduation rate of community college students, increase the number of community college students who transfer to HBCUs, encourage greater collaboration among community colleges and HBCUs, increase the enrollment of selected HBCUs, and increase the graduation rate of students at HBCUs.* <http://www.linksinc.org/>
http://bluegrass.kctcs.edu/en/Multiculturalism_and_Inclusion/Blinks.aspx

Carnegie Hall is a *one week intense summer immersion camp continuing throughout the year with semi-monthly Saturday learning activities*. The mission of Carnegie Hall is: *sparkling an age of a generation who conquers all challenges, while remaining committed to success. Constructing mathematical and engineering thought processes so that the sciences and technological aspect lead to more success. Making others stronger, by forfeiting....NOTHING!*

This year, Carnegie Hall celebrated its 10th year and held a reunion banquet with student reflections. [http://bluegrass.kctcs.edu/Multiculturalism and Inclusion/Carnegie Hall.aspx](http://bluegrass.kctcs.edu/Multiculturalism_and_Inclusion/Carnegie_Hall.aspx)

Latino Leadership and College Experience Camp (LLCEC) *is a unique experience that provides Latino and immigrant youth with an intensive college preparation and leadership development experience. Simulating college processes, high school students from across the state of Kentucky are able to enjoy a creative mix of college-like courses, leadership development workshops, team-building activities and social justice awareness. The LLCEC introduces participants to current college students, college professors, community leaders, and an extensive peer network. The close work with professors allows students to forge healthy and challenging professor/student mentorships that focus on academic success and personal accomplishment.* [http://bluegrass.kctcs.edu/en/Multiculturalism and Inclusion/Latino Hispanic Outreach/Camp.aspx](http://bluegrass.kctcs.edu/en/Multiculturalism_and_Inclusion/Latino_Hispanic_Outreach/Camp.aspx)

University of Kentucky

Bucks for Brains provided faculty stipends to two mentors with whom Scholars conducted research during Summer 2016. The Scholar stipends were provided by KY-WV LSAMP.

Center for Applied Energy Research (CAER) serves as a center to answer today's energy questions. *Among the most important aims is to assure that the benefits of investigations, research and study are applied, made available to the public and brought into the widest possible use. The Center, through its technology innovation and service to the community, contributes to improving the lives of Kentuckians by creating jobs and economic opportunities; by sustaining vital industries and public services; and by improving energy efficiency and protecting the environment.* <http://www.caer.uky.edu/energy/energy-research.shtml>

The College of Engineering Dean's Lecture Series at UK brought Dr. Cato Laurencin to campus. Dr. Laurencin holds both MD and Ph.D. degrees and is an expert in tissue regeneration. As part of his visit to UK, Dr. Laurencin spent time visiting with several LSAMP Scholars and other select students about research, mentoring, and being successful in academia as well as industry.

Engineering Broadening Participation Program is funded by the National Science Foundation and focuses on mentoring students from underrepresented populations at both the undergraduate and graduate level. Housed at the CAER, the program has three goals: *1) to motivate African American, Hispanic, and Native American students to choose engineering and help them graduate with engineering degrees, 2) to help these students acquire the skills they need to become*

engineering professionals, academics, leaders, and role models, and 3) to investigate if mentoring in research centers offers advantages over mentoring in traditional engineering departments.

<http://enr-mentoring.caer.uky.edu/about.html>

Office of Undergraduate Research's mission is to promote high quality, undergraduate student-faculty collaborative research and scholarship in all disciplines across campus, and to use all available resources to support and advance the research endeavor. This office provides extensive matching assistance as well as support for academic year research, summer research, and presentation opportunities including the annual UK Showcase of Undergraduate Research and the National Conference on Undergraduate Research (NCUR).

<http://www.uky.edu/academy/UGResearch>

STEMCats, is a Howard Hughes Medical Institute (HHMI) funded initiative. STEMCats is a pre-Fall freshmen academic, research and professional-development residential program. This living learning program is intended for first year students who have applied for a STEM major or who are interested in a STEM major plus a small cohort of transfer students from the Bluegrass Community and Technical College. STEMCats is supported by the College of Arts and Sciences, Pharmaceutical Sciences, Physiology, Molecular & Biomedical Pharmacology, and the Division of Natural Sciences at Bluegrass Community and Technical College. STEMCats will make for a smoother transition for first year and transfer students coming to UK.

<https://stemcats.as.uky.edu/stemcats-about-us>

Programs on Multiple Campuses

On each campus, the LSAMP program has a close working relationship with the **Diversity Offices**. The level of support and partnership varies among institutions, but types of support have included, but is not limited to: direct financial support for LSAMP Scholars, support for recruitment and retention initiatives, partnerships with programs housed under the diversity office, and (in some cases) the LSAMP program is directly housed under the Diversity Office.

Student Support Services (SSS) Program is a TRiO program funded by the Department of Education. This program exists on many of the alliance campuses and serves as a partner for recruitment and services to LSAMP Scholars. Funds are awarded to institutions of higher education to provide opportunities for academic development, assist students with basic college requirements, and to motivate students toward the successful completion of their postsecondary education. SSS projects also may provide grant aid to current SSS participants who are receiving Federal Pell Grants. The goal of SSS is to increase the college retention and graduation rates of its participants. <http://www2.ed.gov/programs/triostudsupp/index.html>

Upward Bound and Talent Search are TRiO programs funded by the Department of Education. These programs are intended for middle school and high school students to prepare them for entrance into and success in college. One or both programs exist on many alliance campuses and

serve as a resource for recruiting students to college and the LSAMP program. In addition, there are occasions when LSAMP Scholars serve as volunteers, speakers, and/or summer staff for these programs.

New Activities

Cyber-Sharing

KY-WV LSAMP strives to increase communications and dissemination of program accomplishments and best practices. The program website has been extensively updated and continues to evolve to include more information and resources for Scholars, program staff, mentors and faculty across the nation. New features include, but are not limited to: contact information for program staff, important resource links for Scholars and other students, and Scholar profiles. <http://www.uky.edu/KYWV-LSAMP/index.html>

A Facebook group has been established to aid in conversations regarding accomplishments and opportunities. Information and questions may be posted by anyone who is a member of the Facebook group. Scholars are encouraged to post questions to each other and to other members of the group including faculty mentors and graduate students. The possibilities are endless. <https://www.facebook.com/groups/750676201700146/>

Evaluation Plan

Each year, the evaluation team will visit three of the nine institutions in order to perform focus groups and interviews with Scholars, faculty mentors, program staff, and campus administration. An electronic survey will be distributed to all Scholars throughout the alliance. Interviews will also be held with the Project Director and other program staff at the lead institution. Using data collected through these methods as well as data provided by the Project Director, the evaluation team will create an analysis of the success of the LSAMP program as an alliance. They will offer recommendations to improve the program as a whole as well as give quality feedback to the site visit campuses.

Dissemination

KY-WV LSAMP continues to update the program website. Resources for Scholars, faculty mentors, and program staff will continue to be added and updated. In addition, there are plans for Co-PI's, campus coordinators, and/or the project director to submit abstracts to conferences and begin working on articles for peer-reviewed journals. At the alliance retreat, there will be discussions on topics to be presented, venues for presenting, and journal choices for article

submission. A list of possibilities will be drafted and prioritized with a timeline and a selected lead presenter/writer for each opportunity.

FACULTY HIGHLIGHTS

Charlene Walker, BCTC Vice President for Multiculturalism and Inclusion and KY-WV LSAMP Campus Coordinator, served on a panel presentation on “The Community College – Historically Black Colleges and Universities (HBCU) Model – A Pathway to Quality-Cost Effective College Education and Graduation” at the Association of Community College Trustees (ACCT) 2015 Leadership Congress in San Diego, California.

Charlene Walker also received the Urban League of Lexington Individual Champion of Diversity award.

This award was given at the league’s Annual Empowerment Banquet on Monday, October 19, 2015. The Urban League’s annual diversity awards are presented to recognize an individual and a business that embrace, celebrate and apply holistic inclusion and participation of a diverse people.

Walker has spent her career creating and directing activities that give students their best opportunity to be successful. At BCTC, she has supported Latino Outreach, International Students and Scholars Services, Diversity Outreach, Intramural Sports, Ready-to-Work, and BLINKS, a program for students transferring to Kentucky State University. She has administered grants with operating budgets of over \$2.3 million. She is sought after as a speaker at state and national conferences on issues related to sexism, racism, and classism, and is a member of numerous civic and community organizations including Kentucky Organ Donors Association, the Planning Committee for the annual Lexington Martin Luther King, Jr. March and Celebration, and the University of Kentucky Appalachian Center.

Dr. Augusta Julian, president of BCTC, nominated Walker in recognition of her impact on students’ lives. “Charlene is one of the most committed student advocates I have ever worked with. Her commitment to inclusion and student success drives her work and has resulted in hundreds of students who are working in their dream careers today. Her creation of an annual diversity conference has also given students and partner institutions support to reach their goals. We are very proud of her.” <https://youtu.be/hnNPkijXPaY>

News of this award can be found in Appendix E.

SCHOLAR and ALUMNI HIGHLIGHTS

National Conference on Undergraduate Research (NCUR)

KY-WV LSAMP was well represented at the 30th National Conference on Undergraduate Research (NCUR). The April 2016 event was held at the University of North Carolina, Asheville. Scholars presented posters and gave oral presentations on their research projects. In addition, they attended other student presentations, visited with graduate school and industry representatives, made connections with faculty, and explored the Asheville area through excursions offered by the conference. Photos of the 30th NCUR can be found in Appendix F.

Eight Scholars were selected to present at the 2016 NCUR. Those Scholars were: **Danielle Chavis**, WKU, *Small Molecular Donor-Accepted Dyads as Additives in Organic Photovoltaics*; **Trevor Claiborn**, KSU (BCTC transfer), *Farmer Brown Tha' MC and Tha' Green Team*; **Nathan Crowdus**, WKU, *Elevation and Mesoscale Temperature Variations*; **Logan Douglas**, UK, *The Relationship of Probiotics on the Intestinal Microbiota of Children with ASD*; **Sabita Dumre**, UK, *Screening of a Peptide Library for a Neuroprotective Binding Target*; **Charlie Nelson**, KSU, *Validation of the Antarctic Snow Accumulation and Ice Discharge Basal Stress Boundary of the Southeastern Region of the Ross Ice Shelf, Antarctica*; **Ashley Pittman**, UK, *Use of Intraosseous Needles for Infusion of Contrast Media for Computed Tomographic Angiography*; and **Taylor Walker-Smith**, Centre, *Snuggle Power: Opioid Mediated Contact Comfort Reinforces Incubation Behavior in Birds*.

Posters/Research at the Capitol

Six Scholars were selected to represent their institution and presented at **Kentucky's Posters at the Capitol**. They were: **Boniface Amankona**, KSU, *Methane Flux Measurements over a Rotational Grazed Pature in Northern Kentucky*; **Sabita Dumre**, UK, *Screening of a Peptide Library for a Neuroprotective Binding Target*; **Maya McFrazier**, U of L, *Nucleoside diphosphate Kinase-Dependent Suppression of Apoptosis in Esophageal Cancer Cells by the Oral Pathogen *Porphyromonas Gingivalis**; **Courtney McKelphin**, UK, *Optimization of Microalgae Lipid Extracts for the Production of Fuels*; **Thomas Packer**, U of L, *Impact of Quercetin on miR-21, Cell Proliferation and Migration of Metastatic and Non-Metastatic Prostate Cancer Cell Lines*; and **Karen Udoh**, U of L, *Inhibiting the Anaphase-Promoting Complex/Cyclosome: an Innovative Approach for Cancer Chemotherapy*.

Four Scholars were selected to represent WVU and presented at **West Virginia's Research Day at the Capitol**. They were: **Evelin Flamenco**, *Leaf Angle Phenology of Twelve Central Appalachian Tree Species: Implications for Carbon and Energy Fluxes*; **Kristen Mastrantoni**, *Characterization of a Novel Zinc Finger Protein Using Molecular Techniques*; **Ryan North**, *The Effect of Height and Gender on the Range of Arm Motion*; and **Matthew Parsley**, *Statewide Dissemination of a Culinary Skills, Family Mealtime and Physical Activity Program through HSTA*.

Photos and abstracts from Kentucky Posters at the Capitol and West Virginia Research Day at the Capitol can be found in Appendix G and Appendix H, respectively.

Individual Accomplishments

Many Scholars made accomplishments and received honors throughout the 2015-2016 academic year. Snapshots and news releases of select accomplishments can be found in Appendix I. Below are some examples of KY-WV LSAMP Scholar accomplishments.

Boniface Osei Amankona, former BCTC Scholar and current KSU chemistry senior, presented “Mechanical Properties of Polymer Binders in Lithium-ion Batteries” at the Kentucky Academy of Science Annual Meeting in November 2015 and the KY-WV LSAMP Annual Research Symposium on April 2, 2016. He presented “Methane Flux Measurements over a Rotational Grazed Pasture in Northern Kentucky” at Posters at the Capitol on February 25, 2016. Boniface also presented at the KSU Liberal Arts Symposium and completed his BS degree in May 2016.

I. Khalil Appleton, UK electrical engineering sophomore, participated in a summer research project at Louisiana State University in 2015. During the academic year, he conducted research with Dr. Johné Parker, LSAMP Co-PI. He presented his research at the LSAMP 25th Anniversary Research Symposium in Washington, D. C., February 22, 2016; the KY-WV LSAMP Annual Research Symposium; and at the UK Showcase of Undergraduate Research, April 27, 2016.

Kaylind Batey, Centre biology junior, conducted research that included a project to create a student friendly protocol for inquiry based labs in biochemistry and microbiology courses. Kaylind presented at Centre’s Research-Internship Creative Endeavors (RICE) Symposium, April 14, 2016, and received first place for his presentation at the Kentucky Academy of Science 2015 Annual Meeting in November. Kaylind was accepted for the MD/PhD REU at the University of Rochester, Summer 2016.

Grayce Behnke, Marshall forensic chemistry junior, will conduct research on “Modifying the Surface of Zinc Oxide Nanoparticles” at Marshall University Summer 2016.

Alemayeh Bekele, WVSU computer science senior, completed requirements for the BS degree.

Torli Bush, WVU engineering junior, presented “Star Centroiding for On-orbit Calibration of the Optical Navigation Camera for NASA’s Orion Vehicle” at the KY-WV LSAMP Annual Research Symposium on April 2, 2016.

Danielle Chavis, WKU physics junior, presented her research at the KY-WV LSAMP Annual Research Symposium on April 2, 2016, and at the National Conference on Undergraduate Research in Asheville, North Carolina, April 7-9, 2016.

Trevor Claiborn, former Scholar from BCTC and current KSU agriculture systems senior, has created educational videos to interest elementary students in agriculture. These videos are posted on YouTube and have been used to conduct surveys on K-12 student experiences with agriculture. “Farmer Brown Tha’ MC and Tha’ Green Team” was accepted to be presented at the NCUR in Asheville, North Carolina, April 2016. Trevor also presented at the KY-WV LSAMP Annual Research Symposium and received the 2016 MOSAIIC (Multicultural Opportunities, Strategies, and Institutional Inclusiveness Conference) award. This award is given to a BCTC faculty or staff member, a student, a community member, or an institution with a proven commitment to diversity.

Nathan Crowds, WKU physics senior, presented “Elevation and Mesoscale Temperature Variations” at the KY-WV LSAMP Annual Research Symposium on April 2, 2016, and at the 30th National Conference on Undergraduate Research, Asheville, North Carolina, April 7-9, 2016.

Logan Douglas, UK dietetics senior, presented at the KY-WV LSAMP Annual Research Symposium, April 2, 2016, and at the 30th National Conference on Undergraduate Research in Asheville, North Carolina, April 7-9, 2016.

Sabita Dumre, UK biology junior, presented at the Kentucky Posters at the Capitol, February 25, 2016, and at the National Conference on Undergraduate Research, April 7-9, 2016.

Evelin Flamenco, WVU environmental geosciences and geography junior, presented “Leaf Angle Phenology of Twelve Appalachian Tree Species: Implications for Carbon and Energy Fluxes” at the West Virginia Posters at the Capitol, February 25, 2016. She was also featured on her department’s website.

Lynnora Grant, WVU engineering junior, presented “Direct Writing of Functional Materials for Use in Flexible Optoelectronics” at the KY-WV LSAMP Annual Research Symposium.

Elliot Guerrra-Blackmer, WVU applied and environmental microbiology junior, presented “Coupling of Diverse Nuclophiles and Tert-Butylisocyanide” at the KY-WV LSAMP Annual Research Symposium, April 2, 2016.

Evander Harris, Centre physics senior, worked with Dr. Bruce Rodenborn on a fluid dynamics project funded by a KY EPSCoR grant. Part of the funding included collaboration with researchers at the University of Texas, Austin. Evander presented his research to two groups on campus. He graduated May 2016 and has been accepted to a science education MS program at the UK.

Keenan X. Kocan, WVU engineering senior, presented at the KY-WV LSAMP Annual Research Symposium, April 2, 2016.

Jordan Martinez, Marshall chemistry junior, will conduct research on “Synthesis of the [C5Py5]Cr(CO)3 Radical” at Marshall University Summer 2016.

Kristen Mastrantoni, WVU biology junior, presented “Characterization of a Novel Zinc Finger Protein Using Molecular Techniques” at the West Virginia Posters at the Capitol.

Maya McFrazier, U of L biology sophomore, presented “Nucleoside diphosphate Kinase-Dependent Suppression of Apoptosis in Esophageal Cancer Cells by the Oral Pathogen *Porphyromonas Gingivalis*” at Posters at the Capitol on February 25, 2016, and at the Atlantic Coast Conference Meeting of the Minds Conference, April 8-10, 2016.

Courtney McKelphin, UK chemical engineering junior, conducted research with Dr. Eduardo Santillan-Jimenez at the UK Center for Applied Energy Research. She received funding through Kentucky EPSCoR and was featured in a video spotlight. February 23, 2016, Courtney presented at the LSAMP 25th Anniversary Research Symposium, February 22-24, 2016. Courtney presented “Optimization of Microalgae Lipid Extracts for the Production of Fuels” at Posters at the Capitol on February 25, 2016. April 2, 2016, she presented “Kinetic Study of Catalytic Decarboxylation/Cecarboxylation of Triglycerides to Fuels” at the KY-WV LSAMP Annual Research Symposium. On April 7, Courtney served on a panel of students to discuss challenges and support for underrepresented STEM majors at UK.

JeCoiya Moore, Centre biology freshman, spent the summer before her freshmen year conducting research with Dr. Jessica Wooten studying the phylogenetic relationships within the Chattahoochee Slimy Salamander. She presented her research locally and submitted an abstract for the Kentucky Academy of Sciences November meeting.

Jonathan Murphy, KSU chemistry sophomore, presented “Dynamics of Strongly Confined Grafted Polymer Chains” at the Kentucky Academy of Science Annual Meeting in November 2015 and the LSAMP 25th Anniversary Research Symposium in February 2016. He also presented at the KSU Liberal Arts Symposium and the American Chemical Society National Conference.

Charlie Nelson, former BCTC Scholar and current KSU computer science senior, had his abstract for “Validation of the Antarctic Snow Accumulation and Ice Discharge Basal Stress Boundary of the Southeastern Region of the Ross Ice Shelf, Antarctica” accepted by the NCUR conference in Asheville, North Carolina. He completed his BS degree at KSU and will begin an MS program at the University of Louisville.

Ryan North, WVU engineering senior, presented “The Effect of Height and Gender on the Range of Arm Motion” at West Virginia Research Day at the Capitol, February 25, 2016. He presented “Analysis of Arm Motion for Implementation for Robotic Device” at the KY-WV LSAMP Annual Research Symposium, April 2, 2016.

Spencer Overstreet, Centre biology senior, was funded by LSAMP to conduct research with her mentor, Dr. Steve Asmus, summer 2015. In addition, she received an internship with CVS pharmacy. Spencer received her BS in May 2016 and plans to pursue an MS degree.

Thomas Packer, U of L biology senior, presented “Impact of Quercetin on miR-21, Cell Proliferation and Migration of Metastatic and Non-Metastatic Prostate Cancer Cell Lines” at Posters at the Capitol on February 25, 2016.

Matthew Parsley, WVU exercise physiology and biology senior, presented “Statewide Dissemination of a Culinary Skills, Family Mealtime and Physical Activity Program through HSTA” at West Virginia Research Day at the Capitol, February 25, 2016, and at the KY-WV LSAMP Annual Research Symposium, April 2, 2016. He was featured on his department’s website.

Ashley Pittman, UK medical laboratory science senior, presented “Use of Intraosseous Needles for Infusion of Contrast Media for Computed Tomographic Angiography” at the National Conference on Undergraduate Research in Ashville, North Carolina, April 7-9, 2016.

Ephraim Pittore, WVU mechanical engineering senior, presented “Design for Manufacturability and Product Optimization of Small Scale Wind Turbines” at the KY-WV LSAMP Annual Research Symposium, April 2, 2016.

Dr. Astrid Suarez followed her BS in Meteorology from WKU with an MS and Ph.D. from Penn State University. Dr. Suarez has accepted a civil service position as a meteorologist at the Air Force Technical Applications Center at Patrick Air Force Base near Melbourne, Florida.

Karen Udoh, U of L biology freshman, presented “Inhibiting the Anaphase-Promoting Complex/Cyclosome: An Innovative Approach for Cancer Chemotherapy” at Posters at the Capitol on February 25, 2016, and at the Atlantic Coast Conference Meeting of the Minds Conference, April 8-10, 2016.

Day Vance, Centre biology freshman, conducted research with Dr. Brian Cusato studying sympathetic and empathetic prosocial behavior in rats. She learned how to design and conduct an experiment, gather data, and report results. She presented at the summer research colloquium.

Taylor Walker-Smith, Centre chemistry sophomore, spent part of summer 2015 at the U of L conducting research in the Summer Medical and Dental Education Program and part at Centre conducting research with Dr. Melissa Burns-Cusato, professor of behavioral neuroscience. Taylor received second place for her presentation at the Kentucky Academy of Sciences 2015 Annual Meeting in November. She presented “Snuggle Power: Opioid Mediated Contact Comfort Reinforces Incubation Behavior in Birds” at the KY-WV LSAMP Annual Research Symposium. The abstract was also accepted to the National Conference on Undergraduate Research in Ashville, North Carolina. Summer 2016, she will be conducting research with Dr. Jessica Wooten in the Professional Education Preparation Program at UK.

Jordan Wells, KSU chemistry junior, presented a poster at the LSAMP 25th Anniversary Research Symposium in Washington, D. C., February 22-24, 2016, and at the KY-WV LSAMP Annual

Research Symposium, April 2, 2016. She also presented at the KSU Liberal Arts Symposium and the Kentucky Academy of Science Annual Technical Meeting in November 2015. Her research poster was titled, “Cellulose Acetate and Composite Membrane Synthesis.”

STAFF TRAINING AND DEVELOPMENT

KY-WV LSAMP support staff are an important aspect of the program. Project staff continue to seek professional development opportunities. Highlights, include, but are not limited to:

Elena Rodriguez has been hired to assist Charlene Walker with recruitment of LSAMP participants at Bluegrass Community and Technical College.

Fara Williams, project director, (1) received precision driver training for driving 12 passenger vans, (2) presented/volunteered for the Cherokee College Preparatory Institute (CCPI), college readiness program for Native American high school juniors and seniors, July 2015, (3) attended the Peach State LSAMP symposium, November 2015, (4) attended the Louis Stokes Midwest Center of Excellence (LSMCE) Conference, November 2015, (5) served as a student poster judge at the LSMCE Conference, (6) attended the 25th Anniversary LSAMP Research Symposium in Washington, D. C., February 22-24, 2016, (7) attended Kentucky Posters at the Capitol, Frankfort, Kentucky, February 25, 2016, (8) participated in a University of Kentucky focus group conducted to explore the university’s diversity and inclusion activities and issues (9) attended the National Conference on Undergraduate Research (NCUR) at the University of North Carolina, Asheville, North Carolina, April 7-9, 2016

APPENDIXES

APPENDIX A

2016 KY-WV LSAMP
PROGRAM BROCHURE

Program Contacts

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The Kentucky West Virginia Louis Stokes Alliance for Minority Participation (KY-WV LSAMP) program is a consortium of colleges and universities working together to create, enhance, and expand programs designed to broaden participation and increase the quality and quantity of students from underrepresented populations who receive degrees in science, technology, engineering, and mathematics (STEM) disciplines. Program goals and activities focus on undergraduate research experiences, graduate school preparation, and international experiences. The LSAMP program is named after the late Ohio Congressman Louis Stokes, who was responsible for numerous minority focused programs through the National Science Foundation and the National Institutes of Health (NIH).

KY-WV LSAMP

University of Kentucky
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Lexington, KY 40506-0027

The University of Kentucky does not discriminate on the basis of race, color, national origin, gender, information sex, age, sexual orientation, gender identity, religion, disability, or status as a veteran in any of its policies, practices and procedures.

Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation or the University of Kentucky.

Kentucky West Virginia
Louis Stokes Alliance for
Minority Participation in
Science, Technology, Engineering,
and Mathematics (STEM)

KY-WV LSAMP



Funded by the National Science Foundation
Grant #: JIRD 2305029



Benefits

- ◆ Financial awards
- ◆ Paid summer research internships
- ◆ Research projects in state-of-the-art laboratories with faculty mentors
- ◆ Peer mentoring
- ◆ Travel opportunities to present research at state and national conferences
- ◆ Opportunities to prepare for graduate school and the application process
- ◆ Opportunities for professional development and personal growth
- ◆ Opportunities to network with professors and professionals nationally
- ◆ Opportunities to collaborate on multi-lab research projects
- ◆ Opportunities to participate in international research



Qualifications

- ◆ US Citizen or permanent resident
- ◆ Maintain full-time enrollment in an approved STEM major
- ◆ Maintain a 3.0 GPA
- ◆ Demonstrated intent in pursuing research experiences and/or post graduate studies in a STEM field

Participation Commitments

- ◆ Participate in and contribute to program activities
- ◆ Attend scholar meetings
- ◆ Participate in research activities
- ◆ Participate in the KY-WV LSAMP Annual Research Symposium
- ◆ Participate in summer internships
- ◆ Provide and receive leadership and peer mentoring
- ◆ Prepare for the Graduate Record Exam (GRE)
- ◆ Complete the GRE
- ◆ Submit applications for graduate school



Qualifying Majors

SCIENCES
 Agronomy
 Animal Science
 Biochemistry & Molecular Biology
 Biology
 Botany
 Cell & Molecular Biology
 Chemistry
 Entomology and Plant Pathology
 Environmental Sciences
 Forestry
 Geology
 Horticulture
 Meteorology
 Molecular Genetics
 Nutritional Sciences
 Physics
 Zoology

TECHNOLOGY & ENGINEERING
 Biosystems Engineering
 Chemical Engineering
 Civil & Environmental Engineering
 Industrial Engineering
 Mechanical Engineering
 Aerospace Engineering
 All Engineering Technologies
 Fire Protection and Safety
 Architecture
 Engineering

MATHEMATICS & INFORMATION SYSTEMS
 Mathematics
 Management Information Systems
 Management Computer Sciences
 Statistics

**Above is a condensed list of approved majors. If your major is not listed, visit with program staff.*



APPENDIX B

KY-WV LSAMP
ANNUAL RESEARCH SYMPOSIUM
LEXINGTON, KENTUCKY
APRIL 2, 2016

KY-WV LSAMP Annual Research Symposium



Saturday, April 2, 2016
The Club at Spindletop Hall
University of Kentucky
Lexington, Kentucky



Program and Abstract Book Cover



KY-WV LSAMP

Annual Research Symposium

The Club at Spindletop Hall
Lexington, Kentucky
April 2, 2016



APPENDIX C

KENTUCKY'S BUCKS FOR
BRAINS INITIATIVE
THE VISION
THE INVESTMENT
THE FUTURE
1997-2007



KENTUCKY'S BUCKS FOR BRAINS INITIATIVE

THE VISION THE INVESTMENT THE FUTURE

1997 - 2007

At this 10th anniversary of postsecondary education reform, this brochure provides an overview of Kentucky's historic investment in an innovative endowment match program (Bucks for Brains) and a summary of its short-term outcomes.

**KENTUCKY COUNCIL ON
POSTSECONDARY EDUCATION**





THE VISION

The Kentucky Postsecondary Education Improvement Act of 1997 (HB 1) created the Strategic Investment and Incentive Funding Program (codified as KRS 164.7911) to provide strategic financial incentives to advance postsecondary education. Six distinct trust funds were created: Research Challenge, Regional University Excellence, Technology Initiative, Physical Facilities, Postsecondary Workforce Development, and Student Financial Aid and Advancement.

The Endowment Match program, also known as the "Bucks for Brains" initiative, was established through the 1998 biennial budget and was designed to attract top researchers to Kentucky.

"The Bucks for Brains program has demonstrated . . . that Kentucky's citizens think education is important as a personal investment. The program has demonstrated the importance of higher education research to the development of Kentucky's economy and to the creation of solutions for Kentucky's health and socioeconomic problems."

*- Paul Patton
Governor, Commonwealth of Kentucky
1995 - 2003*

UNIVERSITY OF KENTUCKY



Future Treatments for Spinal Cord Injury

The University of Kentucky's Spinal Cord and Brain Injury Research Center (SCoBIRC) is focused on effective treatments for the estimated 11,000 Americans who suffer spinal cord injuries each year and the 1.5 million who sustain traumatic brain injuries. Edward Hall, an endowed chair and director of SCoBIRC, is leading a team of scientists to test various drugs that might inhibit secondary injury to the brain or spinal cord. The team includes Jim Geddes, Patrick Sullivan, Kathryn Saatman, and Alexander Rabchevsky (SCoBIRC), Stephen Scheff (Sanders-Brown Center on Aging), and Joe Springer (physical medicine and rehabilitation). Hall was a pioneer in the discovery and development of the steroid drug methylprednisolone, the only approved drug that has been shown to be effective for the treatment of spinal cord injury. He is hopeful that the protective effects of the newer drugs being tested by his group will far surpass the benefits of methylprednisolone.



New Treatments for Nicotine and Methamphetamine Abuse

Dr. Linda Dwoskin, a professor of pharmaceutical sciences and U. S. Surgical-Pfizer Endowed Professor, is currently involved in two related projects - one focused on nicotine and the other on methamphetamine. She is teaming up with UK colleagues Peter Crooks, the George A. Digenis Professorship/Chair in Drug Design and Discovery in the College of Pharmacy, and Dr. Michael Bardo, department of psychology. The research team is trying to find small molecules that block receptors and transporter proteins responsible for the "reward" associated with nicotine and methamphetamine use. These molecules might serve as novel therapeutic agents to help those who are addicted to drugs. The nicotine study is partially supported by a \$6 million grant from The National Institutes of Health (NIH) and is the largest single award ever received by the UK College of Pharmacy.

UNIVERSITY OF LOUISVILLE



Research in Biomechanical Engineering

Gina Bertocci, Ph.D., is the Charles A. Grosscurth Biomechanics Chair in Bioengineering and director of the Injury Risk Assessment and Prevention Laboratory at UofL. She studies the biomechanics of injury and rehabilitation and focuses primarily on child abuse and wheelchair transportation safety. In the child abuse area, her research team uses engineering techniques and medical principles to delineate between abusive and accidental injuries. Bertocci's wheelchair transportation safety research utilizes computer simulation and testing to understand the level of injury risk that someone seated in a wheelchair might experience during a crash, allowing manufacturers to design safer wheelchairs.



Treating Cardiovascular Disease

Roberto Bolli, M.D., is the Jewish Hospital Heart and Lung Institute Distinguished Chair of Cardiology and the director of the division of cardiology and UofL's Institute for Molecular Cardiology. His research focuses on preventing the damage caused during heart attacks by studying ischemic preconditioning, the phenomenon in which heart muscle exposed to brief periods of stress becomes resistant to the tissue death that might be caused by a heart attack. Since his arrival at UofL in 1994, Dr. Bolli has brought over \$50 million in NIH grants to the university. Dr. Bolli is now working to determine whether gene therapy or other strategies that increase myocardial nitric oxide and carbon monoxide levels result in long-term protection against heart failure.

The Bucks for Brains (B4B) program requires that universities match the state funds with donations from philanthropists, corporations, foundations, and other non-profit agencies. Public and private matched funds are invested and the earnings fund faculty positions, programs, or scholarships. The invested principal remains untouched in order to provide a perpetual source of funding to ultimately meet the goals of HB 1 through the commercialization of research, the creation of knowledge economy jobs, and the improvement of Kentucky's economy and standard of living.

The University of Kentucky and the University of Louisville receive state B4B funds through the Research Challenge Trust Fund. B4B funding for the comprehensive universities is appropriated through the Regional University Excellence Fund.

"With focused investment of Bucks for Brains funding, the potential for groundbreaking translational research is maximized. The recently released cervical cancer drug is an excellent example of the potential impact . . . to improve the lives of Kentuckians."

- Ron Greenberg

*Executive Director, Cardiovascular Innovation Institute
Jewish Hospital and St. Mary's Healthcare
Former Chair, Council on Postsecondary Education*



THE INVESTMENT

From 1997 to 2007, the state of Kentucky invested over \$350 million to increase intellectual capital and infuse a new research agenda for Kentucky postsecondary education including:

- **\$110 million** from the General Fund in the 1998-00 biennial budget.
- **\$120 million** from the General Fund in the 2000-02 biennial budget.
- **\$120 million** from the sale of taxable bonds in the 2002-04 biennial budget.

When fully matched with private donations, this represents over **\$700 million** added to the endowments of Kentucky's public universities.

EASTERN KENTUCKY UNIVERSITY

Research & Enhanced Teaching

Dr. Jacqueline Jensen is the first Hazel Wilson Memorial Endowed Chair, made possible through a donation from 1934 EKU alumnus Vernon Wilson in memory of his wife of 50 years. The endowment enables Dr. Jensen to conduct research in middle school, high school, and college classrooms. Although her primary goal is to enhance teaching across the state, Dr. Jensen has studied and published articles about professionalism and professional ethics, the application of constructivist learning theories, and the recruitment of students into family and consumer sciences education. Dr. Jensen is a Fellow of the Kappa Omicron Nu Leadership Academy and is currently at work on a book that documents student reasoning of ethical dilemmas.



KENTUCKY STATE UNIVERSITY

Successful Fundraising Campaign

Kentucky State University has utilized Bucks for Brains funding to complete a highly successful fundraising campaign entitled "Kentucky's Vision 2020 Endowment Match Campaign." The campaign resulted in the creation of three endowed professorships in business, math/science, and education; an endowed library fund; and endowed student scholarships. The creation of the three endowed professorships has been complemented by the development of unique academic programs and the construction of a new genetics laboratory.



Private Gifts Leveraged Through Bucks for Brains Program

(as of June 30, 2006)

University of Kentucky	\$153,722,882
University of Louisville	82,731,805
Eastern Kentucky University	10,213,837
Kentucky State University	1,745,683
Morehead State University	6,645,655
Murray State University	8,380,683
Northern Kentucky University	8,033,753
Western Kentucky University	10,746,183
Total	\$282,220,481

THE RETURN ON INVESTMENT



As of 2006, Kentucky's public universities demonstrated the following returns on the B4B investment:

- 47 percent increase in annual giving at UK and UofL.
- \$1 billion increase in the market value of endowment assets at UK and UofL.
- 159 B4B endowed chairs and 227 endowed professorships appointed at Kentucky's public universities.
- 17 percent (approximately) of all federal R&D expenditures generated by B4B faculty.
- 14 percent (approximately) of all extramural R&D expenditures generated by B4B faculty.
- 16 percent (approximately) of all licenses/options generated by B4B faculty.
- 30 percent (approximately) of Kentucky's new U.S. patent applications generated by B4B faculty.
- 36 percent (approximately) of Kentucky start-up companies dependent on university-generated technology created by B4B faculty.

MOREHEAD STATE UNIVERSITY

Theater in the Schools Program

Dr. Robert Willenbrink, professor of theater and chair of the department of communication and theater, was selected as the W. Paul and Lucille Caudill Little Foundation Endowed Chair to oversee the development of a traveling performance troupe appropriately named The Little Company. The mission of the troupe is to annually produce plays and educational materials that tour the elementary, middle, and secondary schools throughout the region and the state. The Little Company promotes academic excellence and provides unique artistic opportunities for performers and audiences alike while exposing students, many for the first time, to the magic of live theater.



MURRAY STATE UNIVERSITY

Financial Planning Programs & Certification

The Arthur J. Bauernefeind Endowed Chair in Investment Management was the first endowed chair established at MSU as a result of Bucks for Brains and has resulted in the creation of a new program, the financial planning concentration, within the department of finance and economics. Dr. David Durr works to enhance regional recognition for the program through speaking engagements, seminars, and meetings. Recently he developed a student internship program in partnership with Security Benefit, a nationally recognized leader in financial services. This program provides undergraduate and graduate students with hands-on work experience relevant to their academic and career goals.



NORTHERN KENTUCKY UNIVERSITY

Strengthening Undergraduate Research

The Bucks for Brains program has played a pivotal role in elevating NKU's Center for Integrative Natural Science and Mathematics (CINSAM) to new heights. The mission of CINSAM is to enhance the teaching, learning, and applied science and mathematics at NKU and surrounding K-12 schools. Additionally, the new Dorothy Westerman Herrmann Science Center has secured B4B endowed funds to ensure that state-of-the-art lab and teaching equipment will remain current. The research activity of students in CINSAM-related departments has more than tripled over the past seven years. Students regularly present their research findings at local, state, and national meetings and several have published their findings in scholarly professional journals.



"The consequences and impact of the Bucks for Brains program have been far-reaching Economic development is advanced at the University of Louisville through enhanced pure research dollars, the multiplier effect of related research investment, and the commercialization of translational research. Most importantly, the quality of life for Kentuckians is improved when citizens are able to be treated locally for diseases such as Parkinson's."

*- James Ramsey
President, University of Louisville*

WESTERN KENTUCKY UNIVERSITY

Physics Research and Outreach

Dr. Charles McGruder serves as the William McCormack Professor in Physics, a named professorship created through the Regional University Excellence Trust Fund. Dr. McGruder receives a reduced teaching load so he may conduct research, travel in pursuit of his research, and participate in national academic and community service. He is involved in WKU's project to develop a worldwide network of robotically operated small telescopes. He also leads a National Aeronautics and Space Administration (NASA) grant to work with historically black colleges to encourage students of color to pursue doctoral degrees in the sciences, including consulting to organize an annual conference aimed at engaging minority students in science research.



"I recall spending an evening meeting some of the Bucks for Brains professors. It was an exhilarating experience to talk with such bright folks who were so happy to be in Kentucky and who thought that Kentucky had a great opportunity to make some real contributions through research. Several of the medical professors talked about their hope of finding cures for diabetes and cancer and other devastating illnesses that are so prevalent in Kentucky."

*- Joely Richards
Speaker of the House, Kentucky General Assembly*

Dr. Charles McGruder serves as the LSAMP Campus Coordinator at WKU.

THE FUTURE



Kentucky's investment in the Bucks for Brains program has successfully:

- Increased private donations to universities.
- Grown university endowments.
- Expanded endowed chairs and professorships.
- Enhanced intellectual capital at Kentucky's universities.
- Attracted significant increases in externally sponsored research.

For more information about the Bucks for Brains program, visit the Council's Web site at <http://cpe.ky.gov>.

"Sustain and strengthen the nation's traditional commitment to long-term basic research that has the potential to be transformational to maintain the flow of new ideas that fuel the economy, provide security, and enhance the quality of life."

*- Rising Above the Gathering Storm
The National Academy of Sciences,
2006, Pg. 4*





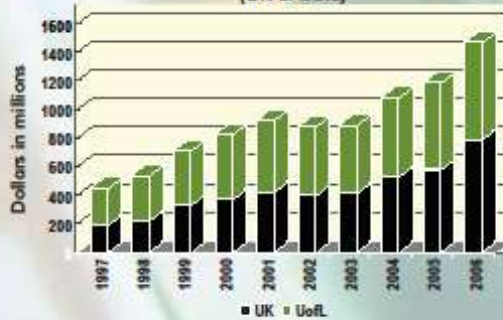
Bucks for Brains Program Indicators of Progress Combined UK and UofL Data*

(dollars in millions)

Indicator	1997	2000	2003	2004	2005	2006
Annual Giving	\$87.7	\$92.5	\$87.6	\$97.1	\$119.4	\$128.6
Endowment Market Value	\$447.4	\$823.9	\$887.5	\$1,081.4	\$1,184.4	\$1,465.4
Endowed Chairs	53	125	164	178	190	199
Endowed Professorships	49	136	201	211	218	256
Federal R&D Expenditures	\$75.6	\$91.6	\$159.9	\$184.4	\$209.9	\$221.7
Extramural R&D Expenditures	\$105.2	\$147.1	\$249.5	\$284.4	\$309.7	\$327.4
Invention Disclosures Received	70	94	92	141	142	157
New Patent Applications Filed	33	50	52	73	86	43
Licenses & Options Executed	6	16	17	15	21	31
Active Licenses & Options	59	67	77	86	116	142
Start-Up Companies Formed	0	6	2	6	7	11

*Based upon data available for the two research institutions submitted to the Association of University Technology Managers Annual Survey (AUTM)

Market Value of Endowment Assets (UK & UofL)

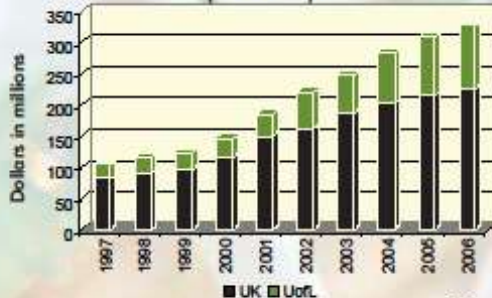


Endowed Chairs and Professorships (all universities)*

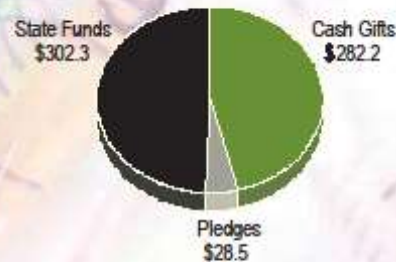


*Currently funded, but not all appointed

Extramural R&D Expenditures (UK & UofL)



Private Gifts Leveraged (all universities)



APPENDIX D

2016 KY-WV LSAMP
PROGRAM EVALUATION
SUBMITTED BY
DR. WILLIE PEARSON JR. &
DR. ED MARSHALL

External Formative Evaluation Report: 2015-2016

Kentucky\West Virginia LSAMP Alliance

Prepared by

Willie Pearson, Jr.

with assistance from

Edward Marshall, M.S.

Submitted to

Eli Capilouto, KY-WV LSAMP PI

June 4, 2016

Introduction

While there has been some progress, African Americans, Hispanics, Native Americans, Alaska Natives, and Pacific Islanders (underrepresented racial/ethnic minorities or URM) continue to be underrepresented at each level of science, technology, engineering and mathematics (STEM) education and the workforce (Pearson and Fechter, 1994; National Research Council, 2011; National Science Foundation, 2014). A number of federal and private foundation efforts have been implemented to increase the participation of URM in STEM disciplines and careers (BEST, 2004; National Research Council, 2005, 2011). There is strong evidence that a high-quality undergraduate research experience and mentoring play significant roles in recruiting and retaining URM in STEM disciplines and careers (Leggon and Pearson, 2010; Chemers et al., 2011; Ghee et. al 2014).

The National Science Foundation's Louis Stokes Alliance for Minority Participation (LSAMP) Program seeks to proactively encourage greater participation of URM in STEM disciplines, especially during the undergraduate years. In 2006, Phase 1 of the KY-WV Alliance (hereafter Alliance) began by establishing a relationship among 10 diverse academic institutions, two state EPSCoR programs and the undergraduate research and diversity programs at the partner institutions. During Phase 1, some success occurred in the areas of outreach and recruiting, peer mentoring, undergraduate research experiences, as well as summer bridge transitional programs for entering students, curricular reforms in "gatekeeper" courses and workshops on STEM research career options. Aspects of Phase 1 that proved particularly challenging included recruitment from Hispanic Communities, project management, faculty development to improve academic climate and the implementation of a

new cyber-enabled project component and the communication/sharing of information between campuses (Pearson, 2015).

Phase II attempts to capitalize on the successes and momentum of Phase 1, as well as remedy key challenges that were encountered. Nine of the original ten intuitional partners are participants in this phase. Targeted initiatives in Phase II are aimed at aggressively increasing the quality and quantity of students from URMs receiving baccalaureate degrees in STEM fields, as well as increasing the number of URMs attending graduate school or entering the STEM workforce upon receipt of a STEM degree (KY-WV LSAMP Proposal).

The primary purpose of this formative evaluation report is to assess the extent to which the KY-WV Alliance is accomplishing the goals and objectives outlined in its Phase II proposal, covering academic year 2015-2016. This report is organized in four sections: (1) *status of 2014-2015 evaluation recommendations*, (2) *methodology*, (3) *findings*, (4) *conclusions*, and (5) *recommendations*.

Status of 2015 Recommendations

The following recommendations relate to enhancing the efficiency and effectiveness of the KY-WV LSAMP Alliance:

1. Once clarification of baseline data occurs, it may prove necessary to request an opportunity to adjust the grant goals and objectives to be more realistic and attainable.

Status: *Clarification of baseline data associated with the Phase II submittal did not occur. Instead, the Alliance decided to utilize 2006-2007 data from Phase I of the grant to serve as baseline data for Phase II.*

2. A uniform definition of STEM and URM will need to be adopted by the partner

institutions. The LSAMP proposal solicitation and grant application clearly define the URM population to be served and the citizenship status of participants. The Alliance should adhere to the guidelines as well as those for Mid-level LSAMPS.

Status: *The Alliance has adopted uniformed definitions of STEM fields based on NSF codes. In addition, the Alliance will define their target populations as African-American, Native American, Hispanic or Pacific Islander.*

3. There is a need to establish a uniform reporting system, with a central institution being responsible for collecting and storing data/records in a way that such items are reasonably accessible by all partners.

Status: *A uniform quarterly reporting structure has been implemented by the Alliance's new project director. The requested data will be submitted to the project director and stored at the University of Kentucky. In addition, the new project director has established communications with state agencies (Kentucky Council on Postsecondary Education and West Virginia Higher Education Policy Commission) to receive enrolled and degree data for alliance institutions. This will allow for more consistency in the data.*

4. The incoming project director should secure the proper credentials to have immediate access to WebAMP, the online data reporting system for all LSAMP programs.

Status: *A project director has been hired and has secured access to the WebAMP system.*

5. The administrative structure and resource pool needs to be addressed directly with the PI (Eli Capilouto) or his designee. Of primary importance should be the securing of a full-time project director.

Status: *A full-time project director has been hired.*

6. Due to turnover, the Alliance organizational chart should be updated.

Status: *A new organizational chart is being developed and will be finalized at the 2016 KY-WV LSAMP Alliance planning retreat in August.*

7. Turnover among campus coordinators has been of issue, especially in terms of data accuracy, collection and reporting. It may prove beneficial to review the degree to which helping to administer the Alliance is a specific long-term responsibility of the coordinators, as opposed to a temporary and/or ill-defined responsibility.

Status: *The status of coordinators at the Alliance campuses has been reviewed, with a focus on the challenges associated with turnover rates and data reliability. At the 2016 KY-WV LSAMP Alliance Retreat in August, sessions have been planned for coordinators to review Alliance goals and objectives, share best practices and to insure compliance with procedural uniformity. In addition, a handbook is in the process of being developed for coordinators to help insure consistency in the administration of the Alliance across partner campuses, particularly in cases of coordinator turnover.*

8. In terms of the LSAMP dissemination plan, significant effort should be applied to the development of the “cyber sharing” component outlined in the proposal and enhancement of the resource portion of the website.

Status: *The KY-WV LSAMP Alliance website has been redesigned and is currently functional. A “resource” page has been integrated into the site and is being developed. Although not currently functional, a “cyber sharing” component is also under development to enhance the availability of resources in a cloud based environment.*

9. The Alliance is strongly encouraged to present findings or lessons learned to major conferences or peer-reviewed journals.

Status: *The project director has engaged partner campuses in discussions about*

presenting findings or lessons learned at major conferences and/or in peer-reviewed journals. However, while there has been a consensus to engage in such activities, there is uncertainty about which conferences and journals to target. As a result, the project director will seek external consultation to aid in accomplishing this goal.

Methodology

This formative evaluation plan calls for data collection using a mixed method approach-- quantitative and qualitative (Babbie, 2014; Berg and Lune, 2012; Booth, Colomb, and Williams, 2008; Frankfort-Nachmias and Leon-Guerrero, 2015; Neuman, 2011; Posava and Carey, 2007). *Quantitative* data collection is based on online or e-surveys distributed via participant emails which were provided by the eight partner institutions. Surveys were requested from 136 student participants at all partner institutions (inclusive of the case study sites), with 42 responding (31 percent response rate). Unless otherwise noted, all scaled items are on a 5-point (5=highest).

Qualitative data were gathered from individual and focus group interviews with LSAMP participants and three case studies. Last year, in conjunction with one of the University of Kentucky Co-PIs and the Interim Project Director, three partner institutions of varying Carnegie classifications, geographical location and student demographic student composition were selected for case studies. At the case study sites, data were collected via focus group interviews with student participants and faculty research mentors. Individual interviews were conducted with campus program administrators. A phone interview was conducted with the Alliance Project coordinator. A total of 10 administrative interviews were conducted (100 percent response rate). Focus groups were conducted with 16 student participants (88 percent response

rate) and eight faculty research mentors (100 percent response rate). Table 1 shows response rates by case study site.

Table 1 – Response rates by Stakeholder and Institution			
	Institution A	Institution B	Institution C
Student Surveys	28%	33%	100%
Student Focus Groups	15%	0%	100%
Faculty Research Mentors	0%	N/A	100%
Administrative Interviews	100%	100%	100%

All participants were informed of their rights as human subjects. All interviewees signed a form (or gave verbal consent) giving their consent for interviews to be audio taped. All tapes were transcribed verbatim without any identifiers by a professional transcriptionist. The transcripts were analyzed for critical themes by two experienced evaluators. In compliance with the confidentiality agreement, every effort has been made to avoid the identification of a particular respondent and partner institutions; therefore, some responses are presented in general terms. What follows is a discussion of findings of the case studies and general survey of Alliance student participants.

Findings

Case Studies

In order to qualitatively analyze the KY-WV LSAMP Alliance at the institutional level, case studies were conducted via site visits to three of the institutional partners. During site visits, interviews were conducted with LSAMP administrators and focus groups with students and research mentors. What follows are case study findings by institution.

Institution A

Two one- hour focus groups were conducted with a total of nine student participants during the site visit. Among the students, 78% were female, 78% African-American and 22% Hispanic. Two one-hour LSAMP administrator interviews were also conducted. One LSAMP administrator was designated by the Co-PI to serve as the partner's administrative lead. In addition to serving as the administrative lead for LSAMP, the aforementioned administrator oversaw all undergraduate research on the campus, including LSAMP assisted research placements. A second administrator holding a lower-level management position served as the LSAMP campus coordinator, and oversaw the day-to-day services delivered to participants. Program services were based on a peer-to-peer format, with a work-study student and LSAMP participant coordinating most of the activities. The coordinator explains the rationale for this format:

We've learned that students tend to be a little bit more open when it's someone more of a peer person than someone who they think to be more of an authority figure. So it's my role ... (to) oversee...(the) process ... (by) guiding and providing the support when __ (peer) needs it. [W]hen we run into case by case issues where there may be particular students who are having some issues...[I] ... meet with them one-on-one to... help them navigate whatever the issues are at the time.

It is unclear whether the work-study student has undergone formal ethics and confidentiality training in her role as a LSAMP employee. Additionally, the work-study student may not have the skills or status to assess participant needs or influence the mentors and peers to participate in the focus group interviews. No research mentors participated in focus groups.

Students

Table 2 provides student focus group responses to perceptions of whether or not particular goals and objectives are associated with the LSAMP program.

Table 2 –Students Perceived Existence of LSAMP Goals and Objectives		
	Yes	No
Improved Enrollment	100%	N/A
Improved Retention	100%	N/A
Enhanced Academic Performance and Achievement	89%	12.5%
Acquisition of knowledge and proficiency	89%	12.5%
Research Skills	100%	N/A
Successful application to graduate school in a STEM discipline	100%	N/A

Among focus group participants, 85% believed that gaining research skills was an important component of the LSAMP experience. However, engineering students were more enthusiastic about field experience, because they felt it to be more important in terms of career preparation.

Among student focus group participants, 77% reported attending study sessions sponsored by LSAMP; the primary reason for the 23% not attending was the lack of focus on major-specific courses. The following comments were made in reference to study groups:

...because this program isn't geared towards making sure that I succeed in my major (engineering). It's more of being part of a cohort that says I'm a minority in a STEM major.

Another student added:

It's more of the retention part of it. There are people around you who are other STEM majors. They are people you can relate to because they are going through the same thing...So there are benefits to the whole thing.

Students also expressed that other program activities had a strong focus on the life sciences and *pre-medicine*, but were not encompassing of majors such as engineering. One participant reflected on an engineering related career talk sponsored by the program by stating the following:

Bioengineering still kind of relates to the whole premed and bio kind of strain of sciences, where maybe in civil engineering, they don't deal with [life] science basically at all. Maybe LSAMP should do more engineering, not just the [life] sciences part of STEM.

Among the focus group participants, 77% believed that research experience was an important component of the LSAMP experience. Participants also engaged in mandated community service and professional development. Monetary stipends were provided to students based on their level of participation in required LSAMP activities. One participant reflected on the benefits of program participation with the following statement:

The stipend helps with tuition. A greater benefit is that the program provides an opportunity to build a more competitive resume, which in the long run, is going to be better than the money.

All focus group participants indicated that they were “*satisfied*” with the compensation received from LSAMP.

Research Mentors

Focus groups composed of research mentors were not conducted at the institution. Attempts were made to schedule the focus groups as requested, but faculty schedules at the point in the semester when the visit occurred proved to be saturated. The coordinator asserted that faculty would have needed significantly more advanced notice in order to insure their participation in the groups given their various academic obligations.

Administration

Unsurprisingly, both the administrative lead and coordinator indicated a firm understanding of the goals and objectives of LSAMP. In fact, the coordinator served as an intern with the program in graduate school and the campus Co-PI was integral in securing funding for Phase II of the KY-WV Alliance. The structure of LSAMP at the institution consisted of two key components: (1) the provision of student support and development during the academic year and (2) the coordination of summer research experiences.

Support services included study sessions, as well as the personal development and community service opportunities. These services are primarily based on a peer-to-peer model with an LSAMP participant organizing program activities on a day-to-day basis. The current program structure as it pertains to research, is focused on generating LSAMP assisted campus-based summer experiences for participants who are classified as rising juniors or seniors (46% of

the participants over the past 2 years). The aforementioned research participants are integrated into a larger campus effort, which includes research talks, career development and social activities.

LSAMP participants are primarily recruited via an existing program for high achieving students and from a list of minority STEM majors provided by the Office of Institutional Research. The list is analyzed by the LSAMP coordinator to identify eligible candidates. Several recruitment sessions are conducted during the academic year.

The coordinator indicated that non-LSAMP administration on the campus was very supportive of the program, particularly the president, who serves as a Co-PI, and chief administrator for diversity related initiatives. Overall, the LSAMP administration at Institution A believed that the Alliance needed to be enhanced in terms of the types of interactions that occur among the partner institutions. For example, one administrator felt that the Alliance administrators at the various campuses have become too dependent on the convenience of distance conferencing, which may diminish the quality of interactions required for partners to bond as an Alliance. The aforementioned administrator provided the following supportive statement:

...I really like face to face meetings. We do teleconferences and that sort of thing. It's wonderful to Skype, do teleconferences and I-Chat's, but I think meeting with people and just interacting with them is a little bit more [beneficial].

Summary

Participants at Institution A are tracked systematically using a robust institutional database, which can be queried to determine student involvement in a host of campus sponsored activities. However, it is unclear as to what degree the aforementioned activities are deliberately

targeted to fulfill LSAMP goals and objectives. Research placements coordinated by LSAMP are only provided in summers and are geared towards rising juniors and seniors. The aforementioned placements are integrated into a large campus-based institutional effort that is well structured and provides opportunities for academic, career and social enhancement. However, the administrator overseeing LSAMP participant research placements noted a lack of satisfaction in terms of finding suitable applicants among the eligible rising juniors and seniors (46% of the LSAMP participants served over the last 2 years). Given that research experience is a key programmatic objective, participant recruitment and research eligibility/selection guidelines may need to be reviewed. Program orientation for participants is well organized and delivered on a regular basis. As supported by students' comments, mandated activities, especially study groups, have been positive in terms of providing a sense of community among minority STEM majors; however, there was a concern among 33% of the students (all engineering) over the lack of support provided for STEM majors not associated with the life science. This brings to light the need to re-examine the nature of service delivery to participants, which is currently coordinated by an LSAMP work-study student and may need to involve more seasoned administrative oversight.

Institution B

Four one-hour LSAMP administrator interviews were conducted during this site visit. Two LSAMP administrators held executive level position at the institution, one serving as the Co-PI and the other (the former LSAMP campus coordinator) who is the Co-PI's designee for administrative oversight. A third LSAMP administrator, who oversees STEM research involvement of students on the campus as a whole, also serves as the LSAMP coordinator and reports to the Co-PI's designee noted above. The fourth LSAMP administrator coordinates an LSAMP feeder program, and serves as the Co-PI's executive assistant. One focus group was

also conducted with a research mentor and the technologist of another who supervised an LSAMP participant.

No students participated in focus groups.

Students

The LSAMP coordinator reported making several attempt to request students to participate in a focus group, although none committed to doing so. The evaluator was informed at least a week before arriving that there was a challenge getting students to commit to participation in the focus groups, with an understanding that all existing communication between the coordinator and students was via email or phone. The coordinator attributed the recent transition into his/her position as the potential cause of the low student focus group turnout, given the lack of time to establish influential relationships.

Research Mentors

A focus group was conducted comprised of one faculty research mentor and a lab tech who supervised one LSAMP participant. The two focus group participants admittedly had no basic or fundamental understanding of the LSAMP program, and could not distinguish LSAMP research mentees from others they have hosted. Although the aforementioned mentors were not familiar with LSAMP, they were familiar with the coordinator who assisted with the placement of some students into the lab. One research mentor interviewee assumed that all LSAMP students were attached to the Summer Undergraduate Research Experience Program, which was the primary mechanism for the placement of all students in their lab. One of the mentors noted that 86% of the students hosted in their lab over the years had a strong enough foundation to conduct research. However, it is unclear if the under-prepared students were associated with LSAMP. There was a significant language barrier between the evaluator and the research

mentors, which proved to be a challenge when probing for details. Due to the interviewees' lack of familiarity with the LSAMP program, it could not be ascertained whether or not LSAMP funding and support were adequate for the mentors to host students.

Administration

LSAMP is administered under an umbrella effort to enhance STEM research and outreach activities on campus. For a significant portion of Phase II, LSAMP has not been operational due to the absence of a designated program coordinator. The individual currently designated as coordinator has only been at the institution for a short time, and is not set to fully assume the role of LSAMP coordinator until the Fall 2016 semester. The previous coordinator received a promotion within the institution and attempted to continue coordinating LSAMP with limited success, as evidenced by the decline in program oversight and student participation. The former coordinator now supervises the new one, and is aiding in the transition to their full assumption of duties. One interviewee described the amount of current LSAMP funding as not aligned with the amount of time and resources required to successfully implement LSAMP goals and objectives.

One interviewee explained:

The largest challenge is the expectations associated with the grant. I don't consider that the [LSAMP] funding level is high enough to really be effective.

Though there was a concern over the adequacy of current resources, one interviewee argued that the success of prior LSAMP activities proved to be beneficial in terms of securing larger grants. Recruitment of the LSAMP participants has proven to be challenging due to the changing demographics at the institution, especially in term of the increase of non-traditional students.

One interview explained:

We have seen a dramatic increase in commuter students, students refreshing, and those trying to get a new degree. Now, the student pool is entirely different from that available in Phase I.

Given the overall status of the LSAMP during Phase II of the grant, there was insufficient information to assess perceptions related to current functionality of the campus LSAMP Program.

Summary

Due to administrative turnover, LSAMP has not operated on the campus for a significant portion of Phase II. Demographics changes at the institution have made the recruitment of the targeted population extremely challenging. In terms of resources to support LSAMP, it appears that there may have been some miscalculation regarding the availability of carry over funds from Phase I to Phase II. Interviewees emphasized that resources provided through LSAMP are limited. According to the interviewee, figuring out the best place to insert the program into the existing institutional structure has yet to be fully realized. This situation may have played a role in the research mentors' lack of understanding of program goals and objectives. Overall, there appears to be a strong commitment at the institution to enhance the participation of URM populations in STEM at the institution; however, efforts may need to be increased to build the campus identity of LSAMP, which by design may provide benefits that are not primarily fiscal in nature.

Institution C

Eight students participated in four focus groups conducted at this institution. Among the students, 62.5% were male and 100% African-American. Three of the student sessions were 30 minutes in length and one an hour, with the shorter times consisting of make-up sessions for individual participants. In addition, two focus groups each one-hour in length were conducted

with six research mentors. Lastly, three LSAMP administrator interviews were conducted of a faculty member serving as the LSAMP coordinator (1-hour), a decanal-level administrator who oversees data collection/assessment (1-hour), and a representative from the admissions office (30 minutes).

Students

Table 3 provides participant responses of their perception as to whether or not particular goals and objectives are associated with the LSAMP program at their institution.

Table 3 – Students Perceived Existence of LSAMP Goals and Objectives		
	Yes	Unsure
Improved Enrollment	100%	N/A
Improved Retention	86%	14%
Enhanced Academic Performance and Achievement	100%	N/A
Acquisition of knowledge and proficiency	100%	N/A
Research Skills	100%	N/A
Successful application to graduate school in a STEM discipline	100%	N/A

There was consensus among students in terms of their perceptions of LSAMP goals and objectives. The one exception pertained to the item “Improved Retention” where 14% were unsure. On a scale of 1 to 5 (with 1=poor and 5= excellent), 86% of the participants rated the LSAMP coordinator a 5 and 14% providing a rating of 4. The following explanation was provided by one student in relation to the rating of 4: “I feel like the only thing that _ could really improve on is maybe finding different types of research opportunities. __ pushes me to find opportunities on different campuses and different summer programs, but I could really use assistance in finding those things because I don’t know exactly where to start looking.”

On the same scale, students rated their LSAMP compensation (including room, board and a stipend) as a 5. All participants indicated that they were “satisfied” with their LSAMP sponsored research experience. At the time of the site visit, nearly 9 in 10 participants had not presented at a conference. The following statement was noted to help illustrate the benefit of participation in LSAMP by a chemistry major:

My greatest benefit was to be introduced to research in my major and being able to experience the research opportunity. I might not have been doing anything without the LSAMP program.

Research Mentors

All of the research mentors participating in the focus group claimed to have at least a verbal understanding of LSAMP goals and objective. All mentors agreed that the current coordinator was instrumental in their understanding of LSAMP goals. Approximately, 83% of the mentors were content with their compensation. Significantly, all agreed that expectations of them are in line with what they understand to be in the grant.

Perceptions varied on the preparedness of the students to conduct research upon entering a mentor’s lab. Below are illustrative comments:

There is great variability in terms of preparation. Some students come in with a decent background in the sciences to the point where they are able to perform relatively quickly on the required procedures. It really depends on the lab and how [well] prepared the student was in high school.

I think they are as prepared as I would expect them to be. The person that I had was a pre-first year student and so I didn’t expect them to be a super researcher or highly skilled. I viewed it as part of my role to help them develop some skills.

...I have had both pre-first years (LSAMP) and current students, and for each of their respective preparations I think they were perfectly fine. In other words, the pre-first year students had not had any college classes and so they didn’t have any conceptual background, but they participated and learned techniques and meshed with the lab perfectly well.

In terms of perceptions of the program management, research mentors viewed the coordinator in a positive light. One mentor stated:

__ does such a good job...is very hands-on and organized which makes it easy on our end. As long as I am provided access to the students to work in the lab—I'm happy to participate.

Another mentor added:

... is a wonderful cheerleader for the program...also goes out of ... way to find people to discuss the importance [of the program] and make sure they realize the importance of bringing people into the family or team.

Furthermore, all research mentors agreed that the executive level administrators at the institution supported of the LSAMP program. Here is what one mentor said:

...I've been here __ years, and I've never heard anyone__ the dean or the president __speak specifically about the LSAMP __but I know that they are in favor of it and are thrilled when we are working with LSAMP students.

When asked whether research experience influenced the academic performance of their protégés, one mentor replied:

I would say yes. My evidence is when previous students have said things like, "I got more confident in the lab working on problems. I didn't know what I was doing the first week, but by the end of the summer, I knew what was going on. They developed confidence that carried over to the coursework.

Another mentor remarked:

We are doing genetics, learning persistence and patience and trying to figure out how all the pieces of the puzzle fit together. [Students are]

learning the problem solving and critical thinking skills that they can then use in the class. If they are struggling with problems, they can learn to be persistent and patient and figure out the problem.

Research mentors provided significant feedback on the recruitment of LSAMP participants. One mentor explained:

When we were reviewing a roster of prospective first-year students who had been offered admission, there were individuals who seemed reasonable to recruit. When you are trying to recruit students out of the entire incoming class, that's a small number. And that's the challenge that I think we face.

Another mentor had this to say about the potential benefits of LSAMP:

I think that LSAMP is helpful because if I'm talking to a first-year student who is on the fence about whether to come here or not, and offer her a six-week internship...I can't help but think that is going to sway her decision to come.

Administration

The institution had clearly established goals and objectives for LSAMP. All of the administrators interviewed said they were "satisfied" with the compensation they receive for their LSAMP responsibilities, some 33% viewed their duties as part of the institutional mission. The current coordinator admitted being initially challenged when assuming the role, but now has strong grasp on the position. The coordinator is strategically placed within an executive administrative office which compliments recruitment and supports participants. Although LSAMP does not directly fund academic support activities, an individual from an administrative office gathers data related to academic performance and retention, as well as assessment of

research experiences. As a result, students experiencing academic challenges can be quickly identified and steered toward proper institutional resources.

In terms of recruitment, the target for African-Americans was met, making up all of the participant population. However, no Latinos were recruited as initially proposed. One administrator did express a challenge with the timing of recruitment, believing that it does not always align well with that of the admissions office. The aforementioned administrator went on to say that LSAMP can be used to attract students to the institution, but success can only be claimed if the student actually enrolls

All LSAMP participants continue to be enrolled as STEM majors. All interviewees had an awareness of the Alliance. However, they were able only to provide minimal insight into benefits derived from being a partner outside of the research symposium. The coordinator noted that the predecessor had a more defined relationship with partner institutions. One administrator provides the following insight into how the Alliance can be enhanced:

...I think opportunities for African Americans in the sciences and math are sort of limited... anytime [African-Americans] are doing research in a similar field, I think that it would be a great thing to connect them. If a student here is doing research in chemistry and a student at [partner institution] is doing research in chemistry __it's a great way to connect them. They might even learn from each other and they might even encourage each other to continue in the field of the sciences.

Summary

Students and mentors alike attributed many of the successes of LSAMP to the current coordinator. The coordinator has made the program a priority. The interviewees praised the coordinator's extraordinary commitment citing that: “ __'s role often extends beyond what is expected in terms of duties.” Another key to success appears to be that the institution has not created goals that are overly ambitious for the extant resources. The institution has strategically

attached LSAMP-related responsibilities to key individuals across campus offices that allow for a more fluid implementation of the programs initiatives. The institution has done well at accomplishing its established goal of providing pre-freshmen research experiences, as well as the retention of all LSAMP students in STEM related majors. Documented efforts have been made to secure EPSCOR funding to support student research experiences, which is in line with one of the goals of the Alliance. Students appear to desire more from the program outside of the partner's current focus of research experiences given that they have come to view the program as an opportunity for minority STEM students to bond.

Some internal evaluation specifically focused on the lab experiences of participants does occur. However, there is no evidence of evaluation of other program components. Executive level administration seems very supportive of program.

Below are representative comments from student interviewees concerning suggestions for improving their program experience:

- Offer more networking opportunities, especially involved in research
- Expand opportunities to engage more students
- More discussion about career opportunities
- Stronger efforts should be made to schedule Program activities that do not conflict with class scheduling because it is difficult to meet requirements
- Improve communications regarding deadlines, meeting dates and locations
- Provide more opportunities for STEM majors who are not pre-med or pre-dentistry
- Need to be better organized in scheduling meetings
- More information about 'Bridge to the Doctorate'
- More team 'bonding' through group activities

Surveys

Because of the low overall response rate (29 percent) and uneven response rates (no one responded from one-third of the nine institutions), the following analysis must be read with caution.

Demographics. Approximately 71% of the respondents were women. A substantial majority of the respondents self-identify as Black (86%) or White (17%) and non-Hispanic (90%). Slightly more than half (55%) were freshmen and sophomores. Only 10% reported being a transfer from another institution. When asked how they learned about the Kentucky/West Virginia LSAMP, most reported from a professor (31%), a peer (26%) and advertisement (24%).

College major. Before entering college nearly 9 in 10 respondents intended to major in a STEM field (*mostly Life/Biological Sciences*). However, 4 in 10 changed major once matriculating in college, usually from one STEM field to another. Slightly more than half (52%) switched fields in their first year of college, while more than a third did so in the sophomore year. Below are representative comments for field switching:

- “More job opportunities in chemistry than biology”
- “Chemistry was more fascinating than biology”
- “Biology was a better “fit”
- “After speaking to former high school teachers, engineering provided more career advantages than math education”
- “I took a physics course that stimulated me to take more [physics] courses”
- “I wanted to teach high school physics rather pursue an engineering career”

Activities. Overall, *two-fifths* of the respondents indicated that they participated in LSAMP research, professional development and/or tutoring activities. Participation in these activities were rated as “beneficial” or “very beneficial”.

Slightly less than half (48%) of respondents indicated that LSAMP staff at their institutions had advised them about a scientific career. Nevertheless, nearly 70% of the respondents reported that they were “*satisfied*” or “*very satisfied*” with the career advice.

Academic Experiences. Respondents rated their preparation for advanced coursework in their major as 3.8. Nearly 8 in 10 indicated that they were “satisfied” or “very satisfied” with their overall academic performance this year. Of the 41 respondents taking science courses, 63% indicated that were “*satisfied*” or “*very satisfied*” with their academic performance. In contrast, 59% of those (N=35) taking math courses reported such ratings. When asked about their level of satisfaction with the support they received from their LSAMP staff, nearly 7 in 10 indicated that “*satisfied*” or “*very satisfied*”.

Research Experience. Approximately, 73% of the respondents (N=15) who participated in a 2014-2015 academic-year research experience rated their satisfaction with the activity as “*satisfied*” or “*very satisfied*”. Roughly a third of the respondents participated in a 2015 summer research program, primarily at their home institution. Some 93% of these students reported that they were “*satisfied*” or “*very satisfied*” with their summer research experience. All respondents reported that their research experience was “*beneficial*” or “*very beneficial*”. In the case of both the summer and academic-year research experiences, a faculty member played the major role in assisting the students in securing the opportunity. LSAMP staff ranked second in assisting the respondents to secure summer research experiences.

When asked to rate their research skills on a 5-point scale, respondents assigned an average rating of 3.7. Generally, few respondents attended academic-year (*nine*) or summer (*five*) conferences. In terms of presentations at conferences, two academic year and four summer respondents affirmed presentations during the 2014-2015 academic-year and summer, respectively.

Postsecondary Plans. The vast majority of respondents expect to graduate in their current major (95%) and pursue a STEM-related career (87%). Some 85% reported plans to apply for graduate or professional school. In terms of postsecondary education, slightly more than a third aspired to the *MD degree*, slightly more than a fourth and a fifth aspired to the *Ph.D.* and *Master's*, respectively.

Program. Respondents rated their LSAMP Program as 4.0. Except for *one* respondent, all reported that they would recommend the LSAMP Program to a peer. After graduating from college, approximately 91% would be willing to complete a survey relevant to their career and education experiences.

Conclusions

Employing a 5-point (5=highest) rating scale of “high” to “low”, Institutions A, B, and C would be rated, 3, 2 and 5 respectively. Correspondingly, there was variation in terms of stature of the individual managing the day-to-day program activities. At one institution, the individual was a LSAMP student participant. Although non-students managed the other sites, one person was well trained and experienced, while the other individual was relatively new to the position. Significantly, the differential role performances of these individuals was evident in the level of organization for the evaluator’s site visits. For example, at one site none of the LSAMP-designated students presented themselves for the focus group interview.

At another site, the research mentors were not scheduled, despite the fact that the evaluator had coordinated with the campus coordinator regarding the scheduled visit. At Institution A, student interviewees expressed concern about what they described as the program's overrepresentation of 'pre-med' students. These interviewees indicated that the recruitment pattern seemed at odds with the goals of LSAMP Program to increase the number of underrepresented minorities earning STEM graduate degrees. As mentioned, one-third of survey student respondents reported plans to pursue the MD degree.

Institution C was rated as "high" functioning because it was exemplary on all evaluation metrics. Moreover, all interviewees had: (1) a clear understanding of the goals of the program, (2) detailed knowledge of the various components of the program and how they were integrated into the institutional culture and (3) participated in the interviews.

Although student survey respondents identified some areas of concern, they generally reported positive experiences in their respective programs. Because of disproportionate percentage of the respondents were underclassmen, it is not surprising that they assigned moderate ratings to their research skills. Similarly, most had not presented a paper or poster at a conference. However, most students had been engaged in research experiences at their home institutions. The vast majority were "satisfied" or "very satisfied" with their experiences. Moreover, respondents rated the quality of their program extremely positively. Nevertheless, some of their concerns mirrored those mentioned above by interviewees.

Finally, the visits to case study institutions confirmed last year's findings that some administrative challenges related to the transition from *Phase I* to *Phase II* remain. In particular, one case study site coordinator reported struggling to implement *Phase II* primarily because of inadequate resources. As was the case last year, some partner

institutions continue to operate largely as silos rather than an active Alliance partner. In general, interviewees were less aware of their institutional relationship with the central office. In fact, many seem to view the symposium as the central connection. Some challenges stem, in part, from institutional program staff turnover and limited institutional resources.

This year, the Alliance began to make significant progress towards becoming more cohesive. As recommended in the 2015 summative evaluation report, a dedicated administrator was hired at the central Alliance institution in July. The project director transitioned from another LSAMP program. During Fall and early spring, the project director conducted site visits to member institutions. Undoubtedly, the visits probably brought home the reality articulated in last year's external evaluation report. That is the Alliance operates less as a cohesive, highly functional body committed to the goals and objectives of LSAMP and more as collection of assorted institutions of varying levels of functionality. To this point, it is unreasonable to expect even an experienced project director to completely reverse course of a fragmented Alliance in one year. Yet, the project director has made significant headway address some outstanding issues. To the project director's credit, considerable progress has been made in the following critical areas:

- Systematically organizing institutional reports into a cohesive e-report
- Developing and implementing electronic data and information files
- Coordinating report deadlines
- Planning and implementing meetings and events
- Developing a strategic plan for community building
- Managing the day-to-day operations of the Alliance office.

- Visiting the sites and offering assistance

The confluence of these efforts will likely shore up the organizational structure that will lead to a more cohesive and functional Alliance. Certainly, the case study site coordinators expressed confidence that things were heading in the right directions to reach the goals outlined in Phase II. In the next section, some suggestions for further improving the program are offered.

Recommendations

- Continue to build on the steps taken to address the 2015 recommendations.
- Some coordinators raised concern that their institutions were struggling to support the level LSAMP activities agreed to in Phase II because promised institutional resources have not been forthcoming. It is recommended that the Coordinator investigate the extent to which this is a problem.
- All partners should engage in a joint process to review and implement required goals and objectives that encourage operation as an Alliance, more specifically the development of intercampus digital communities, as well as the sharing of resources and best practices.
- Provide formal orientations for all research mentors, compensated administrators and students. Institution C has developed an orientation presentation that could serve as a potential model for all Alliance sites.
- Enhance summer research opportunities for students external to their respective campuses.
- For those institutions with goals of increasing Hispanic student participation, document the extent to which they are achieving this goal.

- While Alliance partners are encouraged to continue collaborations with LSAMP related efforts on their respective campuses, it is essential that LSAMP participants be properly tracked and/or labeled once integrated into such efforts. There were situations with two case studies where data reported included students that fit within LSAMP demographically, but were not indicated on the roster provided to the evaluator.
- Alliance coordinators should review the range of majors that participants are enrolled in at their respective institutions and insure that program activities and services reflect their findings.
- Despite advanced planning, two of the three case study sites seemed ill-prepared to ensure that the interviewees actually showed up. In conjunction with the evaluators, the Alliance Director should hold a brief orientation regarding the nature and structure of evaluations with sites selected for next year's case studies, and the criticality of participating in focus groups and interviews.
- The Alliance Director is strongly encouraged to work with campus coordinators to develop a relational database (e.g., including demographic information) that has an authenticated list of documented LSAMP participants.

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APPENDIX E

CHARLENE WALKER
BCTC VICE PRESIDENT OF
MULTICULTURALISM & INCLUSION
AND KY-WV LSAMP COORDINATOR
RECEIVES URBAN LEAGUE OF
LEXTINGTON'S 2015 INDIVIDUAL
CHAMPION OF DIVERSITY AWARD
OCTOBER 2015



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HIGHER EDUCATION BEGINS HERE

BCTC's Charlene Walker Named 'Individual Champion of Diversity' by the Urban League of Lexington

The Urban League of Lexington has awarded its 2015 Individual Champion of Diversity to Charlene Walker, vice president of Multiculturalism and Inclusion at Bluegrass Community and Technical College (BCTC). The award was given at the league's Annual Empowerment Banquet on Monday, Oct. 19.

The Urban League's annual diversity awards are presented to recognize an individual and a business that embrace, celebrate and apply holistic inclusion and participation of a diverse people.

Walker has spent her career creating and directing activities that give students their best opportunity to be successful. At BCTC, she has supported Latino Outreach, International Students and Scholars Services, Diversity Outreach, Intramural Sports, Ready-to-Work, and BLINKS, a program for students transferring to Kentucky State University. She has administered grants with operating budgets of over \$2.3 million. She is sought after as a speaker at state and national conferences on issues related to sexism, racism, and classism, and is a member of numerous civic and community organizations including Kentucky Organ Donors Association, the Planning Committee for the annual Lexington Martin Luther King, Jr. March and Celebration, and the University of Kentucky Appalachian Center.



Dr. Augusta Julian, president of BCTC, nominated Walker in recognition of her impact on students' lives. "Charlene is one of the most committed student advocates I have ever worked with. Her commitment to inclusion and student success drives her work and has resulted in hundreds of students who are working in their dream careers today. Her creation of an annual diversity conference has also given students and partner institutions support to reach their goals. We are very proud of her."

###

About the Urban League of Lexington: The Urban League is a nonprofit organization in Lexington - Fayette County. Their mission is to assist African Americans and disadvantaged citizens in the achievement of social and economic equality. For more information go to: <http://www.ullexfay.org>.

APPENDIX F

30th NATIONAL CONFERENCE ON
UNDERGRADUATE RESERACH
KY-WV LSAMP CONFERENCE COLLAGE
UNIVERSITY OF NORTH CAROLINA
ASHVILLE, NORTH CAROLINA
APRIL 7-9, 2016

NCUR

UNC Asheville
30th Annual Conference

April 7-9 2016



Danielle Chavis, WKU



Trevor Claiborn, KSU



Nathan Crowds, WKU



Logan Douglas, UK



Sabita Dumre, UK



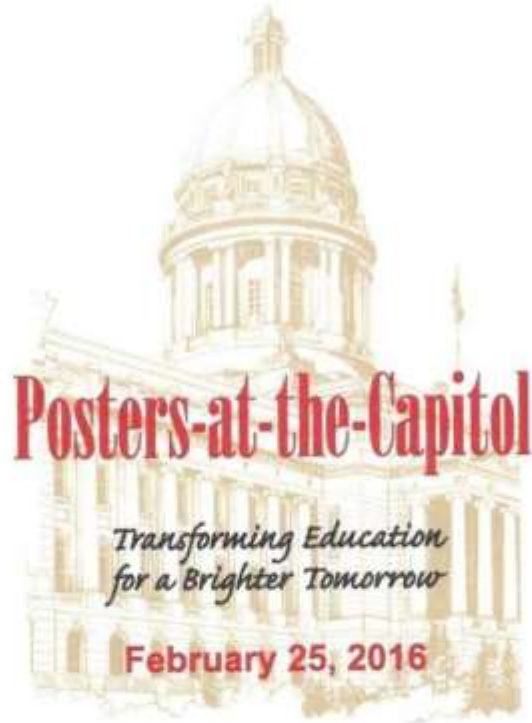
Ashley Pittman, UK



APPENDIX G

KENTUCKY
POSTERS AT THE CAPITOL
FRANKFORT, KENTUCKY
FEBRUARY 25, 2016

NORTHERN KENTUCKY UNIVERSITY • UNIVERSITY OF KENTUCKY
UNIVERSITY OF LOUISVILLE • WESTERN KENTUCKY UNIVERSITY • KENTUCKY COMMUNITY AND TECHNICAL COLLEGE SYSTEM • EASTERN KENTUCKY UNIVERSITY
KENTUCKY STATE UNIVERSITY • MOREHEAD STATE UNIVERSITY • MURRAY STATE UNIVERSITY



Posters-at-the-Capitol is designed to celebrate the research, scholarly, and creative experiences of undergraduate students at Kentucky's public institutions of higher education. It provides students with the opportunity to present their projects to state legislators and to impress upon them the importance of faculty-mentored projects to the overall education of Kentucky students. Poster presentations are being sought from undergraduates in ALL DISCIPLINARY AREAS.

Abstract Deadline:
Wednesday, October 14, 2015

Register at:
<http://campus.murraystate.edu/services/URSA/>

Please call (270) 809-5040 or e-mail jcofer@murraystate.edu with questions.
Equal education and employment opportunity M/F/D, AA employer

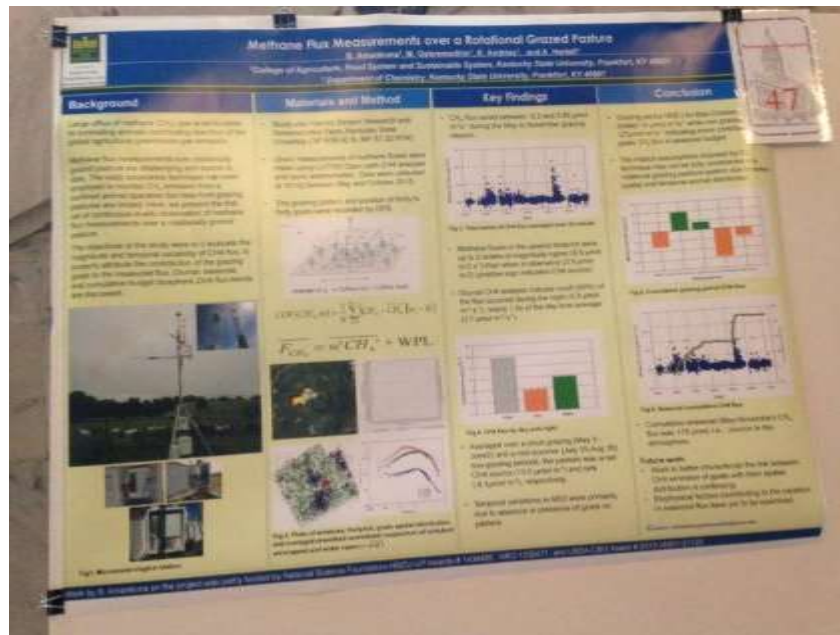
47. Amber Hartell, Boniface Amankona, and Sait Sarr

Kentucky State University

Mentors: Maheteme Gebremedhin, Buddhi Gyawali, and Kenneth Andries

Methane Flux Measurements over a Rotational Grazed Pasture in Northern Kentucky

Minimizing excessive losses of protein and reducing nitrogen wasting bacteria in ruminants has long been noted as the main determinants of methane (CH₄) produced by ruminants. Enteric fermentation from ruminating animals is the second largest global source of CH₄ thus has received a great deal of attention in recent decades. These concerns highlight the importance of accurate CH₄ quantification for determining the CH₄ source or sink status managed with intensively rotational grazed pasture. We measured CH₄ flux over a small paddock rotationally grazed with 40-70 goats managed in a rotational grazing system. We used the eddy covariance (EC) technique, at Kentucky State University (38° 6' 56.42" N, 84° 0' 53" 22.81" W). To investigate the grazing pattern of the animals relative to the tower location and to properly attribute the contribution of the goats to the measured flux, the position of 12 goats were tracked with GPS recorder both in the upwind and downwind areas (footprint). Diurnal CH₄ analysis indicate much of the flux occurring during the night (5.9 μmol m⁻² s⁻¹), nearly 1.5x of the day time average (3.7 μmol m⁻² s⁻¹). Consistently, the cumulative CH₄ flux was the highest (9.6 μmol m⁻² s⁻¹) when the animals were grazed in the upwind compared to downwind (3.9 μmol m⁻² s⁻¹) (positive sign indicate the pasture was CH₄ source). The average of CH₄ flux from the early summer short grazing period (June to July) was relatively lower than the early grazing season (August 27 to September). Averaged over a short (May 5 - June 2) and an extended mid-summer (July 15-Aug 26) non-grazing periods, the pasture was a net CH₄ sink (-0.01 μmol m⁻²) and neutral (0.01 μmol m⁻²), respectively. This study underscores the importance of livestock methane emission contribution to the total greenhouse gas budget of intensively managed pasture. The contrasting results might also provide information to inform management strategies towards i) increasing the pasture's diet quality for animals and ii) improving the digestibility and thereby reducing the nitrogen wasting bacteria. Both have shown to ameliorate CH₄ emissions from ruminants.



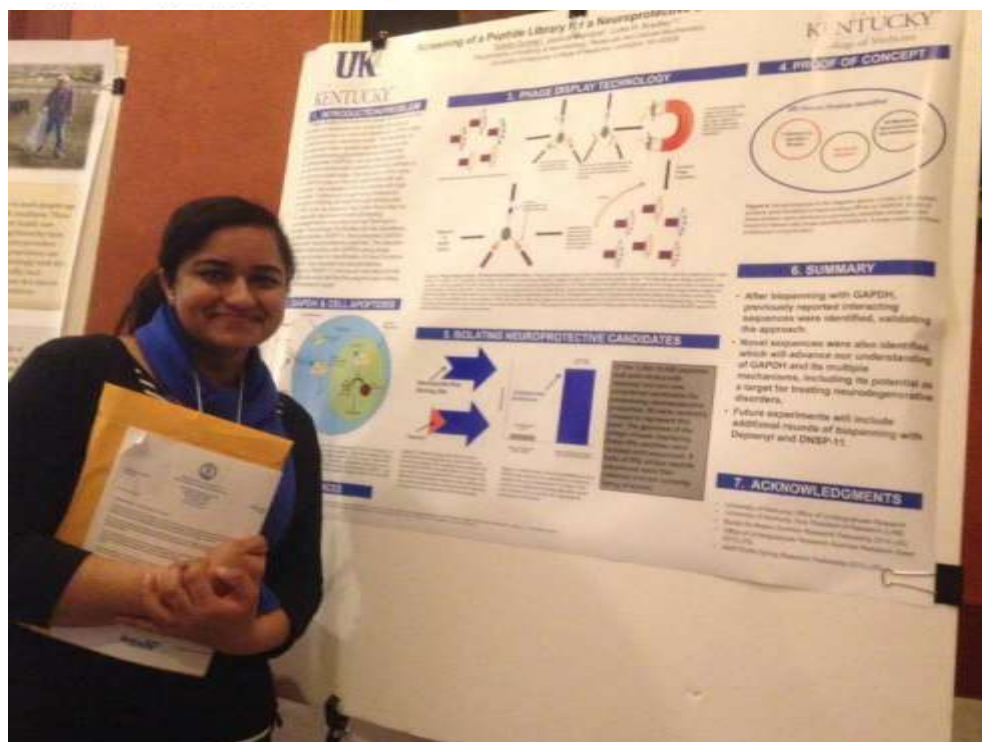
29. Sabita Dumre

University of Kentucky

Mentor: Luke H. Bradley

Screening of a Peptide Library for a Neuroprotective Binding Target

Emerging evidence has shown that the well-known glycolytic enzyme, glyceraldehyde-3-phosphate dehydrogenase (GAPDH), interacts with numerous binding partners in the cell to perform a wide range of functions, including the mediation of cell apoptosis. The subsequent identification of small molecules that inhibit apoptosis and provide neuroprotection in cell culture and animal models, through their binding interaction with GAPDH, suggests that this protein may be a potential target for the treatment of neurodegenerative disorders. With the emergence of combinatorial library design and screening strategies, peptides provide an attractive scaffold to select individual sequences in the laboratory with desired interactions with a defined target, from a large collection of candidate sequences. In this project, we utilized phage display to screen trillions of unique peptide sequences for interactions to GAPDH. Multiple rounds of biopanning and amplification enriched the library over 10 billion-fold for binders to GAPDH. Preliminary analysis of selected peptide sequences has identified members known to interact with GAPDH, as well as novel sequences which could elucidate other cellular interactions as well as possibly be considered candidates for future cellular neuroprotective studies.



75. Maya McFrazier, Xiaoxian Duan, Diane E. Renaud, Richard J. Lamont, and Huizhi Wang

University of Louisville

Mentor: David Scott

Nucleoside diphosphate Kinase-Dependent Suppression of Apoptosis in Esophageal Cancer Cells by the Oral Pathogen Porphyromonas Gingivalis

Esophageal cancer is the eighth most frequent tumor and sixth leading cause of cancer death globally. Recent evidence suggests that a Gram negative, anaerobic bacterium that is a causative agent of periodontitis, *Porphyromonas gingivalis*, is strongly associated with esophageal cancer. Indeed, *P. gingivalis* infection strongly correlates with disease stage and survival time. However, the potential mechanisms by which this important oral pathogen may predispose to the development of esophageal cancer are entirely unknown. It has previously been established that *P. gingivalis* produces a nucleoside diphosphate kinase (NDK) that can promote epithelial cell survival by hydrolyzing extracellular ATP and preventing apoptosis initiated by the purinergic receptor, P2X7. Therefore, we set out to determine if *P. gingivalis* was able to inhibit drug-induced apoptosis in esophageal cancer (KYSE-30) cells, hypothesizing that this phenomenon may be dependent upon a functional *ndk* gene. Camptothecin, derivatives of which are being tested for treatment of esophageal cancer, induced apoptosis in KYSE-30 cells. Infection with wild type *P. gingivalis* inhibited CAMP-induced esophageal cancer cell death, whereas *ndk*-deficient *P. gingivalis* mutants were less efficient in blocking apoptosis. Therefore, the epidemiological association noted between *P. gingivalis* and esophageal cancer may be partly explained by NDK-dependent inhibition of apoptosis.

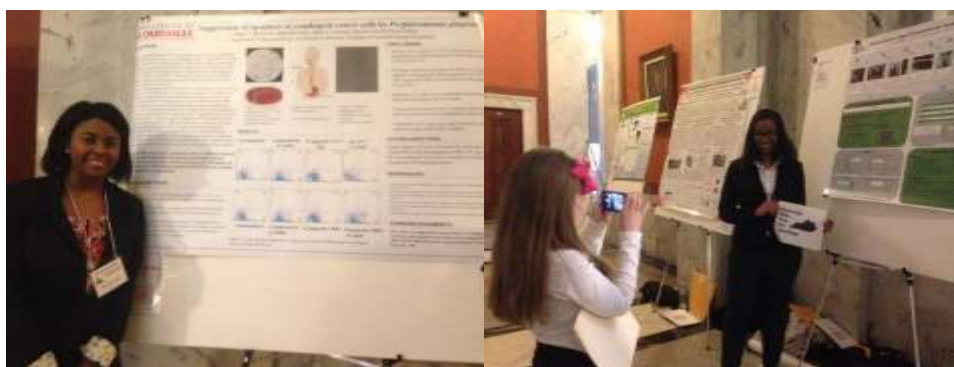
76. Courtney McKelphin

University of Kentucky

Mentor: Mark Crocker

Optimization of Microalgae Lipid Extracts for the Production of Fuels

The new federal rules designed to reduce CO₂ emissions from power plants demand innovation in the field of carbon capture and utilization. The use of algae to sequester CO₂ from coal-fired power plants constitutes an interesting solution, particularly because algae can intermediate the conversion of these emissions into valuable fuels and chemicals. Our previous research showed that this approach was feasible from a technical standpoint, current work being focused on cost reduction. Past work has shown that oil can be extracted from algae and converted to hydrocarbon fuels that are fully compatible with existing infrastructure. To date efficient extraction of the oil has required that the algae are first subjected to an energy intensive and costly drying step. To improve the economics of the extraction process, we have investigated the extraction of oil from wet algae grown using the flue gas of a Kentucky coal-fired power plant. The research conducted in this project tested the extraction efficiency of sonication, mechanical disruption methods (milling and beating), suspension in supercritical hexanes and a modified Bligh-Dyer solvent extraction method (employing a CHCl₃/CH₃OH/H₂O solvent system). From these studies it is concluded that the optimal methods in terms of the oil yield are suspension in supercritical hexanes and the modified Bligh-Dyer method. The lipid profile and elemental analysis of the oils extracted using these methods provide valuable insights regarding the effect of the extraction method on the composition of the oil obtained.



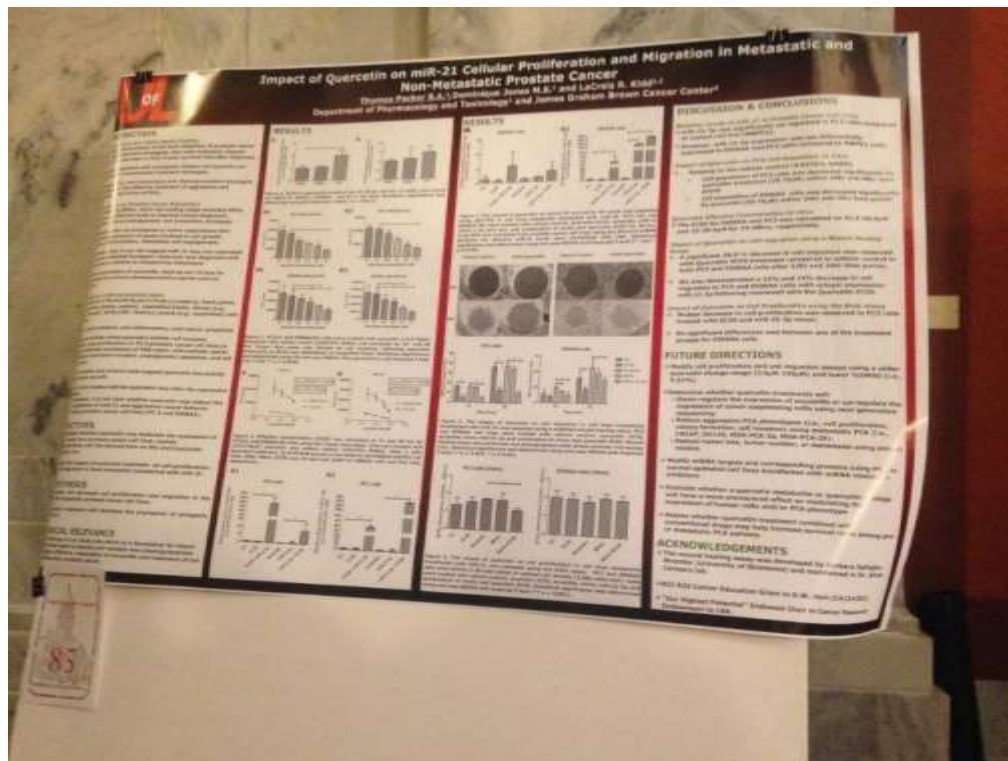
85. Thomas Packer

University of Louisville

Mentor: La Creis Kidd

Impact of Quercetin on miR-21, Cell Proliferation and Migration of Metastatic and Non-Metastatic Prostate Cancer Cell Lines

The over-expression of oncogenic microRNAs (miRs) may be counteracted by chemopreventive agents. Quercetin inhibits aggressive PCA (cell invasion, migration, proliferation) in vitro and modulates the expression of selected miRs in vivo. However, it is not clear whether quercetin modulates miR-21 expression and cancer behavior in African-American derived PCA cell line (E006AA). We hypothesized quercetin would decrease cell proliferation, migration and miR-21 levels in a metastatic (PC-3) and non-metastatic PCA cells (E006AA). After E006AA and PC3 cell were plated and treated with quercetin, cellular proliferation at 24 and 48 hrs was assessed with Trypan Blue and BrDU assays. For the cell migration assay, treated and untreated cells were plated onto silicon cell culture plates with five 2mm plugs. After removing the plugs, the area was photographed and quantified at 8-16 hrs. MiRNA levels were determined by qRT-PCR. There was a modest decrease in cell proliferation for PC3 and E006AA cells treated with quercetin (12.5-75µM) compared to vehicle control under the Trypan Blue assay. These effects only persisted in PC3 cells treated with 23µM quercetin under the BrDu assay. Quercetin treatment (23-39.475µM) revealed a 23 and 14% reduction in cell migration at 48hrs in PC3 and E006AA cells. The impact of quercetin on cell proliferation and migration is not mediated through a reduction in miR-21-3p. The findings of our study may serve as a foundation for future studies that seek to identify and validate new treatment strategies for individuals susceptible to pre- and metastatic PCA. Research was supported by NCI grant R25-CA134283



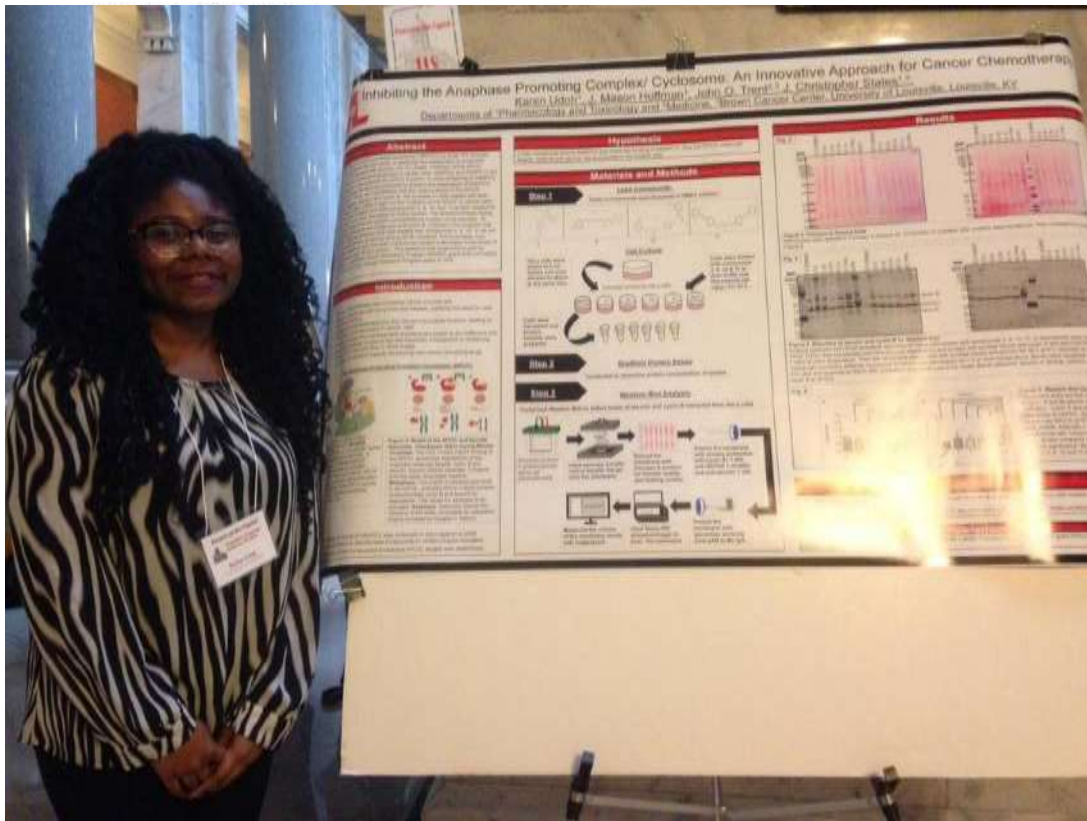
118. Karen Udoh

University of Louisville

Mentors: J. Christopher States, Jouett Mason Hoffman, and John O. Trent

Inhibiting the Anaphase-Promoting Complex/Cyclosome: An Innovative Approach for Cancer Chemotherapy

The anaphase promoting complex/cyclosome (APC/C) is a large, E3 ubiquitin ligase that regulates the cell cycle, in particular the metaphase to anaphase transition in mitosis and the re-entry into G1 phase. Inhibition of the APC/C results in mitotic arrest and apoptosis in cancer cells. ANAPC2 and ANAPC11 are shown to be two vital subunits for APC/C function. *in silico* screening of ANAPC2 identified compounds that are predicted to prevent the association of ANAPC2 and ANAPC11. Thus, we hypothesize that the relative levels of the APC/C molecular targets, securin and cyclin B, will increase in cells treated with lead compounds. To gain better insight on the inhibition of the APC/C in cancer cells, HeLa cells were treated with lead compounds 3, 8, 10, and 11 at their respective IC50s for 24 h and then harvested to make lysates. The Bradford Protein Assay was used to determine the protein concentrations in each of the samples. To examine the relative levels of securin and cyclin B, a western blot analysis was performed. Results showed that cells treated with compounds 3, 8, 10, 11 do not have increased levels of securin and cyclin B. However, future analysis may reveal that treatment with the lead compounds causes a decrease in the levels of ubiquitinated cyclin B and securin. This research was supported in part by University of Louisville Cancer Education Program NIH/NCI grant R25-CA134283 and a Kentucky Lung Cancer Research Program grant to JCS.



APPENDIX H

WEST VIRGINIA
RESEARCH DAY AT THE CAPITOL
CHARLESTON, WEST VIRGINIA
FEBRUARY 25, 2016

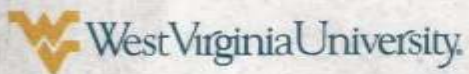
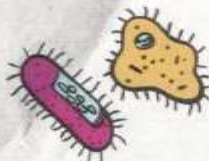
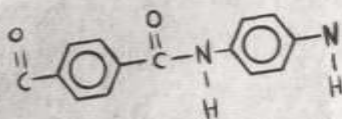
13th Annual Undergraduate

RESEARCH

DAY AT THE
CAPITOL

February 25,

2016



**80. Leaf Angle Phenology of Twelve Central Appalachian Tree Species:
Implications for carbon and energy fluxes**

Evelin Flamenco (Maryland)

Institution: West Virginia University
Field: Geography
Faculty advisor: Brenden McNeil

The effects of temperate forests on the global cycles of carbon and energy depends in part on human actions, but also strongly upon how individual tree species adjust to the novel environmental conditions of the Anthropocene. In this study, we seek to identify how one adaptation, the inclination angle of leaves, differs by species and season. Leaf angle is known to have important effects on forest albedo, photosynthesis, and evapotranspiration, but there is relatively little data on its variation among species, seasons, and environmental gradients. For this study we employed a relatively new technique for using an electronic protractor to measure leaf angles on leveled digital photographs of the upper canopy of trees. From a suite of observation platforms (e.g. fire towers, bridges) in the Central Appalachian Mountains, USA, we measured leaf angles on the same set of marked branches each week (one platform) or month (5 platforms) throughout the 2015 growing season. Based on over 7,000 measurements taken from 12 tree species, we found significant differences in mean leaf angle, and leaf angle distribution between species, location, and observation time. We discuss these empirical results in light of an emerging theoretical framework that positions leaf angle phenology as a functional trait that is not only an essential part of the adaptive resource strategy of each tree species, but also could be used to better constrain model predictions of energy and carbon fluxes from temperate forests in the Anthropocene.

Funding: NASA West Virginia Space Grant Consortium



86. Characterization of a Novel Zinc Finger Protein Using Molecular Techniques

Kristen Mastrantoni (Hancock County, West Virginia)

Institution: West Virginia University

Field: Biology

Faculty advisor: Jianbo Yao

Zinc finger transcription factors (ZNF) containing the Kruppel Associated Box (KRAB-ZNF) belong to a large, highly conserved class of proteins encoded by mammalian genomes. ZNFs function in the cell as regulators of transcriptional activity by controlling gene expression of important functional processes such as embryonic development. Recently, an abundant transcript exclusive to the mammalian oocyte has been identified as a KRAB-ZNF containing nine zinc finger motifs at its C-terminus. The discovery of this novel protein, ZNFO, has prompted further investigation into its functional role. A luciferase assay was conducted to confirm the predicted repressive function of ZNFO. Luciferase expression was significantly lower ($p < 0.05$) in cells transfected with a ZNFO containing vector, suggesting that ZNFO is a repressor of transcriptional activity. Prior subcellular localization experiments have demonstrated the nuclear localization of ZNFO. Subcellular localization experiments using truncated variants of the gene were conducted to determine the domain responsible for nuclear localization of this protein. Preliminary results suggest that the first three zinc finger motifs are involved in ZNFO nuclear localization. These experiments will establish a basic characterization of ZNFO and will provide further insights into its function. It is suspected that this novel protein may be a key regulator of embryonic genome activation. Insight into the biological function of the novel ZNFO may enable its use as a biomarker to predict embryonic loss.

Funding: NSF Louis Stokes Alliance for Minority Participation

89. The Effect of Height and Gender on the Range of Arm Motion

Ryan North (Virginia)

Institution: West Virginia University

Field: Engineering

Faculty advisor: Marvin Cheng

The long term goal of this study is to design and fabricate an interactive wearable robotic device that can help stroke patients or senior adults to rehabilitate and perform in their ADLs (Activities of Daily Living). To achieve this goal, the proposed robotic device needs to be portable and light weight. One major consideration for such device is having enough degrees of freedom to maintain a minimum range of motion. The research topics of this project include: hardware development, firmware and controller development, and identification and modeling of human arm motions. In the mechatronic system research lab, we have developed a prototype of the wearable robotic device, as shown in Figure 1.

This pilot study will focus on 5 specific motions that the participants are required to complete. The selected motions such as pick up an object overhead, are designed to simulate motions that are completed on a daily basis. Furthermore, these motions target the motions that are believed to be the most important when completing daily activities. The trajectories of these 5 motions are acquired from healthy adults with different physical conditions, such as height, gender, and age. The participants' motions were recorded using a Microsoft Kinect.

The Kinect records the trajectories in which the participants complete each of the tasks. It does this through recording the positions of selected points using optical and infrared sensors. The data was then exported into MATLAB for analysis using Dynamic Time Warping (DTW) so that the trajectories can be compared within the same time interval. This allows relationships between the trajectories with respect time to be found. The trajectories of the same motions are divided into individual groups based on the participants' physical conditions. A similarity index (SI) were used to evaluate the similarities among these groups. From the analyzed data, the significant trajectories are given more emphasis as they will restore more motion to future patients. Trajectories with better SIs will be used to generate reference trajectories for patients with similar physical conditions. These derived expressions will then be implanted into the robotic supplement.

Funding: McNair Scholars Program



Figure 1. CAD drawing of the proposed robotic device.

93. Statewide Dissemination of a Culinary Skills, Family Mealtime and Physical Activity Program through HSTA

Matthew Parsley (Mingo County, West Virginia)

Institution: West Virginia University
Field: Agriculture
Faculty advisor: Melissa Olfert

Introduction: iCook 4-H is a five-year, multistate research project that seeks to reduce the prevalence of childhood obesity. The eight session curriculum emphasizes three main concepts: cook together, eat together, and play together among children 9-11 and their adult food preparer. The goal is to educate families on healthy eating, physical activity, and the importance of spending quality time together. iCook follows the fundamentals of community-based participatory research (CBPR) where the dyad pairs, local and state leaders came together to help develop and implement the curriculum and the research intervention. The objective of this study is to investigate the feasibility of disseminating the iCook program among a high school-led research program. **Methods:** Following pilot testing of dissemination using teens as teachers, iCook moved into a full-state dissemination phase in August 2015. For West Virginia, iCook was integrated within high schools through Health Sciences and Technology Academy (HSTA) clubs. HSTA, a high school program that encourages minority participation in STEM fields, requires students to conduct a research project each year and present at the annual symposium. By delivering the iCook sessions, HSTA students are able to experience real, communal-based research from which they can develop research questions. **Results:** The concept of iCook 4-H was presented to HSTA teachers during their annual, statewide meetings. Eleven teachers agreed to incorporate the iCook into their respective clubs. Incentives were given to these clubs which included a video camera, staff t-shirts, curriculum and conversation meal starters. Each teacher received iCook training and instruction on how to train their HSTA students. Quizzes were developed for the students to guide them in recruitment and leading sessions. Session start dates is varied between clubs where some initiated iCook during the fall semester, while others in the spring semester. Fidelity, a value signifying the accuracy of iCook session delivery, will be measured and analyzed after all eight sessions have been delivered. This will gauge the actual delivery from the HSTA students, and assess if the curriculum was presented as intended. **Conclusion:** By collaborating with HSTA, iCook 4-H has the opportunity to be introduced into a wide spectrum of communities throughout a state that has a high prevalence of obesity. Additionally, the experience gained by the HSTA students is the first step into understanding the significance and practicality of CBPR.



APPENDIX I
ADDITIONAL
SCHOLAR HIGHLIGHTS

The screenshot shows the top navigation bar of the reveal.uky.edu website with links for Academics, Athletics, Research, Site Index, UK Directories, and a search bar. The main header features the 'reveal' logo with the text 'UNIVERSITY OF KENTUCKY RESEARCH MEDIA' and a navigation menu with links for HOME, ABOUT US, ARCHIVE, UKNOW, and OUR RESEARCH. Below the header is a video player showing two individuals in a laboratory setting, with a play button icon overlaid. The video title is 'Kentucky NSF EPSCoR Highlight: Courtney McKelphin'.

KENTUCKY NSF EPSCoR HIGHLIGHT: COURTNEY MCKELPHIN

From: Sep 22, 2015 | kbowman

In 2014, the Kentucky NSF EPSCoR (Experimental Program to Stimulate Competitive Research) program was awarded a \$20 million grant from the National Science Foundation to fund their project: "Powering the Kentucky Bioeconomy for a Sustainable Future."

One of the critical missions of this project is to increase graduation rates for underrepresented minorities in STEM-based science disciplines through mentoring and collaboration. To that end, the Kentucky NSF EPSCoR program has established the Research Scholars Program (RSP), which provides funding opportunities for faculty-invented research projects for underrepresented undergrad students in STEM fields.

The benefit of this approach is two-fold. The RSP supports on-going faculty research, while simultaneously providing engaging, hands-on learning experiences for undergraduate students across the state. Courtney McKelphin, a chemical engineering undergraduate at the University of Kentucky, is one of the many students across Kentucky supported by RSP funding.

Working closely with Dr. Eduardo Santillan Jimenez, a Principal Research Scientist at the University of Kentucky's Center for Applied Energy Research (CAER), Courtney had the opportunity to assemble a continuous bioreactor this summer. "Just to see the parts and the pieces—to have put it together and commission it and deal with all the problems of trying to get it to work and software issues, it was an amazing experience," McKelphin said. "I know that my engineering understanding and conceptual background of reactors is a lot stronger now."

McKelphin will continue her research alongside Dr. Santillan Jimenez this fall at CAER. "She is already turning out to be an outstanding researcher," he said. "She's incredibly independent and motivated. For her to bring the pieces out of the boxes and put them together and make sure they're working properly and talking with the manufacturers—I think that experience is invaluable because it is exactly what she'll be doing once she graduates."

For more on Kentucky NSF EPSCoR, visit <http://kysnsfepscor.org>.

Produced by Austin McKinney (Kentucky NSF EPSCoR)



http://reveal.uky.edu/mckelphin_courtney

12/1/2015

Courtney McKelphin, UK, was featured on the Kentucky EPSCoR website.



Farmer Brown Tha MC "Class Room Visitor " (Pilot Episode 1)

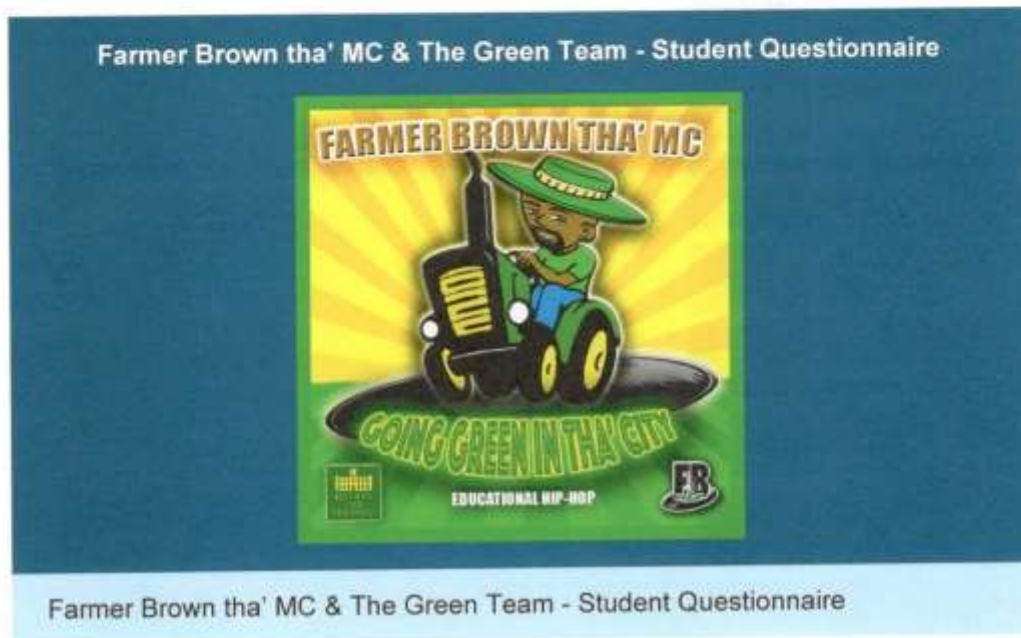
Trevor Claiborn
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Published on Jun 29, 2015
This is the Pilot episode for "Farmer Brown Tha MC" is a hip hop themed educational production series based around Agriculture and Natural Sciences geared toward elementary aged students.



Trevor Claiborne, BCTC transfer to KSU, has created videos for elementary students and posted them on YouTube.

Evelin Flamenco

What advice do you have for undergraduates who are just starting out in research?

Don't be afraid to ask questions if you don't understand a particular task. When you first start, everything is new and it's a learning process.

Publication:

McNeil, B.; Pisek, J.; Lepisk, H.; Flamenco, E. Measuring leaf angle distribution in broadleaf canopies using UAVs. *Agr. Forest Meteorol.* 2015, (Submitted).

When you were 10 years old, what did you want to be when you grew up?

When I was 10 years old, I wanted to be a scientist when I grew up.

What are your current plans/career goals beyond the undergraduate?

After I graduate, I plan to get my masters in Geography.

When did you get involved in undergraduate research?

Spring of Sophomore year.

How long have you been involved in undergraduate research?

I've been involved in undergraduate research for about 8 months.

Why did you choose get involved in undergraduate research?

My plan is to go to graduate school and I believe undergraduate research will prepare me to get the skills that I need to be successful for graduate school.

How did you find/connect with your first faculty research adviser?

I asked a former graduate student about any tips of preparing for graduate school. He was my teacher for Physical Geography and he mentioned a few professors that are involved with research who may need help in their research. I visited Dr. McNeil's office and introduced myself to him, and asked if he needed help.

What is your current research?

My current research project involves measuring tree leaf angles. Leaf angles have an affect on different intensities of albedo, photosynthesis, and water loss through the leaves. During the summer we climbed five fire towers in the central Appalachian Mountains. We situated parallel to the canopy of a tree and placed a camera on a leveled tripod and took pictures. The tree images were taken in June, July and August. With a software program, I analyzed the pictures and each leaf was individually measured perpendicular to the base of the leaf. Also, I have taken weekly images of seven trees from the Pleasant Street Bridge in Morgantown, WV following the same procedures.

What skills have you learned by doing research that you would not have learned otherwise (i.e., from lecture alone)?

The skills that I learned by doing research are sanding tree core samples, tree-ring dating, and measuring the length of each tree-ring. I learned how to use a photography camera to take pictures of tree canopies in order to measure leaf angles. I also learned how to submit data entries into excel, which I didn't have any experience before.



Major: Environmental Geoscience & Geography (Spatial Analysis/GIS emphasis)

Hometown: Silver Spring, MD

Research Adviser: Dr. Brenden McNeil, Geography

- Savanah Alberts
- Shelby Boggs
- Jessica Clegg
- Roshan Daniel
- Christopher Doss
- Emily Ernest
- Evelin Flamenco
- Taylor Haggerty
- James Hartnett
- Nicole Hegele
- Ashley Leslie
- Andrew Maloney
- Sarah Michaels
- John Nowery
- Matthew Parsley
- Askar Salikhov
- Ashlee Seldomridge

Evelin Flamenco, WVU, was featured on her department's website.

West Virginia University
OFFICE OF UNDERGRADUATE RESEARCH

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What's New Summer Undergraduate Research Experience

[Home](#) / [Student Spotlights](#) / [Matthew Parsley](#)

Matthew Parsley

What advice do you have for undergraduates who are just starting out in research?

Treat it as a job. With school work, you can choose to not do it, but you're only hurting yourself. In a lab setting, others are depending on you to complete your share of responsibilities. Not only do you owe it to your lab adviser to do your part, you owe it to yourself to take advantage of and make the best of the opportunity.

When you were 10 years old, what did you want to be when you grew up?

When I was 10, I wanted to be a heart surgeon, a brain surgeon, and a preacher (simultaneously).

What are your current plans/career goals beyond the undergraduate?

Currently, I plan to attend medical school to be a pediatrician.

When did you get involved in undergraduate research?

I had my first experience with research during the fall and spring semesters of my sophomore year.

How long have you been involved in undergraduate research?

I have "officially" been in a lab since the summer between my junior and senior year.

Why did you choose get involved in undergraduate research?


My sophomore research experience was because I was trying to make myself look good. I didn't know exactly what it meant to be a researcher, but it sounded like a good résumé builder. I didn't enjoy it very much, and got away from the experience. Through the year in between, I became more interested in nutrition and happened to be looking for a summer opportunity. I decided to give research another chance, but combine it with my new, budding interest.

What is your current research?

Get FRUVED is a multistate research project that aims to create a healthier on-campus environment. The program emphasizes healthy eating, stress management, and physical activity, and is primarily geared towards college freshmen; although, upperclassmen are welcome to attend the health-themed, weekly FRUVED events. In addition to the weekly events, we conduct environmental assessments to gauge how much work each campus needs in terms of health promotion and healthy choice accessibility.

What skills have you learned by doing research that you would not have learned otherwise (i.e., from lecture alone)?

Research has given me teamwork skills that no other opportunity has ever been able to compare. It's easy to be a team player, but the real work is being able to hold yourself accountable. If you make a promise, you keep it. If you say you'll spend so many hours working on data, you do it. That accountability factor has really helped me to grow up, because it's more than just myself that would be affected.



Major: Exercise Physiology & Biology
Minor: Applied Environmental Microbiology & Infant and Toddler Studies
Hometown: Williamson, WV
Research Adviser: Dr. Melissa Olfert, Human Nutrition & Foods

[Savanah Alberts](#)
[Shelby Boggs](#)
[Jessica Clegg](#)
[Roshan Daniel](#)
[Christopher Doss](#)
[Emily Ernest](#)
[Evelin Flamenco](#)
[Taylor Haggerty](#)
[James Hartnett](#)
[Nicole Hegele](#)
[Ashley Leslie](#)
[Andrew Maloney](#)
[Sarah Michaels](#)
[John Nowery](#)
→ [Matthew Parsley](#)
[Askar Salikhov](#)
[Ashlee Seldomridge](#)

Matthew Parsley, WVU, was featured on his department's website.

Centre College students win awards at the Kentucky Academy of Science 2015 Annual Meeting

Four Centre College students recently won awards at the Kentucky Academy of Science's 2015 Annual Meeting, earning first, second and third places.

More than 800 scientists and students attended the meeting on Nov. 13 and 14 at Northern Kentucky University. Centre students who won competitions for undergraduate research oral presentations or research posters include (pictured l to r): **Kaylind Batey '17** (first place in **Science Education, oral presentation**), Ashley Merkin '16 (second place in Psychology, oral presentation), **Taylor Walker-Smith '18** and Kaylyn Berg '17 (**second place in Psychology, joint poster**), and Sangyi Hu '16 and Kunhan Tang '17 (third place in Psychology, joint oral presentation).



“The behavioral neuroscience and psychology programs are committed to providing outstanding academic and research training,” Assistant Professor of Psychology Aaron Godlaski said. “It is a welcome validation to see the hard work of our students and their supervisors recognized for their efforts.”

Faculty, staff and students of Centre College may become members of the Kentucky Academy of Science, a nonprofit organization whose mission is to foster scientific discovery and understanding in Kentucky, at www.kyscience.org.

by Elise L. Murrell

December 10, 2015

Kaylind Batey and Taylor Walker-Smith, Centre, were featured in a news release.

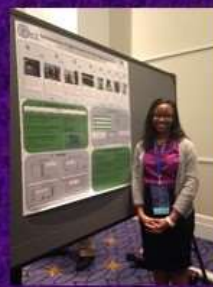
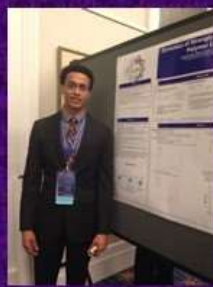


LSAMP

(Louis Stokes Alliance for Minority Participation)



25th Anniversary Research Symposium
Gaylord National Convention Center
February 22-24, 2016



Four KY-LSAMP Scholars presented at the LSAMP 25th Anniversary Research Symposium.

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