BUILDING A DIVERSE STEM TALENT POOL: CLASSROOMS TO CAREERS

Indianapolis, Indiana
October 25-27, 2019
LSMRCE 2019 Annual Conference

Co-hosts:
Louis Stokes Midwest Regional Center of Excellence & Indiana STEM LSAMP

BUILDING A COMMUNITY OF SCHOLARS | LEVERAGING NETWORKS | MENTORING FUTURE LEADERS | RESEARCH IN STEM EDUCATION
Join higher education faculty, administrators, and staff across the nation who are leading efforts to increase participation of underrepresented minority students receiving STEM degrees.

The conference includes keynote presenters sharing success stories, faculty seminars, interactive workshops for undergraduate students preparing for a future STEM career or graduate program, and networking opportunities with partners in our community. Both undergraduate and graduate research will be presented.

**TABLE OF CONTENTS**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Welcome Letter</td>
<td>1</td>
</tr>
<tr>
<td>Pre-conference Schedule</td>
<td>2</td>
</tr>
<tr>
<td>Conference Schedule</td>
<td>3</td>
</tr>
<tr>
<td>Keynote Speaker Bios</td>
<td>4</td>
</tr>
<tr>
<td>Voices of Success Panel Bios</td>
<td>6</td>
</tr>
<tr>
<td>Student Research Mentor Panel Bios</td>
<td>8</td>
</tr>
<tr>
<td>Breakout Session 1 Schedule</td>
<td>10</td>
</tr>
<tr>
<td>Bridge to the Doctorate Oral Presentations</td>
<td>11</td>
</tr>
<tr>
<td>Breakout Session 2 Schedule</td>
<td>12</td>
</tr>
<tr>
<td>Breakout Session 3 Schedule</td>
<td>13</td>
</tr>
<tr>
<td>Breakout Session 1 Abstracts</td>
<td>14</td>
</tr>
<tr>
<td>Breakout Session 2 Abstracts</td>
<td>17</td>
</tr>
<tr>
<td>Breakout Session 3 Abstracts</td>
<td>20</td>
</tr>
<tr>
<td>Bridge to the Doctorate Abstracts</td>
<td>23</td>
</tr>
<tr>
<td>Student Conference Experience</td>
<td>27</td>
</tr>
<tr>
<td>Acknowledgments</td>
<td>28</td>
</tr>
<tr>
<td>Hotel Information</td>
<td>28</td>
</tr>
</tbody>
</table>
October 25, 2019

Dear Conference Attendees,

On behalf of the Louis Stokes Midwest Regional Center of Excellence (LSMRCE) leadership team, consisting of individuals from IUPUI, Chicago State University, Ohio State University, and Fermilab, I welcome you to Indianapolis and the LSMRCE Conference. This conference, co-sponsored by LSMRCE and the Indiana STEM LSAMP, is supported by the National Science Foundation (NSF). It spotlights the shared vision of NSF and IUPUI for diversity and inclusion across the science, technology, engineering, and mathematics disciplines.

LSMRCE aims to foster the regional connections between and among six LSAMP alliances, 16 non-LSAMP institutions in the Midwest, and six Louis Stokes Regional Centers of Excellence that contribute to building a community of practice that broadens science participation. We annually offer a platform for discussions about strengthening pathways that lead to increased participation and success of underrepresented minority groups in STEM. This year’s conference theme—Building a Diverse STEM Talent Pool: Classrooms to Careers—aligns perfectly with our center’s mission and its commitment to expanding the talent pool of URM students.

Our programming activities and invited speakers will bring you insightful knowledge and innovative ideas for promoting effective practices in student recruitment, retention, and research-based mentoring. We encourage you to listen, share, learn, and help build communities of scholars who contribute to greater diversity in STEM workforces.

For participating students, this conference presents a unique opportunity for you to interact with STEM professionals and peers from other colleges and universities who share your aspirations for advancement in the STEM disciplines.

With gratitude, we thank the National Science Foundation directors for their unwavering support to the center. We congratulate the speakers, panelists, and student presenters who have led the upward trends of talent diversification. Have a great conference and welcome to Indianapolis.

Sincerely,

Kim S. Nguyen
Principal Investigator—Collaborative Site at IUPUI
**BUILDING A DIVERSE STEM TALENT POOL:**
October 25-27, 2019
Sheraton Indianapolis Hotel at Keystone Crossing

**PRE-CONFERENCE SCHEDULE**

**FRIDAY, OCTOBER 25**

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 AM</td>
<td>Check-in Table Opens</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td>11 AM-4:45 PM</td>
<td>LSAMP Alliance Management: Scaling Out Best Practices</td>
<td>Suite D &amp; E</td>
</tr>
<tr>
<td>3:30-4:30 PM</td>
<td>Student Workshop: <em>PhD! Why not me?</em></td>
<td>Suite 6 &amp; 7</td>
</tr>
<tr>
<td>4:30-5:30 PM</td>
<td>LSMRCE Annual Partner Meeting (by invitation)</td>
<td>Suite 3 &amp; 4</td>
</tr>
<tr>
<td>5-6 PM</td>
<td>LSAMP Program Poster Sessions</td>
<td>Clearwater Hallway</td>
</tr>
<tr>
<td>6-8 PM</td>
<td>Welcome Reception and Networking Session</td>
<td>Clearwater Ballroom</td>
</tr>
<tr>
<td>7-8 PM</td>
<td>LSAMP Program Reception (by invitation)</td>
<td>Crosspoint Suite</td>
</tr>
<tr>
<td></td>
<td>Dinner on Your Own</td>
<td></td>
</tr>
</tbody>
</table>

**PhD! WHY NOT ME?**

Cammi Valdez, PhD | Director, Ronald E. McNair Postbaccalaureate Achievement Program and Visiting Lecturer in Biological Sciences | Wellesley College

This undergraduate student workshop demystifies the process of and preparation for graduate school. Students are guided through three phases of the graduate application.

**GETTING STARTED**
- Why graduate school?
- Identifying programs of interest
- Getting organized

**APPLICATION PROCESS TIMELINE**

**APPLICATION COMPONENTS**
- Online application form
- Official transcripts
- Letters of recommendation
- Personal statement
- GRE scores

Participants engage in dyad and small group conversations, and through an artistic “mapping your education” activity and handouts, they will develop a framework for their personal statements. Students will receive resources to assist them when they return to campus.
## CONFFERENCE SCHEDULE

All times are EDT.

### SATURDAY, OCTOBER 26

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>6:45-8 AM</td>
<td>Continental Breakfast Buffet</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td>7 AM</td>
<td>Registration Table Opens</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td>8-8:10 AM</td>
<td>Welcome and Opening Remarks</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>8:10-8:30 AM</td>
<td>A Message from the NSF</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>8:30-9:15 AM</td>
<td>Opening Keynote</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>9:15-9:30 AM</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>9:30-11:30 AM</td>
<td>Student Poster Session</td>
<td>Clearwater Ballroom</td>
</tr>
<tr>
<td></td>
<td>Even-numbered Posters 9:30-10:30 AM</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Odd-numbered Posters 10:30-11:30 AM</td>
<td></td>
</tr>
<tr>
<td>11:30-11:45 AM</td>
<td>Break</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td>11:45 AM-12:15 PM</td>
<td>Lunch Buffet</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td>12-1:15 PM</td>
<td>Luncheon Keynote</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>1:15-2:15 PM</td>
<td>Voices of Success Panel</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>2:15-2:30 PM</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>2:30-4 PM</td>
<td>Breakout Session 1 (all attendees)</td>
<td>See page 10</td>
</tr>
<tr>
<td></td>
<td>Bridge to the Doctorate Oral Presentations</td>
<td>Suite 9 &amp; 10</td>
</tr>
<tr>
<td>4-5:30 PM</td>
<td>Resource Fair</td>
<td>Clearwater Hallway</td>
</tr>
<tr>
<td>4:30-6 PM</td>
<td>Breakout Session 2 (for professionals)</td>
<td>See page 12</td>
</tr>
<tr>
<td></td>
<td>Professional Headshots (all attendees)</td>
<td>Clearwater Hallway</td>
</tr>
<tr>
<td>5:30-7 PM</td>
<td>Fast Track to Six Figures (for graduate students)</td>
<td>Plaza Board Room</td>
</tr>
<tr>
<td></td>
<td>Dinner on Your Own</td>
<td></td>
</tr>
</tbody>
</table>

### SUNDAY, OCTOBER 27

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>7-8:30 AM</td>
<td>Continental Breakfast Buffet</td>
<td>Plaza Hallway</td>
</tr>
<tr>
<td></td>
<td><strong>Check out of your room; hotel will hold bags.</strong></td>
<td>Lobby</td>
</tr>
<tr>
<td>8-9 AM</td>
<td>Mentoring Today’s Students in Research Panel</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>9-9:15 AM</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>9:15-11:15 AM</td>
<td>Breakout Session 3 (all attendees)</td>
<td>See page 13</td>
</tr>
<tr>
<td>11:15-11:25 AM</td>
<td>Break</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>11:25-11:50 AM</td>
<td>Awards Ceremony</td>
<td>Plaza Ballroom</td>
</tr>
<tr>
<td>11:50 AM-12 PM</td>
<td>Closing Remarks</td>
<td>Plaza Ballroom</td>
</tr>
</tbody>
</table>

The conference program is available on the LSRMRE conference webpage.
lsrmrc.org/conference/annual/annual-2019.aspx

**Program Changes and Cancellations**
The conference sponsors reserve the right to make changes in programs and speakers. Changes and cancellations will be posted at the registration desk.

**Conference Reference**
In more than 25 years with NASA, Aprille Joy Ericsson, PhD, has held numerous positions. In 2017, Dr. Ericsson assumed the position of New Business Lead for the NASA Goddard Space Flight Center (GSFC) Instrument Systems and Technology Division. Just prior to that position, she served as the Capture Manager for a proposed astrophysics mid-sized class explorer, called STAR-X. Prior to that proposal development, Dr. Ericsson served as the NASA GSFC Program Manager for SBIR/STTR in the Innovative Technology Partnerships Office. This SBA-funded program enables small businesses and small businesses collaborating with universities, respectively, to compete for opportunities to solve selected R&D challenges faced by various government agencies in the U.S. Formerly, she served as the Deputy to the Chief Technologist for the Engineering and Technology Directorate with a focus on cubesat and smallsat mission development. She has also served at NASA HQs as a Program Executive (PE) for Earth Science and a Business Executive for Space Science.

She has served as an adjunct faculty member at several universities. Currently, Dr. Ericsson sits on academic boards at the National Academies and MIT. She also served as a trustee at Howard University, where she is lead advisor for the DMV NSBE Jr. Chapter and advisory board chair of the Department of Mechanical Engineering.

Dr. Ericsson received her BS in aeronautical/astronautical engineering from MIT. She received her Master of Engineering and PhD in mechanical engineering at Howard with an aerospace option. Her graduate school research at Howard was developing control methods for orbiting large space platforms like ISS.

Dr. Ericsson has been honored with numerous awards. Some of the most prestigious are the 2016 Washington Award from the Western Society of Engineers and Distinguished Alumnus from Tau Beta Pi, the Engineering Honor Society. She is proud to be the first African-American female to receive a PhD in mechanical engineering from Howard University.
Dr. Jessica Esquivel, PhD, is a Postdoctoral Research Associate at Fermi National Accelerator Laboratory. Fermilab explores the universe at the smallest and largest scales in order to study the fundamental particles and forces that govern the universe. Currently, Dr. Esquivel is working on the Muon $g$-2 experiment studying the electron’s heavier sibling, the muon. She is one of fewer than approximately 150 Black women in the U.S. with a PhD in physics in the U.S. and the second Black woman to graduate with that degree from Syracuse University. Dr. Esquivel has experience navigating spaces where she is “the first” or “the only.”

Her graduate research focused on the study of ghostly particles called neutrinos interacting in the MicroBooNE Experiment using innovative machine learning techniques like those used in facial recognition software. She received her bachelor’s degree in electrical engineering and applied physics from St. Mary’s University in San Antonio, TX.

Dr. Esquivel identifies as a female, a Black, an Afrolatinx, a lesbian, a physicist, and a Texan. She is an advocate for increasing diversity in physics and focuses on the intersections of race, gender, and sexuality in her outreach efforts. She has been recognized by the Fermilab Friends for Science Education Organization for the exceptional contributions she’s made to Fermilab’s K-12 education and outreach programs. Also, she was featured in Adler Planetarium’s Chicago Black Women in STEM series and was interviewed by Lean In: Women of Color for Black Women’s Equal Pay Day discussing the gender wage gap for black women.

Her most recent accomplishment is organizing the participation and sponsorship of Fermilab at Wakandacon, a three-day Afro-futuristic convention that strives to create a safe space for the Black community to explore their interests from comic culture to STEM. She also was named the American Association for the Advancement of the Sciences IF/THEN Ambassador, a program that looks to inspire middle school girls to become the next generation of STEM pioneers.

---

**LUNCHEON KEYNOTE**

**SATURDAY, 12-1:15 PM, PLAZA BALLROOM**

**JESSICA ESQUIVEL, PhD**

*Postdoctoral Research Associate, Fermilab*

@DrEsquivelPhD  
/Fesquivel.Jessica

**LIFE AS A PHYSICIST: THE LIMINAL SPACE WHERE PHYSICS AND LIFE COLLIDE**

Dr. Esquivel will discuss the trials and tribulations to achieving her PhD, attaining a position at Fermilab, and the importance of making STEM accessible for underrepresented minorities. She will draw parallels between a subatomic particle’s path towards discovery and her path being a Black, LatinX, lesbian woman in a white, male-dominated field.

#BlackandSTEM #LatinaPhysicist  
#LatinXinSTEM #AfroLatinXinSTEM  
#OutinSTEM#LGBTinSTEM #WomenInSTEM  
#IAMAPhysicist #ThisIsWhatAScientistLooksLike  
#ThisIsWhatAPhysicistLooksLike  
#RepresentationMatters
VOICES OF SUCCESS PANEL
SATURDAY, 1:15-2:15 PM, PLAZA BALLROOM

PAMELLA SHAW, DMD, MPH
Assistant Dean for Admissions; Assistant Professor-Clinical | Ohio State University College of Dentistry
LSMRCE Student Mentor Lead

Pamella Shaw is the Assistant Dean for Admissions at The Ohio State University College of Dentistry. She previously served as Associate Dean for Diversity, Equity, and Inclusion at Indiana University School of Dentistry. This important leadership role includes development of programs and activities to help increase the recruitment and retention of underrepresented minority students, faculty, and staff. She previously served as an Assistant Provost at Purdue University, where she directed and managed two multi-campus alliances supported by the National Science Foundation Broadening Participation initiative. The Louis Stokes Alliance for Minority Participation Indiana and the Midwest Crossroads Alliance for Graduate Education and the Professoriate target underrepresented minority students in science, technology, engineering, and mathematics disciplines.

JOSHUA M. AMES
Doctoral Candidate and NSF GRFP Fellow | University of Illinois at Chicago
LSAMP Bridge to the Doctorate Alumnus

Joshua Ames is a doctoral candidate in the Department of Microbiology and Immunology at the University of Illinois at Chicago. He is highly involved in graduate student governance, having served as a Graduate Student Council representative and as president for the Graduate Education in Medical Sciences Student Association. His work focuses on acute ocular infections caused by HSV-1, leading to papers in the Journal of Virology, Science Translational Medicine, and Science Advances. He is a National Science Foundation Graduate Research Fellowship Program fellow and has received funding from the LSAMP Bridge to the Doctorate Program and the Illinois Society for the Prevention of Blindness. Upon graduation, Mr. Ames wants to continue high impact research as a world expert in his field.

DEISY CRISTINA CARVALHO FERNANDES
Doctoral Candidate | University of Illinois Chicago
LSAMP Bridge to the Doctorate Alumna

Deisy Fernandes is a fifth-year PhD student in chemical engineering at the University of Illinois at Chicago (UIC). She started her undergraduate studies in Brazil at the University of Sao Paulo and finished her BS in chemical engineering at UIC. She had numerous research experiences as an undergraduate at both universities. She was part of The Passage Program, where she became familiar with graduate studies. Ms. Fernandes received the Bridge to the Doctorate for her first two years of graduate school. In her first year, she was awarded the Graduate Research Fellowship from NSF. Later, she received the NSF GROW Fellowship, allowing her to conduct research for her PhD thesis in France at the University of Bordeaux. This work led to an article for publication, which is her second published article.
CESAR ARTURO GARCIA  
*PhD Student | University of Virginia*

Cesar Arturo Garcia was selected as an IN LSAMP Scholar in 2017 while he was an undergraduate working with Zoran Kilibarda, PhD, at Indiana University Northwest (IUN), where he researched the amounts of microplastics found along the southern shores of Lake Michigan. During his time at IUN, Mr. Garcia also assisted students in geoscience courses. He is a University of Virginia (UVA)-North Carolina LSAMP Bridge to Doctorate Scholar, pursuing a doctorate in UVA’s Department of Environmental Sciences, where he is a member of the Lauren Simkins, PhD, Ice and Ocean Group. His project focuses on the distribution and characteristics of marine plastics in the Southern Ocean by looking at seafloor sediments, sediment-trap samples, and surface ocean organisms. Mr. Garcia holds a BS in geology and a BA in Spanish, both from Indiana University.

ADOLFO I. ALVARADO RIVERA  
*Student Engineer | NASA Kennedy Space Center  
Undergraduate Student | University of Central Florida  
CFSA LSAMP Scholar*

Adolfo Alvarado Rivera is pursuing an undergraduate degree in mechanical engineering with a minor in physics at the University of Central Florida. He received his associate degree in engineering from Valencia College in Orlando, FL, where he first conducted research as an LSAMP Scholar in a physics education assistantship. The summer following his assistantship, Mr. Rivera was accepted to the Research Experience for Undergraduates (REU) program at the IUPUI Integrated Nano-Systems Development Institute. Following the REU, he became a Pathways Intern at NASA Kennedy Space Center, where he worked for the Launch Services Program as part of the Flight Structures Branch.

CAMMI VALDEZ, PhD  
*Director, McNair Scholars Program; Faculty in Biological Sciences | Wellesley College  
OK-LSAMP Scholar | Southwestern Oklahoma State University*

Cammi Valdez, PhD, is the inaugural Director of the Ronald E. McNair Postbacalaureate Achievement Program at Wellesley College, which provides academic and professional support to first-generation students, low-income students, and students of color on their paths to STEM graduate education. Her research focuses on understanding the pathology and physiology of vascular diseases present in the eye using mouse models. Through her teaching, Dr. Valdez aims to inspire students to explore and pursue STEM. She teaches a first-year seminar called “The Eye: A Window into Vascular Diseases” and co-teaches an advanced writing seminar on applying to graduate school. Dr. Valdez received a BS Professional in chemistry and a BS in mathematics from Southwestern Oklahoma State University, where she was an OK-LSAMP Scholar. During her time in LSAMP, she received critical funding that allowed her to focus on research without holding jobs on or off campus. Additionally, LSAMP provided Dr. Valdez the opportunity to present her research at two local and two national conferences. Through these opportunities to conduct and present research, Dr. Valdez confidently decided to pursue graduate school, where she earned her PhD in biological chemistry and molecular pharmacology from Harvard University.
EDA DAVIS-LOWE
Assistant Vice President, Educational Partnerships | Valencia College
Central Florida STEM Alliance

Eda Davis-Lowe is Assistant Vice President, Educational Partnerships at Valencia College and serves as Co-PI/Alliance Director of the Central Florida STEM Alliance. She has long been involved in efforts to increase the diversity of students interested in and actively pursuing higher education degrees with concentrated efforts and accomplishments in STEM education and careers. She served for more than 11 years at Oregon State University as Director of the Science & Math Investigative Learning Experiences Program, a statewide initiative providing academic, social, and career support for historically underrepresented minority, low-income, and other educationally underserved students. As a collaborator, Dr. Davis-Lowe participates in, and often has led, efforts to enhance system capacity and establish cross-sector partnerships to increase in STEM teaching and learning in formal and out-of-school settings. She uses her personal experiences to fuel advocacy for multi-tiered mentoring as a critical practice to support individuals pursuing STEM degrees and careers.

NATHAN ALVES, PhD
Assistant Professor of Emergency Medicine | Indiana University School of Medicine
IN LSAMP Mentor

Nathan Alves completed his PhD in chemical and biomolecular engineering at the University of Notre Dame in 2013. He is an Assistant Professor in the Department of Emergency Medicine at the Indiana University School of Medicine, making him the first and only non-physician, tenure-track faculty member of approximately 90 clinical faculty members in the department. Dr. Alves takes a unique translational research approach that spans science and medicine, and he serves as a mentor across many programs, including IN-LSAMP. He is CEO and co-founder of Indiana Lysis Technologies, LLC, a startup company developing safer clot digesting therapeutics using nanotechnology.
BENJAMIN C. FLORES, PhD
Associate Dean for Academic Affairs and Undergraduate Studies; Professor of Electrical and Computer Engineering | University of Texas El Paso
Texas Systems LSAMP PI

LinkedIn /in/benjamin-flores-2b91934

Benjamin C. Flores, PhD, joined the faculty of the University of Texas at El Paso in 1990 after receiving his PhD in electrical engineering from Arizona State University. He is a Professor of Electrical and Computer Engineering and has held a number of administrative positions. Dr. Flores is an expert in retention strategies for non-traditional undergraduate and graduate students in STEM disciplines. He is the Principal Investigator and Director of the University of Texas System Louis Stokes Alliance for Minority Participation. Dr. Flores was recognized by President Barak Obama with the Presidential Award for Excellence in Science, Mathematics, and Engineering Mentorship (2010) for his efforts to increase the enrollment, retention, and graduation of Latinos and Latinas in STEM.

MARY KONKLE, PhD
Assistant Professor of Chemistry | Ball State University
IN LSAMP Mentor

@mechem
#ChemCUR

Mary Konkle, PhD, is an alumna of and Assistant Professor of Chemistry at Ball State University. She received her PhD from Vanderbilt University in 2008, and during the 10 years of her professional career, she has mentored more than 28 collegiate students (including three IN LSAMP students) at Ball State University and Eastern Illinois University.

JIM SWARTZ, PhD
Dack Professor of Chemistry; Director, Center for the Science in the Liberal Arts | Grinnell College
IINSPIRE LSAMP

Jim Swartz, PhD, started his education at a community college in California and now is the Dack Professor of Chemistry and Director of the Center for Science in the Liberal Arts at Grinnell College. While science division chair, Dr. Swartz lead efforts to improve STEM success among underrepresented students by reforming teaching in introductory science, expanding undergraduate research, and improving science facilities. He was a leader to plan the Grinnell Science Project, a major effort to improve the success in science among underrepresented students, which received a Presidential Award for Excellence in Science, Mathematics, and Engineering Mentoring in 2011. While Dean of the college (1998-2008), he helped to expand programs for scholarly leaves, student-faculty research, and faculty diversity. Dr. Swartz has consulted with over 40 institutions on science curriculum and pedagogy and/or facilities, and he has been a PI or co-PI on NSF grants supporting improvements in undergraduate chemistry.
BREAKOUT SESSION 1
SATURDAY, 2:30-4 PM

THE WAY OUT: BREAKING DOWN BARRIERS IN STEM EDUCATION
Gail Coover | University of Wisconsin-Madison
Plaza Suite 2

LSAMP WORLDWIDE: HOW TO BUILD, GROW, AND MAINTAIN INTERNATIONAL UNDERGRADUATE RESEARCH WITHIN YOUR ALLIANCE
Michael Petro | University of Connecticut
Plaza Suite 4

LEVERAGING IINSPIRE-LSAMP: THE IOWA, ILLINOIS, NEBRASKA STEM PARTNERSHIP TO DEVELOP SUMMER BRIDGE PROGRAMS FOR FOSTERING STEM IDENTITY
Jim Swartz | Grinnell College
Plaza Suite 6 & 7

BEST PRACTICES IN EVALUATION OF MULTI-SITE LSAMP PROGRAMMING TO DIVERSIFY THE STEM TALENT POOL
Dorinda Gallant | Ohio State University
Plaza Suite 5

FOSTERING EQUITY AND INCLUSION AMONG UNDERREPRESENTED MINORITIES IN STEM THROUGH STEM CLUBS AND ACTIVITIES
John Fynn | Polk State College
Plaza Suite 3

BUILDING A COMMUNITY OF SCHOLARS
LEVERAGING NETWORKS
MENTORING FUTURE LEADERS
RESEARCH IN STEM EDUCATION
PROFESSIONAL DEVELOPMENT
SYNTHESIS, CHARACTERIZATION, 
AND BIOMEDICAL APPLICATION OF 
FERROCENE-HORMONE COMPLEXES
Mariola M. Flores-Rivera | University of Puerto Rico, 
Mayagüez Campus

DISTRIBUTION OF THE OSTEOPILUS 
SEPTENTRIONALIS (CUBAN TREE 
FROG) IN PUERTO RICO
Zabrina Santana-Navarro | University of Puerto 
Rico, Rio Piedras Campus

ENVIRONMENTAL AND ECONOMIC 
COMPARISON OF REUSABLE AND 
DISPOSABLE BLOOD PRESSURE CUFFS 
IN MULTIPLE SETTINGS
Sarah Sanchez | Northeastern University

GESTURE CONTROLLED VARIABLE 
STIFFNESS WRIST BRACE
Katiso Mabulu | Northeastern University

DETECTION OF ILLICIT AND 
PRESCRIPTION DRUGS DURING 
SPORTING EVENTS
Zachary Ridge | Oklahoma State University

ALUMINUM INGESTION IN HONEY 
BEES: A SUBSPECIES PERSPECTIVE OF 
EXPOSURE RISK
Ana Chicas-Mosier | Oklahoma State University

ANALYSIS OF THE INTERACTIONS 
BETWEEN CRYPTOCOCCUS 
NEOFORMANS AND PULMONARY 
MACROPHAGES
Ashlee Hawkins | Oklahoma State University
BREAKOUT SESSION 2
SATURDAY, 4:30-6 PM

HELP POSITION YOUR STUDENTS FOR SUCCESS: FROM BECOMING BETTER MENTEES TO GOING INTERNATIONAL
Eduardo Santillan-Jimenez | University of Kentucky
Plaza Suite 2

RESEARCH ON BUILDING A COMMUNITY OF UNDERREPRESENTED STEM MAJORS IN CALCULUS
David Miller | West Virginia University
Plaza Suite 4

UNCOVERING THE THRESHOLD: TAKING SOCIAL INTELLIGENCE TO THE NEXT LEVEL FOR INCREASED STUDENT SUCCESS
Tyrslai Williams | Louisiana State University A&M College
Plaza Suite 6 & 7

DEVELOPING MINDSETS FOR STEM: SOCIAL PSYCHOLOGICAL INTERVENTIONS THAT PROMOTE STUDENT SUCCESS IN STEM
Jhenai Chandler | Santa Fe College
Plaza Suite 5

SUPPORTING ACHIEVEMENT IN STEM THROUGH AN INTENTIONAL INTEGRATION OF STORYTELLING
Kasandra Holmes | Valencia College
Plaza Suite 3
BROADENING THE PARTICIPATION OF UNDERREPRESENTED MINORITIES IN THE MATHEMATICS PROGRAMS AT UT ARLINGTON
Tuncay Aktosun | University of Texas at Arlington
Plaza Suite 4

INTERNATIONAL COLLABORATIVE RESEARCH IN STEM
Denise Yates | University of Illinois Chicago
Plaza Suite 3

ACCELERATE YOUR PROFESSIONAL WRITING: USING RESOURCES TO DELIVER A QUALITY LITERATURE REVIEW IN LESS TIME
Sean Stone | Indiana University
Plaza Suite 9 & 10

BEYOND RETENTION TO DEGREE: CULTURALLY RESPONSIVE APPROACHES TO SUPPORT STUDENTS OF COLOR IN STEM PATHWAYS
Juanita Jasso Hinojosa | University of Nevada, Las Vegas
Plaza Suite 6 & 7

THE SCUBA PROGRAM: A POSSIBLE TEMPLATE FOR INTERNATIONAL UNDERGRADUATE RESEARCH EXPERIENCES
Thomas Ready | Midland College
Plaza Suite 5

IUPUI’S MULTICULTURAL LEADERSHIP EMPOWERMENT PROGRAM
Anneka Scott and Katherine Shr | IUPUI
Plaza Ballroom D & E

IUPUI’S MULTICULTURAL LEADERSHIP EMPOWERMENT PROGRAM
Dennis Rudnick | IUPUI
Plaza Suite 2
THE WAY OUT: BREAKING DOWN BARRIERS IN STEM EDUCATION

**Presenter:** Gail Coover, PhD | University of Wisconsin-Madison

**Co-Author:** Anique Ruiz | University of Wisconsin-Milwaukee

**ABSTRACT**

In this session, faculty and staff will discuss how underrepresented minority STEM students, often the first in their families to attend college in a STEM discipline, learn the most from their mentors and leaders when they share their own stories of overcoming adversity and giving back. This will be an open, sharing circle-style breakout session facilitated by WiscAMP Executive Director Gail Coover, PhD, and STEM-Inspire Program Director Anique Ruiz. They will use threshold concepts to find the “language of connection” between mentors, staff, and URM STEM scholars. In addition to learning from colleagues and sharing best practices, participants will walk away with materials and resources on the “language of connection” to continue learning, sharing, and practicing cross-cultural communication skills beyond the conference.

LSAMP WORLDWIDE: HOW TO BUILD, GROW, AND MAINTAIN INTERNATIONAL UNDERGRADUATE RESEARCH WITHIN YOUR ALLIANCE

**Presenter:** Michael Petro, JD, MS | University of Connecticut

**ABSTRACT**

This breakout session will explore three years of international experiences from the Northeast Louis Stokes Alliance for Minority Participation. For two consecutive summers, student cohorts lived, researched, and experienced the culture of Shanghai, China, and a third cohort completed a similar experience in Sydney, Australia during the summer 2019.

The session will discuss the component pieces of an international research experience. Beyond the basics, participants will learn about and discuss the challenges, rewards, and logistics of executing such a program. The session will also offer concrete ideas on how to leverage existing structures at universities while building, growing, and maintaining a consistent international opportunity.

The session will include key learnings from the creation, administration, and execution of these programs. It will also foster a facilitated discussion on other approaches, best practices, challenges, successes, and mixed results in completing cohort-based international research for a breadth of STEM disciplines. Participants will leave with a strong overview on how to add or enhance international experiences within their own alliance structures.
LEVERAGING IINSPIRE-LSAMP: THE IOWA, ILLINOIS, NEBRASKA STEM PARTNERSHIP TO DEVELOP SUMMER BRIDGE PROGRAMS FOR FOSTERING STEM IDENTITY

**Presenter:** Jim Swartz, PhD | Grinnell College  
**Co-Authors:**  
Sharmin Sikich | Doane University  
Angela McKinney | Nebraska Wesleyan University  
LeAnn Faidley | Wartburg College  
Derrick Rollins | Iowa State University  
Carmen Jones | Iowa State University  
Cailin Huyck Orr | Carleton College

**ABSTRACT**

An early priority of the IINSPIRE-LSAMP alliance was to establish a campus-based summer bridge or pre-orientation program to provide grounding for students transitioning to a four-year campus. Our goal was to leverage the strength of the alliance to showcase what works at other alliance institutions and to design new programs.

We started this effort by offering a half-day workshop at the alliance’s first annual conference. Programs from Iowa State University and Grinnell College were presented, and the attendees were given access to an online, curated collection of supporting materials. That workshop was followed by a day-long workshop during which campus groups worked together and shared draft plans to implement a summer bridge program on their own campuses.

After these programs had run for several years, descriptions and materials were added to the IINSPIRE online showcase of summer bridge programs and are publicly available at https://serc.carleton.edu/lsamp/bridging.html. This growing collection is an example of how an alliance can assist member campuses to do things that would have been difficult or impossible without the alliance.

BEST PRACTICES IN EVALUATION OF MULTI-SITE LSAMP PROGRAMMING TO DIVERSIFY THE STEM TALENT POOL

**Presenter:** Dorinda Gallant, PhD | Ohio State University  
**Co-Author:** Anna C. Brady | Ohio State University

**ABSTRACT**

In this roundtable, we will facilitate an in-depth discussion on the best practices for multi-site evaluations of program implementation and assessing outcomes across LSAMP alliance partner institutions. The goal of the roundtable discussion is to understand best practices from alliances for both evaluation and analysis of LSAMP programming and student data. We will provide a mix of empirical evidence and our own experiences working within an alliance, and we will facilitate interaction and in-depth discussion among attendees. Questions we will consider include (a) differences across institutions, (b) selection and integration of valid and reliable quantitative and qualitative measures, (c) timing of data collection, and (d) how to increase student and faculty survey participation.
FOSTERING EQUITY AND INCLUSION AMONG UNDERREPRESENTED MINORITIES IN STEM THROUGH STEM CLUBS AND ACTIVITIES

Presenter: John Fynn, MBA | Polk State College
Co-Authors: Kassy Holmes | Valencia College
Lawrence Young | Polk State College

ABSTRACT

Building a sense of community among students and STEM faculty through STEM clubs and activities motivates and supports the level of student engagement that enhances the educational experience for students. This session is intended to promote the creation and benefits of a thriving STEM club on campus. Session goals:

• To promote the importance of student participation and peer engagement on campus and virtually for nontraditional URMs.
• To boost student confidence and create a community of belonging through the development and implementation of a successful STEM club.

The session will ask attendees to share experiences of non-inclusion and lack of belonging to highlight the challenges URMs face. The Central Florida STEM Alliance will highlight the success of its strong STEM clubs at Polk State College and Valencia College through students’ testimonials, video clips, pictures, and storytelling. Participants will design a STEM club implementation plan customized to their institutions’ demographics.
HELP POSITION YOUR STUDENTS FOR SUCCESS: FROM BECOMING BETTER MENTEES TO GOING INTERNATIONAL

Presenter: Eduardo Santillan-Jimenez, PhD | University of Kentucky
Co-Author: Fara Williams | KY-WV LSAMP

ABSTRACT
The main goal of the session is to provide attendees with proven resources that help students complete studies in STEM disciplines and launch successful careers in STEM fields. A range of tools and actions will be discussed, including individual development plans, developmental network maps, mentoring contracts and training, and ways to access research experiences and international opportunities.
RESEARCH ON BUILDING A COMMUNITY OF UNDERREPRESENTED STEM MAJORS IN CALCULUS

**Presenter:** David Miller, PhD | West Virginia University

**Co-Author:** Edgar Fuller | Florida International University

**ABSTRACT**

In 2009, West Virginia University adapted the Emerging Scholars Program (ESP) to infuse group- and inquiry-based learning into a Calculus I class. Students were given worksheets that focused on both conceptual- and procedural-driven problems and worked in small groups to solve these problems. Periodically throughout each class, groups also gave presentations to reinforce the material and to ensure students had a good understanding of the material. Due to student demand, the Emerging Scholars Program was expanded to Calculus II in 2010 and to Calculus III and Differential Equations in 2013.

In this breakout session, we will present a brief background of the Emerging Scholars Program and an overview of the curriculum and class structure. This will be followed by a presentation of descriptive statistics on students’ success rates in the four ESP courses (Calculus I, II, III and Differential Equations) and statistical analysis comparing ESP students to the majority population.

UNCOVERING THE THRESHOLD: TAKING SOCIAL INTELLIGENCE TO THE NEXT LEVEL FOR INCREASED STUDENT SUCCESS

**Presenter:** Tyrsllai Williams, PhD | Louisiana State University A&M College

**ABSTRACT**

The engagement of students in “communities” on campus and within their specific fields can serve as the catalyst for an increase in student success. This can be done by meeting students where they are academically and professionally. One way to determine a student’s current perspective for learning and engaging is by looking at the threshold concepts that tend to limit their success.

This session will explore specific thresholds that are most common in LSAMP scholars, fine-tune the lens in which students’ successes and failures are viewed, develop methods to aid students in moving from one threshold to the next, advance strategies to increase opportunities for engagement, and support efforts to connect with students, including those traditionally excluded from typical educational settings.

After attending this session, participants should be able to: (a) distinguish key threshold concepts through typical advising or mentoring sessions, (b) aid the student’s development of professional and academic skills that are necessary to support the journey through threshold concepts, (c) develop programming to ensure proper threshold skill development, (d) conduct an assessment of their existing structure and systems, and (e) describe effective ways of strengthening their own practices.
DEVELOPING MINDSETS FOR STEM: SOCIAL PSYCHOLOGICAL INTERVENTIONS THAT PROMOTE STUDENT SUCCESS IN STEM

Presenter: Jhenai Chandler, MS | Santa Fe College

ABSTRACT

Environments that provide effective feedback, a sense of intellectual safety, belongingness, and a growth mindset prove to promote persistence among underrepresented minority students, as well as create a sustainable diverse STEM pipeline. The Florida-Caribbean Louis Stokes Regional Center of Excellence is a practitioner-researcher collaboration that designs and disseminates interventions and effective feedback strategies that address psychosocial barriers that contest student persistence in STEM degree programs.

This session will provide participants an overview of social psychological theory and interventions that create academic environments where underrepresented minority students can thrive and persist. It also addresses outcomes from the first annual Mindset for STEM Faculty Development Institute.

SUPPORTING ACHIEVEMENT IN STEM THROUGH AN INTENTIONAL INTEGRATION OF STORYTELLING

Presenter: Kasandra Holmes | Valencia College

ABSTRACT

This presentation will showcase efforts of the Central Florida STEM Alliance (CFSA) to support student achievement in STEM through integrated storytelling. Examples presented will draw from multiple perspectives and demonstrate how integrating opportunities for participants to embrace and present STEM stories can be an effective teaching and student engagement tool in a variety of settings. Formats used in CFSA programs include structured but informal conversations, keynote presentations, student-developed creative presentations, and video interviews.

Participants in this session will gain a better understanding of the dual importance of supporting students in developing critical communication skills to both i) analyze, discuss, and present STEM concepts and research and ii) tell their own STEM stories and learn from the stories of others. Participants will also explore opportunities to implement tools and methods to champion STEM storytelling at their own institutions in alignment with traditional STEM communication skill-building strategies.
BROADENING THE PARTICIPATION OF UNDERREPRESENTED MINORITIES IN THE MATHEMATICS PROGRAMS AT UT ARLINGTON

Presenter: Tuncay Aktosun, PhD | University of Texas at Arlington

ABSTRACT

We report on our S-STEM mentoring and scholarship program in mathematics supported by the NSF-DUE since 2008. We use the data on our S-STEM scholars and compare it with the data on all mathematics majors.

We describe various aspects of our S-STEM program, including its effect on:

- Increased enrollment of women, underrepresented minorities, and underserved students.
- Involvement of our undergraduate mathematics majors on various academic activities, including leadership, peer mentoring, and undergraduate research.
- Impact on the student success of student chapters of several mathematics organizations.
- The transition to careers after the undergraduate degree or the transition to graduate studies.

We also describe the lessons learned and improvements made toward the goals of:

- Managing our resources in the optimal way to maximize the impact of our S-STEM program.
- Retaining undergraduate mathematics majors, improving academic advising, establishing various measures for timely graduation, strengthening the academic infrastructure to improve student success, and enhancing the student support system.
- Securing further external funding for our activities and student support.
- Improving ties with former students, local industry, and civic organizations.
- Collaborating with colleagues in nearby community colleges and institutions in the region, and establishing close ties with mentors, especially in institutions with many underrepresented minorities and underserved students.
- Utilizing resources related to faculty, graduate students, and undergraduate students.

INTERNATIONAL COLLABORATIVE RESEARCH IN STEM

Presenter: Denise Y. Yates, MA, NCC | University of Illinois at Chicago; LSAMP NSF International Center of Excellence

ABSTRACT

The Louis Stokes Regional NSF International Center of Excellence (LSAMP-NICE) employs a multi-pronged approach incorporating information dissemination, professional development and networking, mentorship, and support. The center encourages creativity to establish international linkages and partnerships that broaden international collaborative research.

The objective of this interactive session is to share international research and funding opportunities and to offer a springboard for continued discussion and action at the attendees’ home institutions.
ACCELERATE YOUR PROFESSIONAL WRITING: USING RESOURCES TO DELIVER A QUALITY LITERATURE REVIEW IN LESS TIME

**Presenter:** Sean Stone | Indiana University  
**Co-Author:** M. Sara Lowe | IUPUI University Library

**ABSTRACT**

Searching for, accessing, evaluating, and applying information are fundamental skills for modern life. Universal and translational, they are equally applicable to daily life as well as researching in specific disciplines. With a proliferation of available information sources, one frustrating aspect of the research process is the literature search. Choosing suitable sources of information (such as the right database), evaluating the quality of items retrieved in searches, and the process of systematically developing and executing a search can be overwhelming.

This session will help researchers at all levels better understand how to determine their information need. It will also address where and how to look for sources in a variety of disciplines regardless of academic affiliation and access to subscription resources. Participants will leave the session with concrete tools and strategies to make their next literature reviews more efficient and effective.

---

IUPUI’S MULTICULTURAL LEADERSHIP EMPOWERMENT PROGRAM

**Professional Session Presenter:** Dennis Rudnick | IUPUI

**Student Session Presenters:** Anneka Scott | IUPUI  
Katherine Shr | IUPUI

**ABSTRACT**

This highly interactive workshop will introduce participants to the IUPUI Multicultural Leadership Empowerment Program (MLEP). MLEP cultivates leaders to engage in issues of diversity, equity, and inclusion—developing knowledge, awareness, skills, and strategic practices that respond to the challenges and possibilities of learning, working, and living in a diverse world.

This session aims to accomplish the following objectives.

- Shed light on the necessity and significance for multicultural leadership and empowerment for higher education students.
- Expose participants to the MLEP model, philosophy, and guiding principles.
- Engage participants in the MLEP curriculum, including several key learning activities.
THE SCUBA PROGRAM: A POSSIBLE TEMPLATE FOR INTERNATIONAL UNDERGRADUATE RESEARCH EXPERIENCES

**Presenter:** Thomas Ready | Midland College

**ABSTRACT**

Midland College has implemented an unconventional marine science effort called the Student Cohort for Undergraduate Marine Bioscience Abroad (SCUBA). SCUBA is part of the University of Texas System LSAMP-Pathways program and entails mentor-led research in the Caribbean Sea centered on the study of coral reefs. Students acquire data on-site and perform analysis either on-site or at their home institutions. The SCUBA program has structural program elements that may serve as a template for research programs at other institutions.

BEYOND RETENTION TO DEGREE: CULTURALLY RESPONSIVE APPROACHES TO SUPPORT STUDENTS OF COLOR IN STEM PATHWAYS

**Presenter:** Juanita Jasso Hinojosa, MEd | University of Nevada, Las Vegas

**Co-Authors:** Blanca Rincón, PhD | University of Nevada, Las Vegas
Erica Fernández | University of Nevada, Las Vegas

**ABSTRACT**

This session will contribute to professionals’ existing understanding of how to support students of color pursuing STEM degrees. First, we will share our preliminary findings about what informs the initial educational and career aspirations of students of color in STEM and the importance of leveraging the cultural capital that students of color possess upon entering higher education institutions. Second, we will discuss preliminary findings on the influence of familial capital (Yosso, 2005) and the development of academic family on students of color STEM pathways via programs and initiatives that foster inclusive environments, and via institutional agents and peers that are critical for students’ STEM aspirations and persistence.
SYNTHESIS, CHARACTERIZATION, AND BIOMEDICAL APPLICATION OF FERROCENE-HORMONE COMPLEXES

Presenter: Mariola M. Flores-Rivera | University of Puerto Rico, Mayagüez Campus

ABSTRACT

Approximately 52% of breast cancer cases are related to over-expression of the estrogen receptor (ERα). Conventional metal-based therapeutic drugs, such as cisplatin and its derivatives, are still used to inhibit this abnormal cellular proliferation rate. However, cisplatin-based drugs are highly cytotoxic, triggering a series of side effects that become detrimental to the body due to their lack of selectivity between healthy and cancerous tissue. In 1984, Köpf-Maier and his co-workers first reported the anticancer properties of ferrocene. This organometallic compound leads to the formation of radical oxygen species that cause oxidative damage to DNA, inducing cell apoptosis.

Our research group has successfully incorporated ferrocene with estrone and estradiol at estrogen’s rings A and D showing cytotoxic activity on hormone dependent and hormone independent breast cancer cell lines. The ferrocene-hormone complex substituted at estrogen’s ring A proved to have cytotoxic activity similar to conventional therapeutic agents, such as cisplatin and tamoxifen, and dockings studies showed effective interaction. This work seeks to deliver a new approach to enhance the selectivity to effectively target hormone dependent cancers, specifically, ER+ breast cancer. We present a series of novel ferrocene-hormone complexes with its characterization by X-Ray Diffraction (XRD). Computational studies of the interaction of the ferrocene-hormone complexes with ERα protein were performed which demonstrated the possibilities of docking interaction of these drugs in the ligand binding pocket of the ERα.

This project is funded by National Science Foundation Bridge to Doctorate award HRD-1400868. The Single Crystal X-ray Diffraction Instrument was acquired through the support of the National Science Foundation under the Major Research Instrumentation Award Number CHE-1626103.

DISTRIBUTION OF THE OSTEOPILUS SEPTENTRIONALIS (CUBAN TREE FROG) IN PUERTO RICO

Presenter: Zabrina Santana-Navarro | University of Puerto Rico, Rio Piedras Campus

ABSTRACT

The Osteopilus septentrionalis (Cuban Tree Frog) is native to Cuba, the Bahamas, and the Cayman Islands. It has been introduced in different countries such as Puerto Rico. There are very few studies of this species on the island, and it could be affecting the native fauna. It is necessary to know about the distribution to establish management plans.

Social media groups and websites on herpetofauna were revised with 10+ keywords. There were 474 observations obtained. The observations were evaluated by publication dates, the municipality where it was sighted, and if it was confused by a native frog. The observations, processed in Microsoft Excel, were obtained from 47 municipalities in Puerto Rico. Those with greater data were Arecibo (10%), Isabela (7%), Vega Baja (7%), and San Juan (5%). These municipalities are karstic, which resembles the frog habitat. Some have ports where merchandise is received from other countries, which contributes to the hypothesis that this species could arrive as stowaways in shipments. On 9% of the publications, confusion between O. septentrionalis and the Eleutherodactylus coqui was observed. It is believed that Cuban tree frog is part of the diet of native species because 2% of the data were from Borikenophis portoricensis (Puerto Rican Racer) attacking this species. The source with greater efficiency was the Facebook groups with 95% of its sightings. The sources helped in the education and documentation of the species. In the future, we plan to increase the observations on other islands were this frog has invaded.
GESTURE CONTROLLED VARIABLE STIFFNESS WRIST BRACE

Presenter: Katiso Mabulu | Northeastern University

ABSTRACT

Current wrist braces are static with one functionality: to immobilize movement of the hand. However, long-term use leads to discomfort, while also limiting the user’s original range of motion. This project presents a variable stiffness wrist brace that corrects improper typing posture by alternating between a rigid and flexible configuration and controlled by the gesture of typing using a Myo EMG armband.

The Myo records electromyography (EMG) signals from the gestures and classifies between “typing” and “not typing” using a Decision Tree classifier and feature extraction methods mean absolute value (MAV) and variance (VAR). Through serial communication, the classifier drives a DC motor through an Arduino Nano microcontroller to transition between configurations. K-Fold Cross Validation reports the classifier accuracy as 90% and takes an average of 3 seconds to switch between configurations. This research aids in closing the gap between assistive/rehabilitative devices and gesture-controlled wearables by developing a dynamic multifunctional brace that reduces typing pains for individuals who suffer from osteoarthritis of the hand.

ENVIRONMENTAL AND ECONOMIC COMPARISON OF REUSABLE AND DISPOSABLE BLOOD PRESSURE CUFFS IN MULTIPLE SETTINGS

Presenter: Sarah Sanchez | Northeastern University

ABSTRACT

Objective: To assess the environmental and economic impacts of reusable and disposable blood pressure cuffs.

Setting: Out-patient clinic and ambulatory procedure rooms and five-day in-patient regular ward and intensive care unit (ICU) healthcare encounters.

Methods: Environmental modeling using life cycle assessment was employed to estimate greenhouse gas (GHG) emissions and other environmental impacts, from cuff manufacturing, packaging, transportation, use, cleaning, and landfill or incineration waste management. Cuff, cleaning, and packaging materials were identified and weighed directly. Both per-encounter and per-day low-level disinfection scenarios were performed. Life cycle costs were determined with hospital data, including procurement, labor (time-motion observations), and waste disposal.

Results: For all use and cleaning scenarios, the reusable cuff was environmentally preferable in terms of GHG emissions and other impact categories, in some cases by a factor of 40. Disposable cuff emissions are dominated by materials manufacturing, while reusable cuff emissions are dominated by production of disinfection wipes. Reusable cuffs are far cheaper than disposables in the out-patient settings. Disposable cuffs are slightly lower cost in the in-patient setting where reusable BP cuffs are shared among patients and, therefore, require frequent cleaning. However, reusable cuffs are also more economical in the in-patient settings when patients have dedicated personal equipment (i.e., stays with them during their entire health care encounter) whether cleaned daily or at the end of their stay.

Conclusion: Life cycle assessment and costing highlight environmental and financial trade-offs between manufacturing and cleaning when comparing reusable and disposable BP cuffs.

Financial support provided by the Department of Civil and Environmental Engineering at Northeastern University.
DETECTION OF ILLICIT AND PRESCRIPTION DRUGS DURING SPORTING EVENTS

Presenter: Zachary Ridge | Oklahoma State University

ABSTRACT

Wastewater epidemiology is a noninvasive tool that uses wastewater as a means to gather nondiscriminatory information about the exposure of a group of people to drugs, toxins, and diseases, which is accomplished by analyzing the wastewater for biomarkers specific to the analytes of interest. This study aimed to develop an analytical method for the simultaneous detection of 57 prescription and illicit drugs and their metabolites in wastewater obtained during sporting events. The epidemiological data obtained from this study can be used to inform public health and safety entities about the current use of prescription and illicit drugs in their community.

Wastewater samples were obtained from an unnamed football stadium, extracted via solid-phase extraction, and analyzed with liquid chromatography tandem mass spectrometry. The analytes of interest spanned several drug classes, including stimulants, opioids, benzodiazepines, and illicit drugs such as cocaine and PCP. Of the 33 samples analyzed thus far, 28 of the 57 compounds of interest were present in at least one sample, with 100% of samples containing at least one stimulant, opioid, and illicit drug and 24% at least one benzodiazepine. Future work will include validation of the solid phase extraction method, as well as the liquid chromatography tandem mass spectrometry method based on the guidelines set forth by the Scientific Working Group for Forensic Toxicology.

This research was funded in part by the National Science Foundation through the OK-LSAMP Bridge to Doctorate Program.

ALUMINUM INGESTION IN HONEY BEES: A SUBSPECIES PERSPECTIVE OF EXPOSURE RISK

Presenter: Ana Chicas-Mosier | Oklahoma State University

ABSTRACT

Poor mining practices and soil acidification increase bioavailability and uptake of aluminum by flora. Plant products, such as pollen and nectar, are ingested by honey bees and stored in the hive where larval bioaccumulation can occur. This presentation discusses free-flight choice-making, captive survival, motility, and acetylcholinesterase activity experiments in honey bees exposed to aluminum. Using free-flight experiments, such as artificial flower patches and floral nectary analogs, color choice was determined to vary after exposure, dependent on subspecies of honey bee. Additionally, captive experiments in Apis mellifera mellifera have shown that exposure makes circadian rhythmicity unstable, causes hyperactivity, and decreases lifespan. Behavioral and free-flight data have been corroborated by bee-head acetylcholinesterase enzyme activity and suggest a hormetic response in Apis mellifera mellifera while some tolerance is demonstrated in Apis mellifera lingustica. Determination of aluminum concentrations in bee heads and bodies is in process. The severity of the response to aluminum exposure is tied to subspecies, but effects of aluminum exposure have occurred across Apis mellifera spp. We conclude that aluminum exposure from floral products is likely a limiting factor to pollinator health and may contribute to population decline. However, further understanding of subspecies tolerance to toxicants is needed.

This research was funded in part by National Science Foundation Programs including the Graduate Research Fellowship Program (#1144467), Partnership for International Research and Education (OISE 1545803), and Louis Stokes Alliance for Minority Participation Bridge to the Doctorate (#HRD-1612560).
ANALYSIS OF THE INTERACTIONS BETWEEN CRYPTOCOCCUS NEOFORMANS AND PULMONARY MACROPHAGES

Presenter: Ashlee Hawkins | Oklahoma State University

ABSTRACT

Cryptococcus neoformans, an intracellular fungal pathogen, causes cryptococcal meningitis. The pathogen has the ability to evade the immune response by surviving within select pulmonary macrophages. With over 220,000 cases and 180,000 deaths annually, C. neoformans is the most common cause of adult meningitis and a leading cause of death in HIV/AIDS patients in Sub-Saharan Africa. This study is being conducted to understand the mechanism of interaction between C. neoformans and pulmonary macrophages using a murine model.

We hypothesize that there is differential clearance of C. neoformans by alveolar and pulmonary tissue macrophages. For these studies, we used killing assays and flow cytometry. Results showed that both alveolar and tissue macrophages inhibited C. neoformans growth. Flow cytometric analysis showed distinct macrophage subset populations, as detailed in previous murine lung research, within the tissue macrophage group that included Ly6C-, Ly6C+, monocytes, and interstitial macrophages. Further analysis of the tissue macrophage population showed cryptococcal inhibition within monocytes and cryptococcal intracellular replication within interstitial macrophages. Future studies will use fluorescence microscopy to determine morphological changes within macrophage populations and single-cell RNA sequencing to determine which genes are up- or down-regulated within the subsets, following interaction with C. neoformans. Understanding the mechanisms which allow C. neoformans to successfully survive and replicate within pulmonary macrophages can serve as a key target when developing a therapeutic strategy to prevent the manifestation of cryptococcal meningitis.

This research was funded in part by National Institutes of Health, Oklahoma Center of Infectious and Respiratory Diseases, and OK-LSAMP Bridge to Doctorate Fellowship.
STUDENT CONFERENCE EXPERIENCE

DRESS FOR SUCCESS
Friday - School colors and spirit gear
Saturday - Business casual or better
Sunday - School colors and spirit gear

STUDENT SCHEDULE OF EVENTS

All times are EDT.

FRIDAY, OCTOBER 25
3:30-5:30 PM  Pre-Conference Student Workshop
   PhD! Why Not Me? with Cammi Valdez, PhD
   Plaza Suite 6 & 7
6-8 PM   Networking Reception with Brian Thomas
   Music, food, games, and networking
   Dinner on Your Own
   Clearwater Hallway

SATURDAY, OCTOBER 26
6:45-8 AM  Continental Breakfast Buffet
   Plaza Hallway
8:30-9:15 AM  Opening Keynote
   Plaza Ballroom
9:30-11:30 AM  Student Poster Session
   Clearwater Ballroom
11:45 AM-12:15 PM Lunch Buffet
   Plaza Hallway
12-1:15 PM  Luncheon Keynote
   Plaza Ballroom
1:15-2:15 PM  Voices of Success Panel
   Plaza Ballroom
2:30 PM  READ IT Theory to Success with Brian Thomas
   Clearwater Ballroom
4-5:30 PM  Resource Fair
   Clearwater Hallway
5:30 PM  Day’s Wrap-up with Brian Thomas
   Dinner on Your Own
   Plaza Ballroom

SUNDAY, OCTOBER 27
7-8:30 AM  Continental Breakfast Buffet
   **Check out of your room; hotel will hold bags.**
   Lobby
9:15-11:15 AM  Professional Development Sessions
   Plaza Hallway
11:25 AM  Awards Ceremony and Closing Remarks
   Plaza Ballroom

READ IT Theory to Success with Brian Thomas
Saturday, October 26
2:30-4 PM
Clearwater Ballroom

The transition from the college world to the real world can be daunting and treacherous for many students. “READ IT Theory to Success” will provide strategies and tactics for developing new skills well before students cross the stage. These skills will help maximize college student and young professional experiences, launching their careers towards greatness.

SUNDAY SESSIONS (choose one)
9:15-11:15 AM

TRACK A: IUPUI’s Multicultural Leadership Empowerment Program (see page 21)
Anneka Scott and Katherine Shr | IUPUI
Plaza Ballroom D & E

TRACK B: Accelerate Your Professional Writing: Using Resources to Deliver a Quality Literature Review in Less Time (see page 21)
Sean Stone | Indiana University
Plaza Suite 9 & 10

TRACK C: GEM Fellowship Workshop
Plaza Ballroom
ACKNOWLEDGMENTS

Our sincere appreciation to the following for their efforts to support the 2019 LSMRCE Conference.

LSMRCE 2019 ADVISORY BOARD
Alec Gates | Rutgers University; Garden State LSAMP
Ben Flores | University of Texas El Paso; Texas Systems LSAMP
Michael Kaminiski | Argonne National Laboratory
Rabiah Mayas | Northwestern University
Willie Pearson | Georgia Institute of Technology
Herb Schroeder | University of Alaska, Anchorage; ANSEP
Jamal Smith | The Lead Change Project
Karmell Thomas | Eaton Corporation

LSMCE 2019 STUDENT EXPERIENCE CONFERENCE COMMITTEE
Adolfo I. Alvarado Rivera | Central Florida University; CFSA LSAMP
La’Nese Lovings | University of Toledo, LSMRCE
Nicolas Means | University of Oklahoma; OK-LSAMP
Brian Thomas | KIPNspire; ARK-LSAMP

PANEL MODERATORS
Eda-Davis Lowe | Valencia College; CFSA LSAMP
Brenda Morales | Oklahoma State University; OK-LSAMP
Pamella Shaw | Ohio State University; LSMRCE

INTERNS
Sophia Cole | Lawrence Central HS
Mateo Escobedo | Lawrence Central HS
Elysa Thompson | IUPUI
Conference photos at the event provided by Paul Quirke Photography.
Conference video at the event provided by Cookie Jar Productions.

OTHER SUPPORT
IUPUI Academic Affairs Conference Grant

HOTEL INFO

Sheraton Indianapolis Hotel at Keystone Crossing
8787 Keystone Crossing
Indianapolis, Indiana 46240
(317) 846-2700

CHECK-IN AND CHECK-OUT
Check-in is at 3 PM EDT.
Check-out is at 12 PM EDT.

PARKING
Complimentary self-parking is available on site.

RESTROOMS
Guest restrooms are located on the main level, near the front desk. Additional facilities are located off the hallway, near the Golden Ballroom conference rooms.

LOST AND FOUND
If left in a meeting room, lost and found items will be taken to the front desk by banquet staff.

INTERNET ACCESS
Complimentary Wi-Fi internet connection is available throughout the hotel to conference guests.

HOTEL FEATURES
Located in the heart of Keystone at the Crossing shopping area that offers many dining and entertainment options
• Business center
• Heated indoor pool
• 24-hour fitness center
• Concierge services
• Keystone Cafe restaurant and Keystone Lounge

AIRPORT TRANSPORTATION
The Sheraton Indianapolis Hotel at Keystone Crossing is located approximately 40 miles from the Indianapolis International Airport (IND). Contact the hotel concierge for ground transportation. One-way rates to and from the airport range from $60 for taxi to $30 for Uber or Lyft.