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Endeavor Symposium Program

Thursday April 7, 2016

- 7:30– 8:30 a.m. Checkin for all presenters and sponsors: Pick up your programs and ID badges at registration table (located in 2nd floor UC hallway, next to Conference Services Desk)
- 8:30– 11:40 a.m. Oral Presentations, Rooms JC2205, and 2206
- 8 a.m. – Noon Poster Sessions, University Center, Carter Hall D (note: all posters must be removed from Carter Hall D by noon).
- 12:00– 1:00 p.m. Endeavor Luncheon for student participants and mentors, Carter Hall A or C. Your badge will serve as your lunch and Creativity Awards Committee

Michael Strezewski Director of Endeavor Awards for Research and Creativity, Associate Professor of Anthropology, College of Liberal Arts

Jeannie Collins Associate Professor of Chemistry, Pott College of Science, Engineering and Education

Rebecca Deeg Grant Administrator, Office of Planning, Research and Assessment

Ronald Diersing Associate Professor of Engineering, Pott College of Science, Engineering and Education

Lifang Gao Instructor in Management, Romain College of Business

Rob Millard Mendez Associate Professor of Art, College of Liberal Arts

Erin Reynolds Assistant Professor of Health Services/Administration, College of

Acknowledgements

The Endeavor Committee thanks the following for their support of the Endeavor Research and Creativity Award Program and Endeavor Symposium:

- Dr. Linda Bennett, President, University of Southern Indiana
- Dr. Ronald Rochon, Provost
- Dr. Shelly Blunt, Associate Provost for Academic Affairs
- Michele Duran, Senior Administrative Associate, Office of the Provost
- College of Business
- College of Liberal Arts
- College of Nursing and Health Professions
- Pott College of Science, Engineering and Education
- USI Honors Program
- USI Office of Special Events

Endeavor Faculty Mentors

- Dr. Antonina Bambina
- Dr. Jeri Burger
- Dr. Jeannie Collins
- Ms. Joy Cook
- Dr. Kim Delaney
- Dr. Cindy DeLoney Marino
- Dr. Joseph DiPietro
- Dr. Paul K. Doss
- Dr. Kerry Hall
- Ms. Emily Holt
- Dr. Michael Kearns
- Dr. Paul Kuban
- Dr. Eric McCloud
- Ms. Jeanette Maier Lytle
- Dr. Anton Maria
- Ms. Heather Schmuck
- Ms. Jamie Seitz
- Dr. Jeffrey Seyler
- Dr. Hui Shi
- Dr. Natasha Smith
- Dr. Rebecca Sparks Thissen
- Dr. Rex Strange
- Dr. Edmir Wade
- Ms. Beth A. Young
- Dr. Stephen Zehr

8 a.m. POSTSESSION

Carter Hall, D

Maria Anderson and Daniel Mann The Inner Membrane Protein YhiM is Required for Growth of Escherichia coli in Different Environmental Conditions Including Low Cell Number and High Temperature

Mariah Gatewood Glioblastoma Multiforme: Under Pressure

Mariah Gatewood Make Time for Quality

Regan Grieger Moyamoya Disease: A Rare Killer

Kevin Howard Petrography and Geochemistry of Igneous and Metamorphic Core Samples from the Omaha Dome in South Dakota

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9:10 a.m. POSTSESSION

Carter Hall D

Maria Anderson and Daniel Mann	The Inner Membrane Protein YhiM is Required for Growth of Escherichia coli in Different Environmental Conditions Including Low Cell Number and High Temperature
Dmitriy Bachynsky	Analysis of Binding of a Substrate Analog to Enzymes Using NMR
Mariah Gatewood	Glioblastoma Multiforme: Under Pressure
Mariah Gatewood	Make Time for Quality
Regan Grieger	Moyamoya Disease: A Rare Killer
Jordan Jones	Friedreich's Ataxia
Jessica Litherland	Development of a Student Athlete Nutrition Guide and Cookbook
Timothy Luczak	Incorporating Music into the Math Classroom
Scott Luke	The Importance of Professional Societies
Daniel Mann	Requirement of the Inner Membrane Protein, YhiM, for E. coli Growth in High Temperature and Reduced Salinity Environments
Kyle Mehringer	Synthesis of

Oral Presentations

Session I, UC2205

- 8:30–8:55 Gerlyn Murrell – World Systems Theory versus PostColonialist Theory Explanations of CrossNational Inequality: A Study of Six Nations from Three World Regions
- 9:00–9:20 Alex Hoffman – NCHC Student Toolkit
- 9:20–9:50 Jace Bittner – Implementing an Interactive 3D Model Approach to Virtual Tour Design: A Case Study of the Business and Engineering Center
- 9:50–10:20 BREAK
- 10:20–10:40 Dennis Begeman – Detecting Stable Isotopic Change of Groundwater in the Inglefield Sandstone Aquifer, and Precipitation in Southwestern Indiana
- 10:40–11:00 Leanna Myers – Exploring the Link Between Type II Diabetes and Cognitive Decline
- 11:00–11:20 Crystal Thompson – "The Color of Me" Persona Fiction
- 11:20–11:40 Luis Macias, Alicia Bowling, Jacob Titzer, and Kelley Lott – Heavener International Case Competition

Session II, UC2206

8:30–8:55 Cynthia Edlin, Emily Naas, and Mickala Snyder – Taking a Bite Out of Crime – The Science of Forensic Dentistry

9:00–9:25 Courtney Potter – The Role and Importance of Importance of

Make Time for Quality

Mariah Gatewood

Faculty Mentor: Ms. Heather Schmuck

Computed Radiography (CR) is used in many imaging facilities. Other current research has already concluded that processing

despite a respectable showing in competition, the HPV was difficult to drive and lacked some valuable safety features. This year, the USI ASME chapter is adding a vehicle stabilization feature to make the vehicle start up smoother and to maintain rider stability while in motion. In addition, the team has designed a lightweight DC power generator and storage system to power required road safety items on the vehicle, such as headlights and brake lights. Finally, the DC Power system will operate an additional safety feature to check blind spots. These added features are expected to improve rider safety and increase the ease of operation.

Friedreich's Ataxia

Jordan Jones

Faculty Mentor: Ms. Joy Cook

Friedreich's Ataxia (FA) is a neurodegenerative genetic disorder that occurs in roughly 1 of 50,000 persons. Individuals with FA experience difficulty walking, loss of voluntary control, and muscle weakness. The primary cause of FA is the lack of frataxin that is made to help synthesize iron in the blood for energy. FA targets the areas of the posterior portion of the brain, the cerebellum, and the spinal cord. Magnetic resonance imaging (MRI) is the imaging modality preferred in diagnosing FA. Currently, there is no known cure for FA, but research is underway.

Development of a Student Athlete Nutrition Guide and Cookbook

Jessica Litherland

Faculty Mentor: Ms. Beth A. Young

The purpose of this project was to develop and distribute a sports nutrition guide and cookbook entitled *Eagles Eating Strong*, which will aid in making healthy food choices to maximize an athlete's performance. *Eagles Eating Strong* will be distributed to all University of Southern Indiana (USI) athletes, local high school coaches, and to our USI Food and Nutrition alumni who work with athletes in the community. *Eagles Eating Strong* will be used as a community outreach and educational tool. Both an electronic and printed version of the nutrition guide have been produced for future USI athletes and coaches, USI alumni, as well as area coaches. *Eagles Eating Strong* was formulated by first collaborating with the Athletic Department and requesting all of the athletes on the university's campus to contribute their favorite recipes that they prepare for pre or post exercise/competition. Students and staff from the Food and Nutrition Department at USI also contributed recipes that were used in the guide. The recipes were analyzed using the SuperTracker program on the Choose My Plate website. Standards were established based on the SCAN (Sports, Cardiovascular and Wellness Nutrition) DPG's materials, to classify the recipes as an appropriate choice for pre, during, or post exercise/competition. If a recipe did not meet the predetermined standards, substitutions were made. The nutrition guide portion of *Eagles Eating Strong* contains sport-specific information for student athletes. Nutrition topics and content found in *Eagles Eating Strong* include; cooking basics, recipe substitutions, seasonal produce charts, cost-effective shopping tips and food safety. Sports nutrition basics were also included.

Thesetopics include; pre competition nutrition, nutrition during exercise, and post exercise/recovery nutrition. Vegetarianathletes, travel tips, portion sizes and sample meal plans are also found in the guide.

Antibiotic Resistance Profiles of Staphylococcus aureus Isolates Cultured from Common Areas at the University of Southern Indiana Campus

Tabatha Loppnow and Eric Scheiber

Faculty Mentor: Dr. Cindy DeLoney Marino

While infection by antibiotic resistant strains of Staphylococcus aureus including Methicillin Resistant S. aureus in clinical settings is well known, the transmission of these strains in non clinical settings has not

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case. After the 24 hours of analysis teams presented during their allotted times, cases were judged by Exactech executives and alumni of the case competition. Fifteen minutes of protected time for presentation was given following a 15 minute section of question and answer. Once all contestants presented a dinner was held to hold the winners of the first round of the competition. Points were awarded to competitors based on analysis, feasibility, presentation, and overall look of the presentation. Based on ranking points were awarded and accumulated to the next case. The second case over the company Crom was distributed to competitors on Thursday February

direct effect on the growth of this organism in certain conditions, like high temperature and reduced salinity. We tested the ability of YhiM mutants to grow in high temperature and low salt conditions using optical density and viable cell counts. When the wild type organism, possessing the YhiM protein, and the mutant, lacking the YhiM protein, were put in conditions of 37°C with NaCl in the media both organisms grew, but the mutants possessed a hour and a half longer lag phase. We then tested whether our mutants could grow at 37°C without NaCl. The mutants had a longer lag phase, about half hour longer than when the NaCl was present. We next tested whether YhiM was necessary for growth at high temperature. When the wild type and mutants were placed in growing conditions of 41°C the mutants grew slower than the wild type with a longer lag phase and during exponential growth. When the wild type and mutants were placed in conditions of 41°C and lacking salts in the media, the wild type was able to grow, but no growth of the mutant bacteria was detected. The conditions of high temperature and no salinity provides for minimal, if any, growth for the YhiM lacking mutants. The data indicates that the YhiM is necessary for the survival and growth in additional conditions of cellular stress. In particular, data indicates that YhiM plays a role in mediating growth and survival in high temperature and low salt conditions.

Synthesis of Ethynyl Substituted Pincer Ligands

Kyle Mehringer

Faculty Mentor: Dr. Jeffrey Seyler

The study of Iridium pincer catalysts has proven useful in changing alkanes to alkenes by removing dihydrogen (H_2). This process has been seen as a potential use in on board vehicles as an alternative fuel source. Changing the ligands that are attached to these use ~~attache~~ ~~the~~

two countries from each of the Asian, African, and South American regions. I hypothesize that there will be variability in economic development

these methods will produce a more broad variety of organic compounds. These techniques could then be utilized with known medicinal herbs from local, national, and international locations.

Contributions of Wing Condition and Wing

purpose of medical professionals as seen by the respondents is either primarily to treat the local or to



perhaps then reduce its prevalence. Our study wished to see if another first world country in Europe was able to provide better mental health care than the United States. To do this, we interviewed five health care professionals in the United States and five more in Germany. For each participant, we used the same interview guide to ensure consistency in the interview process. We asked about things such as how mental health was promoted in the local area, caring for people with mental illness, and how the general public looked at a person with a mental illness. After collecting the data from all participants and recording it via audio recording device, the data were then transcribed and subsequently coded. Coding the data brought out themes shared between the two countries and themes that were not. Those themes that were in common included patients feeling embarrassed about having a mental illness and anxiety over the diagnosis. It was found that Germany's method of treatment was very diagnosis specific and rooted deeply in a theoretical basis concerning stigma. In contrast, the United States took a more team oriented approach by integrating multiple interdisciplinary persons more frequently. Reports from the United States also indicated that nurses felt as though patients had a great sense of relief following treatment. This theme did not seem evident in Germany and participants from this country seemed to think that mental illness was less easily treated.

Plan to Attend

The 2017 Endeavor! Undergraduate
Research and Creative Work Symposium
University Center

Thursday, April 6, 2017

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