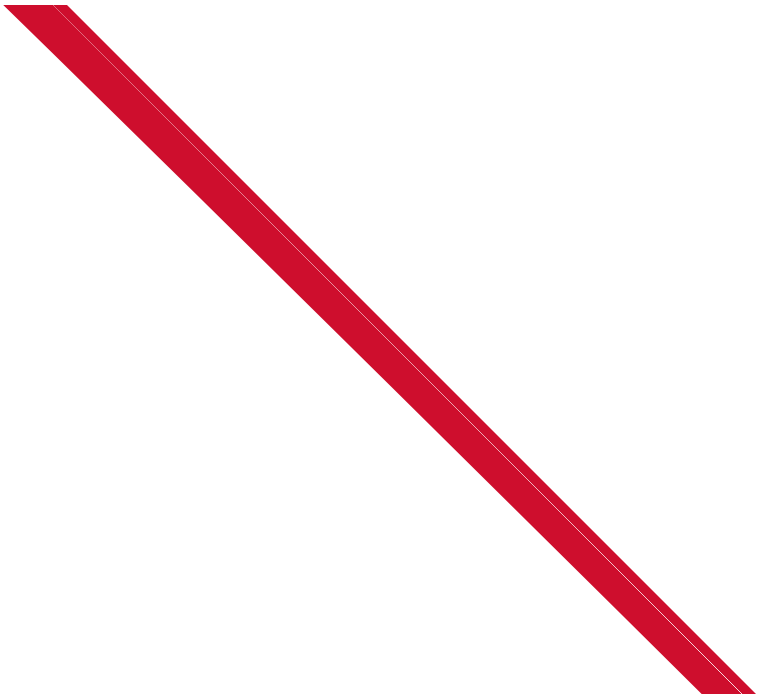

Endeavor Symposium Program

Thursday, April 12, 2018

Beginning at 7:45	**Check-in** for all presenters and sponsors: Pick up your programs and ID badges at registration table (located in the hallway outside Carter Hall).
9:00 – 10:00 a.m.	**Oral Presentations**, Room UC 226-227 (near Carter Hall).
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-C*. Your badge will serve as your lunch ticket.

Endeavor Research and Creativity Awards Committee

Dr. Michael Strezewski	Director of Endeavor Awards for Research and Creativity, Associate Professor of Anthropology, College of Liberal Arts
Dr. Jeannie Collins	Associate Professor of Chemistry, Pott College of Science, Engineering, and Education
Ms. Rebecca Deeg	Grant Administrator, Office of Planning, Research, and Assessment
Dr. Ronald Diersing	Associate Professor of Engineering, Pott College of Science, Engineering, and Education
Mr. Rob Millard-Mendez	Professor of Art, College of Liberal Arts
Dr. Erin Reynolds	Assistant Professor of Health Services/Administration, College of Nursing and Health Professions
Dr. Edmir Wade	Associate Professor of Chemistry, Pott College of Science, Engineering, and Education

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
- Kathryn Reneer, Manager of Conference and Meeting Planning
- Romain College of Business
- College of Liberal Arts
- College of Nursing and Health Professions
- Pott College of Science, Engineering, and Education
- USI Honors Program

Endeavor Faculty Mentors

- Mr. Brett Anderson
- Dr. Alex Champagne
- Dr. Jeannie Collins
- Dr. Julian Davis
- Dr. Christos Deligkaris
- Dr. Paul Doss
- Dr. James Durbin
- Dr. Jennifer Evans
- Dr. Chad Gonnerman
- Dr. Eric Greenwood
- Dr. Priya Hewavitharanage
- Ms. Emily Holt
- Dr. Glen Kissel
- Ms. Sue Krieg
- Dr. Tony Maria
- Dr. Kent Scheller
- Dr. Susan Seibert
- Dr. Melissa Stacer
- Dr. Edmir Wade

8-9 a.m. POSTER SESSION

Carter Hall D

Bethany Bremer, Alley Gilliland, and Sidney Heldt	Ongoing Oral Care for Oncology Nurses
Cynthiana Dillman, Brittany Benningfield, and Makenzie Norris	Unintended Oral Benefits of Bisphosphonates
Maverick Grayer	Geometry, Electronic Structure and Physico-chemical Properties of the Carcinogenic NNK Diazonium Ion
Jessica Gudorf	Extraction of Quercetin from Onions
Breanna Hampton, Coradrian Lopez, and Kylee King	Routine Dental Care Keeps the Bad Grades Away
Jessica Jensen, Laura Baker, and Kyla Borden	Periodontal Treatment and its Effects on Alzheimer's Disease
Ryan Loehrlein, Collin Runnion, and Kegan Miller	Undergraduate Nano Ionospheric Temperature Explorer (UNITE)
Jessica Miller, Marisa Volkman, and Kate Whitaker	Preventive Dental Care: The Impact on Cystic Fibrosis
Jonah Quirk	Langmuir Plasma Probe Measurements in a Simulated Atmospheric Plasma
Megan Ritterskamp	XRF Analysis of Trace Elements in Soils Surrounding a Coal-Fired Power Plant, Posey County, Southwestern Indiana
Molly Schmahl, Alexa Shoemaker, and Hannah Buley	Enamel Erosion: Adding a Basic Routine to Combat Morning Sickness

Laura Unfried	Advances in the Timing of Reproduction in Two Species of Cavity Nesting Birds in Response to Climate Change

9-10 a.m. POSTER SESSION

Carter Hall D

Megan Ritterskamp	XRF Analysis of Trace Elements in Soils Surrounding a Coal-Fired Power Plant, Posey County, Southwestern Indiana
Jacob Robbins	The Hybrid Account of Knowledge-how
Kody Russelburg and Ryan Hopf	Development of a Dithiepin Framework for Novel Host Molecules
Molly Schmahl, Alexa Shoemaker, and Hannah Buley	Enamel Erosion: Adding a Basic Routine to Combat Morning Sickness
Laura Unfried	Advances in the Timing of Reproduction in Two Species of Cavity Nesting Birds in Response to Climate Change

10-11 a.m. POSTER SESSION

Carter Hall D

Brian Cantwell, Rayce McClary, and Andrew Roth	USI SAE Baja Club Suspension Behavior
Justin Cecil	Industrial Plate Aluminum and its Use as a Lithographic Matrix
Dakota Eble	Conversion of Blue-green Light to Red Light on a Glass Slide
Livia Hopper	Patterns of Cutaneous Water Loss and Stratum Corneum Lipid Interactions during the Development of Japanese Quail
Rachel Louviere, Brooke Teike, and Emily Wonnell	Fostering Oral Health Care
Payton Lykins	Evaluating the Source of Anomalous Earth-tide Signals in the Inglefield Sandstone
Maxia Monge and Kassie Robinson	Caries Prevention in Homebound Elders
Jacob Robbins	The Hybrid Account of Knowledge-how
Kody Russelburg and	Development of a Dithiepin Framework for Novel Host Molecules

Ryan Hopf	
Samantha Sellers, Madalyn Schadler, and Katelyn Sheneman	Preliminary Analysis of Non-Muscle Motor Protein
Hannah Walker	Using GIS to Develop a Comprehensive Natural Hazards Inventory for the Indiana-Illinois-Kentucky Tristate Area

11 a.m. - noon POSTER SESSION

Carter Hall D

Brian Cantwell, Rayce McClary, and Andrew Roth	USI SAE Baja Club Suspension Behavior
Justin Cecil	Industrial Plate Aluminum and its Use as a Lithographic Matrix
Livia Hopper	Patterns of Cutaneous Water Loss and Stratum Corneum Lipid Interactions during the Development of Japanese Quail
Ryan Loehrlein, Collin Runnion, and Kegan Miller	Undergraduate Nano Ionospheric Temperature Explorer (UNITE)
Maxia Monge and Kassie Robinson	Caries Prevention in Homebound Elders
Samantha Sellers, Madalyn Schadler, and Katelyn Sheneman	Preliminary Analysis of Non-Muscle Motor Protein
Hannah Walker	Using GIS to Develop a Comprehensive Natural Hazards Inventory for the Indiana-Illinois-Kentucky Tristate Area

Oral Presentations
UC 226-227

9:00 – 9:20 **Kimberly Bell, Rachel Smith, Lucinda Hardison, Anne Kiboi, Grace Voyles, Allison Schroering, Sarah Mehringer, and Anna Heckman** - A Collaborative Approach to Educating Evidence Based Practice among BSN Students and Rural Hospital Nurses

9:25 – 9:40 **Lydia Moll** - "They are People Like You and Me": Student Perceptions of Inmates

9:45 – 10:00 **Ethan Duncheon** - Disordered Skin Lipids Increase Cutaneous Water Loss in Pigeons at High Temperatures

Oral and Poster Presentation Abstracts

A Collaborative Approach to Educating Evidence Based Practice among BSN Students and Rural Hospital Nurses

Kimberly Bell, Rachel Smith, Lucinda Hardison, Anne Kiboi, Grace Voyles, Allison Schroering, Sarah Mehringer, and Anna Heckman

Faculty Mentors: **Dr. Susan Seibert, Dr. Jennifer Evans, and Ms. Sue Krieg**

The Chief of Nursing Officer (CNO) of a small rural hospital expressed a need for the nursing staff to gain proficiency in Evidence Based Practice (EBP). Through networking within a nursing research consortium, a partnership was established with the University of Southern Indiana's nursing program. The teaching strategy used was a student-driven interactive learning model. The goal was to increase the BSN students' confidence in teaching and to increase the RN's knowledge of EBP in order to implement EBP into their practice.

Nursing students met with the CNO and devised a timeline to introduce EBP to the nursing staff during the unit staff meetings. Students attended unit staff meetings offered at two different times, to accommodate varying shifts. Each educational session built on the previous one. Nursing students created educational handouts and provided tools to aid in interactive learning. The topics included EBP definitions, the process of EBP, finding scholarly resources in the hospital database, and how to appraise evidence. Interactive strategies included guided PICOT question formation, facilitated database searches, and demonstrations of article appraisal.

The project established a relationship between the university and a rural hospital. The staff RNs gained an understanding of EBP and implemented EBP into their practice by utilizing the resources used within the educational sessions for unit projects. The project also benefited the students by creating an opportunity for them to develop and deliver educational in-services and increase their own con Ĥ M 6 M Ə

Industrial Plate Aluminum and its Use as a Lithographic Matrix

Justin Cecil

Faculty Mentor: **Mr. Brett Anderson**

Traditionally Bavarian limestone blocks have been used for fine art lithography for more than 200 years. These limestone blocks are no longer quarried. Commercially available ball-grained plates have also been used in the production of lithographs, but they can only be used once. Both limestone blocks and ball-grained plates have become cost prohibitive because of resource scarcity or commercial obsolescence. Current prices for second-hand, large lithographic stones can cost upwards of $5000. A sheet of industrial aluminum alloy of similar size can be acquired locally for less than $80. We have successfully grained the surface of these aluminum plates for repeated use and have found them to accommodate most traditional lithographic drawing materials quite well. Though the grained surface of these aluminum alloy sheets is processed for lithographic printing like commercial ball-grain plates, artists should be able to resurface an alloy plate hundreds of times. From our research we have completed a studio manual for this lithographic technique, providing a valuable learning resource for future students who take printmaking, making the process more approachable.

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cavity. Radiographs should be taken regularly to monitor alveolar bone levels. Dental hygienists should also be more proactive by going out into the community to serve this specific population.

Disordered Skin Lipids Increase Cutaneous Water Loss in Pigeons at High Temperatures

Ethan Duncheon

Faculty Mentor: **Dr. Alex Champagne**

As ambient temperature (TA) increases, many animals increase total evaporative water loss (TEWL) to maintain a constant body temperature. In Passerine birds, the increase in TEWL is mainly attributed to an increase in respiratory water loss, whereas water lost through the skin as cutaneous water loss (CWL) increases only modestly. However, pigeons and doves (Columbidae) exhibit an opposite trend, greatly increasing CWL with only a small increase in respiratory water loss. The unique ability of pigeons and

Geometry, Electronic Structure and Physico-chemical Properties of the Carcinogenic NNK Diazonium Ion

Maverick Grayer

Faculty Mentor: **Dr. Christos Deligkaris**

The compound 4-methylnitrosamino-1-3-pyridyl-1-butanone, abbreviated NNK, is a carcinogen found in tobacco products. Although NNK does not directly form DNA adducts, it is metabolized by cytochrome P450 into a variety of intermediates that can methylate and pyridyloxobutylate DNA. The NNK diazonium ion is a carcinogenic intermediate that is produced when α-hydroxylation occurs at the methyl ca ř N_haسج V

implemented to help support that quercetin was in fact extracted from red onions. These techniques could include Gas Chromatography coupled with Mass Spectrometry (GC/MS) or High Performance Liquid Chromatography (HPLC). Lastly, determining the amount of quercetin in red onions would be beneficial because the data can then be compared to the amount of quercetin in other onion species or in different fruit and vegetables.

Routine Dental Care Keeps the Bad Grades Away

Breanna Hampton, Coradrian Lopez, and Kylee King

Faculty Mentor: Ms. Emily Holt

Dental caries is the most prevalent childhood dise ş T a f a ® T n ta z Ğ o aq Ğ %

Undergraduate Nano Ionospheric Temperature Explorer (UNITE)

Ryan Loehrlein, Collin Runnion, and Kegan Miller

Faculty Mentor: **Dr. Glen Kissel**

These Endeavor grants are in support of the USI's CubeSat team effort to design, build and fly a CubeSat, called the Undergraduate Nano Ionospheric Temperature Explorer (UNITE). This small spacecraft is designed to probe the plasma in the Earth's lower ionosphere and measure the temperatures on and within t t' r t ' 4

there are blockades as well. The improved oral health of a child after entering the foster care system is too circumstantial to prove conclusive.

Seven peer-reviewed journal articles, one non-peer reviewed journal articles, three websites, and one book were used to answer the clinical question. It was difficult to find literature on the dental conditions of homebound individuals but many sources validate the increased risks on the health of the oral cavity associated with xerostomia. Because therapeutic treatment of both, over the counter and physician prescribed medications is fairly new, research has not been conducted on dental caries formation as a direct result of untreated xerostomia compared to those who properly treat xerostomia. Therefore, to directly answer the clinical question, more studies are required.

Unfortunately, research has not determined if the incidence of caries is reduced when xerostomia is treated in homebound elders. Most data reflects adequate salivary flow has a positive impact on sustaining proper oral health. Dental clinicians and caregivers should assess homebound patients for xerostomia. They should educate the homebound elder on how to treat xerostomia and the risk of developing dental caries. Because of the decrease in dexterity, some elder patients may need the dental hygienist to incorporate patient specific modified dental products to promote plaque removal.

Langmuir Plasma Probe Measurements in a Simulated Atmospheric Plasma

Jonah Quirk

Faculty Mentors: **Drs. Kent Scheller and Eric Greenwood**

The ionosphere is a region of the atmosphere made of partially ionized gases due to solar radiation. These ionized gases constitute a plasma. This region of the atmosphere is critical to the propagation of electronic signals for communications purposes. The plasma in this region can severely hinder this propagation depending on its temperature and electronic properties. The motivation for this project was to model the plasma in the ionosphere using a plasma chamber and to measure the characteristics of this plasma utilizing a Langmuir plasma probe. These probes are used to measure parameters such as the plasma temperature and density.

Langmuir plasma probes operate by immersing a probe in a plasma and varying the electric potential (voltage) applied to the probe. As the potential is varied, ele(L

Preliminary Analysis of Non-Muscle Motor Protein

natural hazards maps to improve prediction and mitigation techniques and lessen risk to communities in the United States. The intent of this study is to create a comprehensive inventory of natural hazard occurrence in the Indiana-Illinois-Kentucky tristate area from 1997 to 2017. The tristate area includes 36 counties from Indiana, Illinois, and Kentucky. These states seek to share stable and secure business, work force, and financial resources and will benefit from a comprehensive natural hazards map of the area. Natural hazards to be included in this study are droughts, earthquakes, floods, winter storms, severe storms, and tornadoes. Droughts defined by several drought indices including the Standard Precipitation Index and the Palmer Drought Severity Index will be included, as will all earthquakes and tornadoes that occurred in this region during the time frame. Winter and severe storms designated as disaster declarations by FEMA will be included. It is unclear at this point how flood events will be designated, but they may be defined by flood inundation areas and/or FEMA disaster declarations. The development of a map that locates the occurrence and distribution of natural hazards from the previous 20 years can be used by local and regional governments and emergency responders to improve economic development and prediction and mitigation responses to natural hazards. The findings of this study will be an important

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The 2019 Endeavor Undergraduate

Research and Creative Work Symposium

University Center

Thursday, April 11, 2019

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