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Undergraduate Research Symposium

UMSL Undergraduate Works

2015

2015 Program

University of Missouri-St. Louis

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URS

Undergraduate Research Symposium

research • scholarship • creative works

2015

GOLDEN KEY INTERNATIONAL HONOUR SOCIETY

UNIVERSITY OF MISSOURI-ST. LOUIS

Mission Statement

The members of the University of Missouri–St. Louis chapter of Golden Key International Honour Society are committed to the creation of educational opportunities and the development of leadership skills. As leaders, we are dedicated to formulating a paradigm for student activism that preserves and advances the interests and reputation of our campus and its faculty.

In 2002, Golden Key members designed the Undergraduate Research Symposium (URS) to furnish a venue for undergraduate students to present their research, scholarship, and creative works as they would at a professional conference. This multidisciplinary event is intended to help students achieve their educational and professional goals by presenting students an opportunity to refine their communication skills and network with scholars. The URS also provides an opportunity for faculty and the broader academic community to express support for the undergraduate scholars in furthering their research and graduate studies.



What is Golden Key?

Golden Key International Honour Society is an academic honor society that recognizes and encourages scholastic achievement and excellence among college and university students from all academic disciplines. In an effort to reflect the Society's diversity and international presence, Golden Key uses the globally accepted spelling of "honour" in its name.



Chapter Officers 2014–2015

Eric'el Johnson, President

Aaron Kravish, Treasurer

Anna Glushko, Secretary

Michael Baryo, Campus & Community Outreach Director

Megan Smith, Public Relations Director

Stephany Lakey, SGA Representative

Jodi Heaps, PhD, Co-Advisor

Kathryn A. Walterscheid, PhD, Advisor



The mission of Golden Key:

To enable members to realize their potential by connecting individual achievement with service and lifelong opportunity

The values of Golden Key:

Integrity, Collaboration, Innovation, Respect,

Diversity, Excellence, Engagement

URS

Undergraduate Research Symposium

The URS Committee

Mark E. Stone, Committee Chair

Eric'el Johnson, Oral Presentation Coordinator

Jodi Heaps, PhD, Poster Editor

Kathryn A. Walterscheid, PhD, Faculty Director

URS Crew

Teresa Helms

Melissa Somerdin

Hannah Read

Melaney Walterscheid

Karlyne Killebrew

Stefanie Paige

Addy Lai

Aaron Kravish

We also want to recognize the many URS members
who volunteered after this book went to press.

Thanks to the URS Sponsors

Primary Sponsors



Pierre Laclede Honors College
Student Affairs

Co-Sponsors

University Program Board (UPB)
UMSL Student Government Association (SGA)

Awards

The UMSL chapter of Sigma Xi, The Scientific Research Society, will present three awards for posters. Faculty judges will assess the posters on content and style, and the presenters on their interaction with the audience. The URS gratefully acknowledges the support of the Des Lee Collaborative Vision and the E. Desmond Lee Endowment of Professor Patricia Parker for providing the poster awards and to Sigma Xi for providing judges.

Graduate School Application-Fee Waivers

The Graduate School is awarding application-fee waivers to URS Participants. The URS Committee will be sending a list of URS participants to the graduate school. To use the waiver, put "URS fee waiver" under comments or statement of purpose when you register.

Acknowledgments

The members of Golden Key would like to thank all of the dedicated administrators, faculty, and staff who have inspired and helped us. In particular, we wish to express our appreciation to the following individuals:

Christopher Schott, Writing Center Coordinator

Jay Frey, Printing Services

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Coledia Poole, Student Conduct Coordinator

Candace Agnew, Chancellor's Executive Assistant

Timothy Wombles, CAS Media Producer

Sherry Gerrein, Pierre Laclède Honors College

Dr. Margo-Lea Hurwicz, Assistant Professor

Dr. Keith Stine, Professor

We would also like to thank all the mentors who supervised the research, reviewed abstracts countless times, edited posters, coached oral presenters, and were there when they were needed.

New "I Chose UMSL" Master's Scholarships

URS participants who are graduating soon can contact their advisor and the graduate department of their choosing and ask to be nominated for the new "I Chose UMSL" scholarships. The program provides \$500 to selected UMSL grads who return to pursue their first Master's degree.

Presentations



<i>Anthropology</i>	1
<i>Archaeology</i>	2
<i>Biochemistry and Biotechnology</i>	2
<i>Biology</i>	2
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<i>Chemistry</i>	7
<i>Economics</i>	7
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<i>Literature</i>	8
<i>Physics</i>	8
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<i>Psychology</i>	9

The URS ends at 3:00 pm. Shortly thereafter, there will be a brief closing ceremony in the Millennium Student Center, on the third floor, in Century Room C.

Anthropology



Immigration in South City

Elizabeth Bryan, Anthropology

Mentor: Margo-Lea Hurwicz, PhD

Cahokia's Influence: The Trade of Pottery West of the Mississippi

Anthony Farace, Anthropology

Mentor: Patti Jo Wright, PhD

Evidence of Fighting in Early 19th-Century U.S. Culture

Rachel Indelicato, Anthropology

Mentor: Sarah Lacy, PhD

Modifying Caissons for Nautical Archeology

Alex Leo, Anthropology

Mentor: Margo-Lea Hurwicz, PhD

Feminism Through the Use of Nonverbal Communication

Adam Mann, Anthropology

Mentor: Margo-Lea Hurwicz, PhD

Educational Strategies for Zoo Conservation

Michelle McCormack, Anthropology

Mentor: Margo-Lea Hurwicz, PhD

Archaeology



Historical Inaccuracy in History Channel's Vikings

Courtney Hayden, Archaeology

Mentor: Margo-Lea Hurwicz, PhD

Biochemistry & Biotechnology



Characterization of Novel Cyanobacteria Strains

Rahmah Ghazal, Biochemistry and Biotechnology

Sara Abramowski, Biochemistry and Biotechnology

Erica Nelson, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

Genomic Sequencing and Characterization of the Cyanobacterium *Anabaena* sp. PNB

Christopher Harper, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

Biology



Development of an Effective Immunofluorescence Protocol for *Drosophila melanogaster* Tissue Culture Cells and Embryos

Kaylyn Bauer, Biochemistry and Biotechnology

Mentor: Mindy Steiniger, PhD

Characterization of the Cyanobacteria N2B and Its Potential Use for Biofuel Production

Kaylyn Bauer, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

Simulating Natural Light Environments to Examine Niche Differences in the Federally Endangered *Astragalus bibullatus* & a Widespread Common Congener, *Astragalus crassicarpus* var. *crassicarpus*

Rachel Becknell, Biology

Mentor: Peter Stevens, PhD

Detection of Yellow-crowned Parrot Repertoire Using Human Analysis

Jessica Brown, Biology

Leon P. Moore

Luke A. B. Johnson

Mentor: Godfrey R. Bourne, PhD

Synthetic Anion Transporters Alter *Arabidopsis thaliana* Root Architecture

Evan Garrad, Biology

Mentors: George W. Gokel, PhD; Mohit B. Patel, MS

Malaria Parasites (Order Haemosporida) Infecting Avian Host Populations in Eastern Cuba

Lindsey Gray, Biology

Mentors: Robert Ricklefs, PhD; Leticia Soares, Doctoral Student

**Leaf-Cutter Ant Cast Sizes Are Related to
Leaf Fragment Sizes Transported to Their Nests**

Lauren Kincade, Biology

Mentor: Godfrey R. Bourne, PhD

**Wildlife Crossings: A Strategy for Mitigating Animal and
Vehicle Collisions Along Missouri's Major Roadways**

Christina Leahy, Biology

Mentor: Godfrey R. Bourne, PhD

Chimera States in a Neural Model

Scott Lewis, Biology

Tera Glaze

Kenneth Showalter

Mentor: Sonya Bahar, PhD

Promotion of *nifV* in *Anabaena variabilis*

Kent Morgan, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

Characterization of the 2RC and BAI Cyanobacteria

Kent Morgan, Biochemistry and Biotechnology

Rajesh Dhimal, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

**Investigating the Role of Puf Proteins and miRNAs on
Parkinson's Disease Gene Regulation**

Christine Noto, Biology

Mentor: Wendy Olivas, PhD

Do Galapagos Birds Share Parasites with Their Neighbors?

Sage Rohrer, Biology

Mentors: Patricia Parker, PhD; Mari Cruz Jaramillo, M.Sc.

Interaction of Double Mutants in Indole-3-Butyric Acid Metabolism

Amanda Shurzinske, Biology

Mentor: Bethany Zolman, PhD

Classification of the Cyanobacteria Strains ARAD and FSR

Thomas Smith, Biochemistry and Biotechnology

Abigail Eaker, Biochemistry and Biotechnology

Mentor: Teresa Thiel, PhD

***Arabidopsis thaliana* and the Classification of Peroxisome Mutations**

Marlee Thomas, Biology

Ying Li, Biology

Mentor: Bethany Zolman, PhD

Heliothermic Butterfly Activity, Abundance, and Species Diversity are Highest in the Late Morning and Early Afternoon

Ashley Venker, Biology

Mentor: Godfrey R. Bourne, PhD

Giant Water Lily, *Victoria amazonica*, Size Classes Are Not Related to the Number of Visiting Scarab Beetle, *Cyclocephala hardyi*, Pollinators

Samantha Villiare, Biology

Leon P. Moore

Mentor: Godfrey R. Bourne, PhD

**Third Year of Sampling Suggests That Aquatic
Macroinvertebrate Species and Richness at Karanambu Trust
Indicate Low Water Quality During a Drought**

Brian Waldrop, Biology
Susan George
Kenneth Butler
Leon P. Moore

Mentor: Godfrey R. Bourne, PhD

**Arabidopsis Thaliana ibr3-1 Double Mutants
Provide Insight to IBA to IAA**

Marisa Yoder, Biology
Vanessica Jawahir

Mentor: Bethany Zolman, PhD

**Lizard Species Diversity in an Abnormally Dry Month and
Comparisons with a Month in a Normal Rainfall Year**

Ari Zakroff, Biology
Audwin Anthony

Mentor: Godfrey R. Bourne, PhD

Business Administration



Marketing Gender Roles in the Japanese and American Cultures

Kathryn Bewig, Business Administration

Mentor: Ann Torrusio, MA

Chemistry



In-vitro Screening of Various Compounds for Potential NAD⁺-mediated DNA Ligase Inhibitors

Hyung Park, Chemistry

Mentor: Cynthia M. Dupureur, PhD

Economics



An Econometric Investigation of the Determinants of Public Transportation Use

Brandon Giesege, Economics

Mentor: Anne E. Winkler, PhD

Liberal Studies



Auto Ethnography: Exploration of a Black Mother's Challenge to Save Her Sons

Sharon Williams, Liberal Studies

Mentor: Margo-Lea Hurwicz, PhD

Literature



Flannery O'Connor & Lady Gaga: Unorthodox Catholicism & Subversive Texts

Katryn Dierksen, English

Mentor: Kimberly Baldus, PhD

Physics



Diffraction Effects in Energy-Filtered Electron Mapping of Specimen Thickness

Brigid Costello, Physics

Mentor: Phillip Fraundorf, PhD

Ice Abundances in Comet C/2002 T7

Warren Li, Physics

Mentor: Erika Gibb, PhD

Investigation of Electrode Materials in Lithium-ion Batteries: Improving Capacity and Cycling Performance

Alyssa McFarlane, Physics

Mentor: Eric H. Majzoub, PhD

Real Time Sheet Music

Stephen Wedekind, Physics

Mentor: Phillip Fraundorf, PhD

Accretion in Young Stellar Objects

Matthew Wentzel, Physics

Mentor: Bruce Wilking, PhD

Political Science



Effects of Economic Perception on Voter Turnout

Hagen Montano, Economics

Mentor: David C. Kimball, PhD

Policy Innovation and the Dynamic Court

Devon Roberson, Public Policy and Administration

Mentor: Richard Middleton, PhD, JD

Psychology



Fathers' Occupation and Sense of Belonging Predict Personal Outcomes among Women in STEM

Jordan Farhat, Biochemistry and Biotechnology

Mentor: Bettina Casad, PhD

**The Role of Perceived Difficulty in
Women's Commitment to Science**

Heather Chiang, Psychology
Richard Currie, Psychology
Bradley Morlock, Psychology

Mentor: Bettina Casad, PhD

**The Effects of Previous Childhood Sexual Assault and
Current PTSD Status on Heart Rate Reactivity
During Interpersonal Trauma Cues**

Meg Cloud, Psychology
Rebecca Delgado, BS
Brittany Preston, MA

Mentor: Michael Griffin, PhD

**Orthographic-Phonographic Integration
in Adults with Varying Reading Skill**

Sarah Gill, Liberal Studies

Mentor: Suzanne Welcome, PhD

**Dehydroepiandrosterone Anxiety Effects
on Older Adult Male Rats**

Gina Hart, Nursing
Meg Cloud, Psychology
Jamie Gunn, Psychology
Brittany Preston, BA

Mentor: George Taylor, PhD

Implicit and Explicit Alcohol Attitudes

Veronica High, Psychology

Mentor: Jeffrey Noel, PhD

Self-Efficacy Mediates Effects of Stereotype Threat on Academic Outcomes

Lauren Kanyuck, Psychology
Evan Blechle, Psychology
Sarah Mitchell, Psychology

Mentor: Bettina Casad, PhD

The Effect of Emotional Stimuli on Stomach Contractions

Amanda Lococo, Psychology

Mentor: Sandra Langeslag, PhD

Observations on Environmental Accuracy of Lucidly Dreamed Content

Remington Mallett, Psychology

Mentor: Suzanne Welcome, PhD

Event-Related Potentials Associated with Word Prediction During Reading

Kaitlyn May, Psychology
Katy Fox, Biology

Mentor: Suzanne Welcome, PhD

Distracting Effect of Beloved-Related Information on Working Memory

Kaylyn Moore, Psychology

Mentor: Sandra Langeslag, PhD

Changes in Distress as a Mediator Between Guilt Cognitions and PTSD in Treatment of Trauma Survivors

Cameron Richter, Psychology

Mentor: Tara E. Galovski, PhD

Complex Trauma Exposure in Children: Investigating a Dimensional Conceptualization and Perpetrator Attachment

Cazzie Steinzor, Psychology

Mentors: Jerry H. Dunn, PhD; Rachel Ann Wamser-Nanney, PhD

Regulation of Love Feelings

Kruti Surti, Psychology

Mentor: Sandra Langeslag, PhD

Can You Raed This: A Study of Orthographic Priming

Emma Trammel, Psychology

Mentor: Suzanne Welcome, PhD

Early Life Stress, Depression, and Cognitive Ability in Adults with Congenital Heart Disease

Brian Wilkinson, Psychology

Mentor: Kamila S. White, PhD

How Power Poses Affect Self-Efficacy and Sexual Interest

Kristen Woodhall, Psychology

Mentors: Jennifer Siciliani, PhD; Margo-Lea Hurwicz, PhD