

3rd Annual Undergraduate Research Symposium

April 21, 2009

SESSION I.A FOOD AND THE FUTURE

Memorial Union, Room 3505

9:00 - 10:20 am

Moderator: Brian Hornbuckle, Dept. of Agronomy

- I.A.1 **The Alkamide Stability of Echinacea Angustifolia Extracts with and without Phenolic Acids**
WANCHIN LIM, Food Science and Technology, College of Human Sciences (Mentor: Patricia Murphy)
- I.A.2 **Supplemental LED Lighting in Soybean Canopies**
CAROL FAULHABER, Agricultural Engineering, College of Engineering; TYLER SWENSON, Mechanical Engineering, College of Engineering; BRANDON WILSON, Agronomy and Agricultural Education, College of Agriculture and Life Sciences (Mentor: Amy Kaleita)
- I.A.3 **Identification of QTL Regulating Cob Length and Diameter for Heterosis in Maize**
UYEN PHAM, Genetics and Microbiology, College of Liberal Arts and Sciences & Agriculture and Life Sciences (Mentor: Patrick Schnable)
- I.A.4 **Effectiveness of Extended-duration Row Covers for Suppression of Bacterial Wilt in Muskmelon**
ALICIA OWENS, Biology and Environmental Studies, College of Liberal Arts and Sciences (Mentor: Mark Gleason)

SESSION I.B ANIMAL SCIENCE AND AGRICULTURE

Memorial Union, Room 3512

9:00 - 10:20 am

Moderator: Leo Timms, Dept. of Animal Science

- I.B.1 **Application of Methods to Standardize the Comparison of Milk Composition Between Jersey and Holstein Cattle**
AMY MAXWELL, Agricultural Business, College of Agriculture and Life Sciences (Mentor: P. Jeffery Berger)
- I.B.2 **Diurnal Resting Habitat Selection of the White-tailed Jackrabbit in an Intensive Agricultural**
ERIC KILBURG, Animal Ecology, College of Agriculture and Life Sciences (Mentor: W. Sue Fairbanks)
- I.B.3 **Application of Energy Corrected Milk to Evaluate Phenotypic, Genotypic and Environmental traits in Milk Composition for Dairy Cattle**
ERICH HODGES, Dairy Science Pre-Vet and Animal Science Pre-Vet, College of Agriculture and Life Sciences (Mentor: P. Jeffrey Berger)
- I.B.4 **Seed Dispersal of Native and Non-native Prairie Plants by Bison**
EMILY ARTZ, Animal Ecology, College of Agriculture and Life Sciences (Mentor: W. Sue Fairbanks)

SESSION I.C MECHANICAL AND COMPUTER ENGINEERING

Memorial Union, Room 3219

9:00 - 10:20 am

Moderator: Michael Olsen, Dept. of Mechanical Engineering

- I.C.1 **The use of Particle Swarm Optimization and Computer Simulations to Improve Diesel Engine Performance**
NOAH VAN DAM, Mechanical Engineering, College of Engineering (Mentor: Song-Charng Kong)
- I.C.2 **Lateral Vibration in Magnetic Tape Transport**
CARL KIRPES, Mechanical Engineering and Industrial Engineering, College of Engineering (Mentor: Jonathan Wickert)
- I.C.3 **Exploring Software Defined Ratio**
BEN GREEN, Computer Engineering, College of Engineering (Mentor: Aditya Ramamoorthy)
- I.C.4 **Micro-extrusion of Metals with Ultra-sonic Vibration**
ADAM FOSTER, Mechanical Engineering and Spanish, College of Engineering & Liberal Arts and Sciences (Mentor: Gap-Yong Kim)

SESSION I.D WEATHER AND WATER

Memorial Union, Room 3538

9:00 - 10:20 am

Moderator: Gene Takle, Dept. of Geological and Atmospheric Sciences

- I.D.1 **Visualization Tool to Aid in the Decision Making Process Related to the Complex Relationships in Soil Moisture**
JOE GOERING, Mechanical Engineering, College of Engineering; KRISTIN CRAWFORD, Aerospace Engineering, College of Engineering; STEPHANIE KAPHINGST, Mechanical Engineering, College of Engineering (Mentors: Amy Kaleita & Eliot Winer)
- I.D.2 **Temperature, Water-Level, and Chemical Evidence for Flood Water Entering the Ames Aquifer**
RACHEL SCHEURER, Environmental Engineering, College of Engineering (Mentor: William Simpkins)
- I.D.3 **A Climatology of Severe Convective Events as a Function of Storm Morphology**
JEFF DUDA, Meteorology and Mathematics, College of Liberal Arts and Sciences (Mentor: William Gallus)
- I.D.4 **Using Remote Sensing Data to Evaluate Wetland Habitat Loss in the Mobile, Galveston, and Tampa Bay Watersheds**
MORGAN STEFFEN, Biology, College of Liberal Arts and Sciences (Mentor: John Downing)

SESSION I.E PEOPLE, PLANTS AND THE ENVIRONMENT

Memorial Union, Room 3558

9:00 - 10:20 am

Moderator: Kathleen Delate, Dept. of Horticulture

- I.E.1 **Genome Rearrangements Induced by Transposable Elements in Maize**
DILSHAN HARISCHANDRA, Genetics, College of Agriculture and Life Sciences (Mentor: Thomas Peterson)
- I.E.2 **Continuous Productive Urban Landscapes: A Sustainable Design Option to Growing Urban Communities in Iowa**
JASON GRIMM, Landscape Architecture and Environmental Studies, College of Design (Mentor: Mimi Wagner)
- I.E.3 **A Failure of U.S. Intervention: Environmental and Social Effects of Crop Fumigation in Colombia**
MONICA PETERSON, Political Science and Environmental Studies, College of Liberal Arts and Sciences (Mentor: Maximilian Viatori)
- I.E.4 **Soil Temperature and Moisture Effect on *M. x giganteus*' meristem Growth**

BRIAN PFEIFFER, Agronomy, College of Agriculture and Life Sciences (Mentor: Emily Heaton)

SESSION II.A PHYSICS AND METEOROLOGY

Memorial Union, Room 3505

10:40 - 12:00

Moderator: Craig Ogilvie, Dept. of Physics and Astronomy

- II.A.1 **Exploration of Superparamagnetic Iron Oxides for Wide Frequency, High Temperature**
DANIEL STOECKLEIN, Physics, College of Liberal Arts and Sciences (Mentor: Ruslan Prozorov)
- II.A.2 **High Speed Electronics Testing for PHENIX Muon Detector Forward Trigger Upgrade**
ANDY GOERS, Physics and Math, College of Liberal Arts and Sciences (Mentor: John Lajoie)
- II.A.3 **Convective Heat Transfer and Instability in a Wind Tunnel**
MICHAEL PETERSON, Meteorology and Spanish, College of Liberal Arts and Sciences (Mentor: Tom Sauer)

SESSION II.B AEROSPACE AND MATERIALS ENGINEERING

Memorial Union, Room 3512

10:40 - 12:00

Moderator: Ralph Napolitano, Dept. of Materials Science & Engineering

- II.B.1 **The Effect of Strengtheners of Polymer Composites**
BRIAN RICHARD, Aerospace, College of Engineering; JOSHUA LEONARD, Aerospace, College of Engineering (Mentor: Amy Kaleita)
- II.B.2 **Corrosive Properties of Titanium and Cobalt Chromium Implant Alloys: Analysis of Native Oxide Layer and Open-Circuit Potential**
JORDAN TRACHTENBERG, Materials Engineering and French, College of Engineering (Mentor: Pranav Shrotriya)
- II.B.3 **Characterization of Magnesium Glass Electrolytes for Magnesium Batteries**
SETH BERBANO, Materials Engineering, College of Engineering (Mentor: Steve W. Martin)
- II.B.4 **The Mixed Glass Former Effect in the Na₂O+B₂O₃+P₂O₅ Glass System**
JENNIFER BYER, Materials Engineering, College of Engineering (Mentor: Steve Martin)

SESSION II.C CONFLICT AND POLICY

Memorial Union, Room 3219

10:40 - 12:00

Moderator: David Cunningham, Dept. of Political Science

- II.C.1 **American Study Abroad Students: A Correlation Between the Student's Adjustment and Perception of Social Support**
BYRON CEASAR, Psychology, College of Liberal Arts and Sciences (Mentor: Meifen Wei)
- II.C.2 **Analysis of Terrorism in Ireland and the United Kingdom during the 20th Century**
SEAN LYNCH, Criminal Justice and Criminology, College of Liberal Arts and Sciences (Mentor: LTC Jay Soupene)
- II.C.3 **Rhetorical Use of Hannibal Barca in Ancient Rome**
NICHOLAS DIAL, History and Political Science, College of Liberal Arts and Sciences (Mentor: David Hollander)
- II.C.4 **Divided Minorities Struggling for Autonomy**
MICHAEL KOSTBOTH, Political Science, College of Liberal Arts and Sciences (Mentor: Kathleen Cunningham)

SESSION II.D GENETICS, BIOLOGY AND BIOPHYSICS

Memorial Union, Room 3538

10:40 - 12:00

Moderator: M Duane Enger, Dept. of Genetics, Development and Cell Biology

- II.D.1 **Structure-Function Relations of the Nucleotide-Binding Proteins of Osmoregulatory ABC Transporters**
TEPPEI SHIRAKURA, Biophysics, College of Liberal Arts and Sciences (Mentor: Edward Yu)
- II.D.2 **Spontaneous Calcium Activity in Differentiating Adult Rat Hippocampal Progenitor Cells**
WILLIAM LAW, Genetics, College of Liberal Arts and Sciences; JOHN CALLAHAN, Biology, College of Liberal Arts and Sciences (Mentor: Don Sakaguchi)
- II.D.3 **Crystal Structure and Role of Transcriptional Repressor AcrR from Escherichia Coli**
KAELYNN KOCH, Physics, College of Liberal Arts and Sciences (Mentor: Edward Yu)
- II.D.4 **Characterization of Multipotent Adult Rat Hippocampal Progenitor Cells Maintained as Neurospheres**
GABRIELLE DANIELS, Biology, College of Liberal Arts and Sciences (Mentors: Donald Sakaguchi & Jisun Oh)

SESSION II.E PSYCHOLOGY: ATTITUDES AND BELIEFS

Memorial Union, Room 3558

10:40 - 12:00

Moderator: Stephanie Madon, Dept. of Psychology

- II.E.1 **Changing Binge-drinking Cognitions: The Impact of Mode of Processing, Comparison Targets and Past Behavior**
MIKO WILFORD, Psychology and Political Science, College of Liberal Arts and Sciences (Mentor: Michelle Stock)
- II.E.2 **The Effects of Religiosity on Student Well-Being and Academic Performance**
DIONNE TRUMBO, Psychology and Spanish, College of Liberal Arts and Sciences (Mentor: Carolyn Cutrona)
- II.E.3 **Cognitive Strategies Used by Triathletes to Get Through the Pain**
THOMAS MAZULA, Accounting and Psychology, College of Business & Liberal Arts and Sciences (Mentor: Zlatan Krizan)
- II.E.4 **The Accumulation of Self Fulfilling Effects as Demonstrated through Social Stereotypes**
OZIOMA OJI, Psychology, College of Liberal Arts and Sciences (Mentor: Stephanie Madon)

SESSION III.A BIOLOGY, BIOCHEMISTRY AND GENETICS

Memorial Union, Room 3505

1:30 - 3:00 pm

Moderator: David Oliver, College of Liberal Arts & Sciences

III.A.1 Structural Characterizations of the Ebola VP35 Proteins

MINA FARAHBAKHSI, Biochemistry, College of Liberal Arts and Sciences; LUKE HELGESON, Biochemistry, College of Liberal Arts and Sciences (Mentor: Gaya Amarasinghe)

III.A.2 Examining Different Forces in the Hamstrings and How They Compare During Walking, Sprinting, and Hurdling

ISAAC HINTON, Biology, College of Liberal Arts and Sciences & Human Sciences (Mentor: Tim Derrick)

III.A.3 The Role of Mammalian Orthoreovirus in Stress Granule Formation

KATE KREGER, Genetics, College of Agriculture and Life Sciences (Mentor: Cathy Miller)

III.A.4 Cytotoxicity with Ethanol of Various Species and Accession of Hypericum

ANGELA NGUYEN, Biology, College of Liberal Arts and Sciences (Mentor: Diane Birt)

SESSION III.B DESIGN AND PLACE

Memorial Union, Room 3512

1:30 - 3:00 pm

Moderator: Mark Chidister, Dept. of Art & Design

III.B.1 In Focus: The Beauty of ISU Architecture

SHANNON SCHAEFER, Art and Design, College of Design (Mentor: Barbara Caldwell)

III.B.2 Studying Medical Decision Aids

BECKY MURPHY, Graphic Design, College of Design; GINA ASSMANN, Interior Design, College of Design; MELISSA DILLING, Graphic Design, College of Design (Mentors: Debra Satterfield & Sung Kang)

III.B.3 Furniture Art

ANDREW KOPP, Integrated Studio Arts and Management, College of Design & Business (Mentors: Mark Chidister & Chris Martin)

III.B.4 Sustainability and Packaging

MELISSA GASWAY, Graphic Design and Marketing, College of Design & Business (Mentor: Debra Satterfield)

SESSION III.C ANIMAL AND HUMAN DISEASE

Memorial Union, Room 3219

1:30 - 3:00 pm

Moderator: Mark Ackermann, Dept. of Veterinary Pathology

III.C.1 Evaluation of Mycoplasma Hypopneumoniae Recombinant Proteins by Western Blot

LEANNE SCHULZ, Biology, College of Liberal Arts and Sciences (Mentor: Chris Minion)

III.C.2 Evolutionary Similarities between Avian and Human Extraintestinal Pathogenic Escherichia coli Using MLST

KATHY MOU, Animal Science, College of Agriculture and Life Sciences (Mentor: Lisa Nolan)

III.C.3 Transcriptome Analysis of Altered Satellite Growth Phenotypes of Mycoplasma Pneumoniae

ANDREW PETERSEN, Microbiology, College of Agriculture and Life Sciences (Mentor: Chris Minion)

III.C.4 Evaluation of the Effect of Airway Hypersensitization on the Immune Response to Mycoplasma Hypopneumoniae

ELIZABETH RASH, Biology and Pre-Veterinary Medicine, College of Agriculture and Life Sciences (Mentor: Erin Strait)

SESSION III.D IMAGE AND PERCEPTION

Memorial Union, Room 3538

1:30 - 3:00 pm

Moderator: Dawn Sweet, Dept. of Psychology

III.D.1 A Man's Survival Guide to Getting Married

CLIFF DOLBEARE, Agriculture Education, Communications, College of Agriculture and Life Sciences
(Mentor: Diane Bugeja)

III.D.2 Exploring the Portrayal of Black Women and their Sexuality in Romance Novels

BRIONNI MCGRIFF, Political Science, Sociology and International Studies, College of Liberal Arts and Sciences (Mentor: Anastacia Prokos)

III.D.3 The College Girl: A Content Analysis of the Ideal as Portrayed in Mademoiselle, 1950-1959

EMILY BISHOP, Journalism and Mass Communication, College of Liberal Arts and Sciences (Mentor: Sara Marcketti)

III.D.4 Does Feeling Happy or Sad Influence Brand Judgments?

PAIGE MCQUEENEY, Marketing and Advertising, College of Business & Liberal Arts and Sciences
(Mentor: Laura Smarandescu)

SESSION III.E CHEMICAL & BIOLOGICAL ENGINEERING, BIOCHEMISTRY AND LANGUAGE

Memorial Union, Room 3558

1:30 - 3:00 pm

Moderator: Eric Cochran, Dept. of Chemical & Biological Engineering

III.E.1 Comparative Sequence Analysis of the Bovine Prion and Doppel Genes

ALLISON HANNEN, Agricultural Biochemistry, College of Agriculture and Life Sciences (Mentor: Don Beitz)

III.E.2 Optimum Checkerboard Selection for Structured Light System Calibration

WILLIAM LOHRY, Chemical Engineering, College of Engineering (Mentor: Song Zhang)

III.E.3 Alkaloid Extraction and Purification from Catharanthus Roseus Hairy Root Tissue

DIANE BROWN, Chemical Engineering, College of Engineering (Mentor: Jacqueline Shanks)

III.E.4 College Age Non-Hispanic women and Their Attitudes towards English Being Declared the Official language of the United States

CHAVEL ARON, Spanish and International Studies, College of Liberal Arts and Sciences (Mentor: Nana Osei-Kofi)