3rd ANNUAL
Undergraduate Research Symposium
Welcome to Iowa State University’s Third Annual Undergraduate Research Symposium! The Symposium provides undergraduates from all academic disciplines, both Honors and non-Honors students, with the opportunity to share their research with the university community and other guests through oral presentations. The Symposium represents part of a larger effort of Iowa State University and the University Honors Program to enhance, support, and celebrate undergraduate research activity.

The 74 students involved in this year’s Symposium cover a broad range of the types of research and creative endeavors conducted on campus. These undergraduates and their mentors represent all eight of the Colleges at ISU: Agriculture & Life Sciences, Business, Design, Engineering, Graduate, Human Sciences, Liberal Arts & Sciences, and Veterinary Medicine.

We hope that you enjoy the day!

Dana Schumacher  
Symposium Coordinator  
Asst. Director for Undergraduate Scholarship & Research

Susan Yager  
Faculty Director

Laurie Fiegel  
Administrative Director

University Honors Program, 2130 Jischke Building,  
Iowa State University, Ames IA 50011-1150
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<th>Time</th>
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<td>8:00-8:30 am</td>
<td>Registration and Refreshments</td>
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<td>8:30-9:00 am</td>
<td>Opening Remarks by David Holger, Associate Provost</td>
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<td>Pioneer Room, Memorial Union</td>
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<td>9:00-10:20 am</td>
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<td>IE - People, Plants and the Environment</td>
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<td>Memorial Union, Room 3558</td>
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<td>10:20-10:40 am</td>
<td>Break and Refreshments, featuring 2009 FOCUS Grant exhibit and artists</td>
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<td>10:40 am-12:00 noon</td>
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<td>ID - Genetics, Biology and Biophysics</td>
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<td>IE - Psychology: Attitudes and Beliefs</td>
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<td>12:00-1:30 pm</td>
<td>Luncheon for presenters, research mentors and invited guests with...</td>
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<td>remarks by Gail Nonnecke, University Professor of Horticulture</td>
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<td>IE - Chemical &amp; Biological Engineering, Biochemistry and Language</td>
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PROGRAM—Session I

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 setting
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 SCHEUERER, 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)

BREAK & REFRESHMENTS
FEATUREING 2009 FOCUS GRANT EXHIBIT & ARTISTS
Memorial Union, Pioneer Room  10:20 - 10:40 am

FOCUS is an annual celebration of the arts in which the Lectures Program, funded by the Government of the Student Body, awards grants for creative projects in the visual and performing arts proposed by Iowa State students. FOCUS aims to encourage and reward the artistic endeavors of all Iowa State students, regardless of their academic focus. Several of the undergraduate students who received 2008-09 FOCUS grants are present to talk with the Symposium audience about their works:

- Mosaic of Memory  Time in Eastern Europe
  Maureen Burke, Integrated Studio Arts  Jon Lemons, Integrated Studio Arts
  Project Advisor: Ingrid Lilligren  Project Advisor: Dennis Chamberlin

- Dharma Punkz  Experiencing Environments
  Jonathan Happ, Integrated Studio Arts  Brian Nagel, Fine Arts
  Project Advisor: Barbara Walton  Project Advisor: April Katz

- Non-Traditional Percussion  Not a Friend in the World
  Daniel Kelly, Operation & Supply Chain Management  Michael Schneider, Psychology
  Project Advisor: Barry Larkin  Project Advisor: Taryn Packheiser

- Figural Bust Series  Farmboys
  Trevor Knott, Integrated Studio Arts  Christian VandeHaar, Integrated Studio Arts
  Project Advisor: Ingrid Lilligren  Project Advisor: Brent Holland
PROGRAM—Session II

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 Applications
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 Soupe) disparity
II.C.3 Rhetorical Use of Hannibal Barca in Ancient Rome
NICHOLAS DJAL, 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
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
KAELLYNN 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 FARAHBAKHSH, 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
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 Hyopneumoniae 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 Hyopneumoniae
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 Marcetti)

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)
The Alkamide Stability of Echinacea Angustifolia Extracts with and without Phenolic Acids
WanChin Lim (Session I.A.1)
Alkamides are unsaturated fatty acid amides that may contribute to the health benefits associated with Echinacea species. Alkamide stability of Echinacea angustifolia extracts was studied under accelerated storage stability at three temperatures. E.angustifolia extracts with and without phenolic acids are stored at 70, 80, 90°C to determine the rate of degradation of alkamides and their stability half-lives. Alkamides degraded faster in phenolic− poor E.angustifolia extracts than in phenolic-rich. The phenolic acids appear to act as antioxidants. The overall orders of degradation rate of alkamides and two new ketones was alkamide 9>1′>2>8>11>6>3>10>5>4>7>15>13>17>12>Ketone 22>Ketone 24.Ketone 14.

Supplemental LED Lighting in Soybean Canopies
Carol Faulhaber; Tyler Swenson; Brandon Wilson (Session I.A.2)
One constraint in space missions is the requirement for food and water. Therefore, developing the technologies to grow plants in space would be advantageous. To maximize plant yields in space, the use of efficient lighting is important. One crop that has been targeted for growth in manned space missions is soybeans. Overhead lighting setups provide light to the top of a soybean's canopy; however, light does not reach the bottom of the canopy inhibiting plant growth. To optimize lighting efficiency and plant yields, Light Emitting Diodes (LEDs) will be tested as a supplemental light source in closed-canopy soybean production. Vinton 81 soybean plants will be grown in 2 square meter plots with fluorescent lamps overhead and blue and red LEDs placed between rows. A control plot with only overhead lighting will be used for comparison. The Photosynthetic Active Radiation (PAR) and Leaf Area Index (LAI) will be measured weekly for both plant systems. At maturity grain yield will be measured for both plots. It is hypothesized that LED lights will increase grain yields to a point where the benefits will outweigh the additional energy consumption.

Identification of QTL Regulating Cob Length and Diameter for Heterosis in Maize
Uyen Pham (Session I.A.3)
Although heterosis (hybrid vigor) is widely exploited, we have limited understanding about the mechanisms responsible for it. Maize is a convenient model to study hybrid vigor. The inbred lines B73 and Mo17 produce hybrids that exhibit heterosis for many traits. These inbred lines are the parents of the IBM population of Recombinant Inbred Lines (RILs). To identify the gene regions responsible for cob length heterosis and diameter, we conducted a Quantitative Trait Locus (QTL) experiment, including 291 IBM RILs and their crosses with B73 and Mo17. We crossed the RILs to the parent lines so we could compare homozygous and heterozygous loci. We had a large sample population of the parent lines to give an accurate measure of heterosis in the hybrid genotypes. Maximum cob length and diameter data were collected using a digital caliper from multiple plants per genotype (three replications containing five plants per genotype per replication). We calculated mid-parent heterosis and high-parent heterosis and ran separate QTL analyses for each method. Using these different measures of heterosis as well as the cob length and diameter per se, QTL mapping was conducted using a genetic map containing 1,016 SNP-based genetic markers. Significant QTL were identified and will be discussed.
**Effectiveness of Extended-duration Row Covers for Suppression of Bacterial Wilt in Muskmelon**  
Alicia Owens (Session I.A.4)

Field studies in Gilbert (2007 and 2008) and Muscatine, Iowa (2008) tested effectiveness of extended-duration row covers for suppressing bacterial wilt of muskmelon throughout the growing season. Experimental design was a randomized complete block with four treatments and four replications. Each replication consisted of a row of 15 plants with 2 ft. spacing. Treatments included 1) no row cover; 2) row covers removed at anthesis; 3) row covers removed 10 days after anthesis, but ends opened at anthesis to allow pollination; 4) row covers removed 10 days after anthesis, with bumble bee hives enclosed under row cover ends at anthesis to provide pollination. Beginning 10 days after anthesis and continuing until harvest, plants were assessed weekly for wilt symptoms. At Gilbert in 2007 and Muscatine in 2008, all row cover treatments had significantly lower wilt incidence early in the season, but only extended-duration row cover treatments suppressed wilt all season. At Gilbert in 2008, all row covers greatly suppressed bacterial wilt. However, no differences were evident between traditional and extended-duration row covers. Differences in effectiveness of row covers may be linked to timing of transplanting.

**Application of Methods to Standardize the Comparison of Milk Composition Between Jersey and Holstein Cattle**  
Amy Maxwell (Session I.B.1)

The fat corrected milk formula has been used since the early 1920s. The relationship between energy value and composition for cow’s milk formulas for energy corrected milk has been known since Tyrrell and Reid (1965). In general, the formulas convert yield of milk, fat, and protein to an energy constant basis per kilogram. More recently, lactose has received attention as an additional component of milk. Lactose has proven to be worthy of inclusion in the formula for conversion to an energy constant basis. This research focuses on the conversion of national US averages for milk, fat, and protein yields from 2000 to 2008 to an energy constant basis. Trends in milk, fat, and protein yields are compared for Jersey and Holstein breeds.

**Diurnal Resting Habitat Selection of the White-tailed Jackrabbit in an Intensive Agricultural Landscape**  
Eric Kilburg (Session I.B.2)

Steady declines in the population of white-tailed jackrabbits in Iowa since the mid 1900s, have highlighted the need to collect data on this largely unstudied Species of Greatest Conservation Need. Found throughout much of the northern Great Plains, the white-tailed jackrabbit requires large, open areas to avoid predation during nightly foraging and daytime resting. Continuous expansion of large-scale agriculture potentially limits the availability of that required niche and may be causing population declines. I am conducting a study of jackrabbit preferences for daytime resting habitat in relation to seasonal and agricultural changes on an intensively farmed landscape. To date, we have captured and fitted radio-collars on 8 jackrabbits on an ISU research farm. I track each radio-collared animal to its resting location at a random time during the day, record vegetation type and height and visibility from the resting site. Corresponding data is collected at 2 reference sites to allow comparison between habitat used by jackrabbits versus habitat available. Knowledge of jackrabbit preferences for resting sites throughout the year will provide information needed to develop a management plan for this declining species, as well as baseline data for comparison to landscape-level changes associated with agriculture and the global climate.
**Application of Energy Corrected Milk to Evaluate Phenotypic, Genotypic and Environmental traits in Milk Composition for Dairy Cattle**

Erich Hodges (Session I.B.3)

The role of lactose in milk production has not been completely emphasized in the processing and purchase weight of milk. Several objectives of this project include: determining environmental factors that contribute to Energy Corrected Milk (ECM), utilizing a glucose tolerance test in heifers to predict ECM (including lactose) production as a mature animal, formulating the proper diet for a dairy cow to maximize its genetic ECM potential, and diagnosing the role of lactose in calculating ECM and its monetary worth. Data available for this research are national breed average milk records for milk, fat, and protein yields from 1963 to 2006. Formulas for converting yield to an energy constant have been available since the early 1930s. The recent addition of lactose has been included as an unclear additional energy source in fluid milk. The findings of the role of lactose as an energy source will be discussed and elaborated in detail, along with its importance in product manufacturing.

**Seed Dispersal of Native and Non-native Prairie Plants by Bison**

Emily Artz (Session I.B.4)

One of the main challenges of prairie restoration is the control of non-native plant species. This study focuses on epizoochory, seed transport in animal fur, by bison in a large restored prairie, the Neal Smith National Wildlife Refuge. This research examines the percentage of native to non-native seeds transported by the bison on the refuge, and correlates the types of seeds carried with various environment types in the study area. We will examine the relationship between the areas frequented by bison and the plants which grow there, and the location and types of seed found in the bison’s fur. Samples of shed bison hair were collected from a range of locations, recorded by GPS. Seeds will be extracted from the hair samples and identified. We will compare the locations of the parent plants and the seed-bearing hair samples in order to determine the differences in the epizoochory of native and non-native plant species. This data will indicate to what extent native and non-native plant species are dependent on animal vectors, and in what areas bison are most likely to pick up seeds in their fur. Further research may allow us to establish planting guidelines to help native plant species take advantage of epizoochorous dispersal.

**The use of Particle Swarm Optimization and Computer Simulations to Improve Diesel Engine Performance**

Noah Van Dam (Session I.C.1)

Much effort has gone into improving the performance of internal combustion engines. Most of these studies used a variety of methods to explore different operating conditions to maximize engine performance or minimize emissions. The Particle Swarm technique is an optimization algorithm that is robust to the complicated relationships in engine control parameters and can quickly find optimal operating conditions. Previous work has been done with experimental engine testing, and the results showed the usefulness of the technique as applied to engine optimization. Here the mathematical technique has been coupled to a three dimensional numerical simulation of diesel combustion to increase the speed and flexibility of the search for optimal operating conditions.

**Lateral Vibration in Magnetic Tape Transport**

Carl Kirpes (Session I.C.2)

Magnetic tape data storage is a method of data storage that has been used for over 50 years. When large amounts of data need to be stored tape can be significantly less expensive than other forms of data storage. Magnetic tape data storage has traditionally been used to back up and archive data. Information
is written to and read from the tape as it travels through the tape path. As the tape travels between the supply pack and the take up pack it vibrates in the lateral direction. This vibration reduces the density of the information that can be written to the tape. In studying the Lateral Vibration in Magnetic Tape Transport we are working to measure, simulate, and dampen this vibration. When the vibrations are dampened the density of the information that can be written to the tape will increase and more data will be stored on less tape.

Exploring Software Defined Ratio
Ben Green (Session I.C.3)

With the constant increase in computer power, RF technology that was originally restricted to hardware can now be implemented with the flexibility and convenience of software. Software defined radio has the potential to ease development and costs of wireless communication systems, as well as opening up new possibilities difficult to achieve with hardware. Applications and limitations of this method are explored and tested using the Universal Software Radio Peripheral to receive and transmit data, and GNU Radio software for signal processing. Ultimately the knowledge gained from this research may lead to experimentation with cognitive radio or other technologies to improve the efficiency and capabilities of wireless networks.

Micro-extrusion of Metals with Ultra-sonic Vibration
Adam Foster (Session I.C.4)

As an undergraduate research assistant, I have been involved in the design of the testing platform, the preliminary testing, the proving of the concept, and initial analysis of results for micro-extrusion of metals using ultrasonic-vibration. I have worked closely with many design tools such as Computer Aided Design programs, application of tolerance techniques, assembly of basic mechanism involving mechanical and electrical sub-systems, and direct communication with vendors. A recent push for the miniaturization of macro-scale machining process has motivated the research in the field of micro-extrusion. We are initially testing the effect of the presence of ultrasonic vibration by running trials with and without the vibration. We will analyze the force required for extrusion, the flow stress of the material, and the resulting microstructure of the extruded piece while using ultrasonic vibration, and compare the results with those that do not employ vibration. If the project proves to be successful, it will be the first step towards creating a micro-scale machining process that employs magnetostrictive materials to provide force along with ultra-sonic vibration.

Visualization Tool to Aid in the Decision Making Process Related to the Complex Relationships in Soil Moisture
Joe Goering; Kristin Crawford; Stephanie Kaphingst (Session I.D.1)

With water a precious resource, it is important to understand factors affecting soil moisture. Current research focuses on understanding this relationship; unfortunately these methods are specialized in their applications or overwhelm the user with information making correlations difficult to comprehend. Often, numerical results provide understanding of prominent correlations but miss subtle relationships, hindering subsequent decisions. This project aims to develop a decision making tool combining numerical analysis with visualization techniques providing the user with the information to analyze soil moisture's spatial and temporal variability. Current work has shown that self-organizing maps are effective for displaying comprehensible relationships to the user.
Temperature, Water-Level, and Chemical Evidence for Flood Water Entering the Ames Aquifer
Rachel Scheurer (Session I.D.2)

Seven monitoring wells were installed in August 2008 to investigate the interaction of the South Skunk River and the sand and gravel aquifer at River Valley Park in Ames. Integrated pressure transducer/dataloggers were installed near the bottom of each well (8 to 97 ft) to record hydraulic head and temperature variations. Data show that this is a losing reach to groundwater. Temperature, isotope, and nitrate concentration data suggest that river water penetrates only the upper part of the aquifer. Temperatures of 16 to 20 degrees C down to 42 ft may represent the May 2008 flood event. Data from wells at 69 and 97 ft suggest that groundwater there is not in hydraulic communication with the river. Data from this study will be used to help calibrate a 3-D groundwater model of the Ames aquifer.

A Climatology of Severe Convective Events as a Function of Storm Morphology
Jeff Duda (Session I.D.3)

It is important for operational meteorologists to be able to expect a certain type of severe weather when analyzing radar and other data while issuing severe weather warnings for their area. This expectation can increase forecast skill and save property and lives by giving those in the path of severe thunderstorms adequate time to prepare for their onslaught. This research expands that of Gallus et al. (2008) (hereafter, G08), in which radar data were used to classify thunderstorm events (systems) according to their visual appearance on radar. Severe weather reports associated with individual events were also counted to determine the types of severe weather each type of event produces. This research uses a different period of study and incorporates supercell thunderstorms as a type of system, but uses the same rules as in G08 for classifying systems. Supercells were classified using a product called the Mesocyclone Detection Algorithm. This study tests two hypotheses: 1) that the systems in the G08 study exhibit the same trends as those in the current study; and 2) that supercell systems produce more frequent and more violent severe weather. The results of this study confirm both hypotheses.

Using Remote Sensing Data to Evaluate Wetland Habitat Loss in the Mobile, Galveston, and Tampa Bay Watersheds
Morgan Steffen (Session I.D.4)

The Gulf of Mexico has experienced dramatic wetland habitat area losses over the last two centuries. These losses not only damage species diversity, but contribute to water quality issues, flood control, and aspects of the Gulf coast economy. Overall wetland losses since the 1950s were examined using land cover land use (LCLU) change analysis in three Gulf coast watershed regions: Mobile Bay, Galveston Bay, and Tampa Bay. Two primary causes of this loss, LCLU change and climate change, were then assessed using LCLU maps, U.S. census population data, and available current and historical climate data from NOAA. Sea level rise, precipitation, and temperature effects were addressed, with emphasis on analysis of the effects of sea level rise on salt marsh degradation. Ecological impacts of wetland loss, including fishery depletion, eutrophication, and hypoxia were addressed using existing literature and data available from NOAA. These ecological consequences in turn have had an affect on the Gulf coast economy, which was analyzed using fishery data and addressing public health impacts of changes in the environment caused by wetland habitat loss. While recent federal and state efforts to reduce wetland habitat loss have been relatively successful, this study implies a need for more aggressive action in the Gulf coast area, as the effects of wetland loss reach far beyond individual wetland systems themselves to the Gulf of Mexico as a whole.
Genome Rearrangements Induced by Transposable Elements in Maize  
Dilshan Harischandra (Session I.E.1)

As the world population increases yearly, so does the need for food. Therefore, methods to increase crop yield are vital. Efficient crop improvement will require efficient methods for modifying chromosome structure in order to optimize expression of genes that control important agronomic traits. Transposable elements are sequences of DNA that can move around to different positions within the genome which can generate various genomic rearrangements, including insertions, deletions and translocations. The aim of this research is to investigate the types of genomic rearrangements generated by transposable elements, and to determine how these rearrangements affect gene expression. We used a transgene construct that contains markers (maize c1 and p1 genes) for detection of both l/dSpm transposition and Ac-induced deletions. Transposition of the l/dSpm element can be detected by kernels with red pericarp. Therefore, we used kernels with red embryos to identify excision and reinsertion of the construct. Selected kernels were germinated, DNA was prepared from these seedlings, and plants containing transposed l/dspm elements were detected by PCR techniques. Regions flanking the transposable element insert were isolated using Inverse-PCR and were sequenced. By matching these sequences with those of the maize genome database, we were able to map the sites of insertion within the maize genome. The transposed l/dSpm elements will be used to induce new chromosome rearrangements. The results of this project should lead to new approaches for using transposable elements as tools to enhance crop productivity.

Continuous Productive Urban Landscapes: A Sustainable Design Option to Growing Urban Communities in Iowa  
Jason Grimm (Session I.E.2)

As designers and planners of urban landscapes, landscape architects hold a vital tool in the growth of any Iowa community. Both locally and globally, food has become a common theme in many discussions. Motivations include the lack of productive urban land, lack of societal knowledge of food growing and preparation, urban/rural conflict at the urban fringe, lack of stable urban markets and food insecurity in urban and rural areas in Iowa.

As a senior thesis and honors project in landscape architecture, my goal was to research and design continuous productive landscapes as a tool and or mechanism to sustainable growth in Ames, IA. As infrastructure in a city or town, continuous urban agriculture (UA) has the potential of being a thread that is sewn through a community creating a rigid and ecological backbone to growth that connects neighborhoods, open spaces, and urban markets. Research is based on case studies, interviews of producers and city officials, and observations of UA in London. Productive landscapes as tools to sustainable growth have only recently been written about in the U.S. and Canada. This research demonstrates that urban food systems have a potential of creating environmentally, socially and economically productive communities in Iowa.

A Failure of U.S. Intervention: Environmental and Social Effects of Crop Fumigation in Colombia  
Monica Peterson (Session I.E.3)

Globally, Colombia is the largest supplier of the illicit drug cocaine. A “War on Drugs” campaign in the United States has resulted in an increased focus on eliminating drugs starting at the supply; in many cases, this leads to Colombia. Since the year 2000 the United States has been funding programs in Colombia for the eradication of coca plants with the aerial fumigation of pesticides. These pesticides have recently come under scrutiny because of possible adverse environmental and health effects on the land it is used on. The direct effects of pesticide runoff and other environmental reactions subsequently affect the lives of farmers in Colombia and causes tensions with bordering countries.

In my research I have broken down the chemical used in the eradication program (a mixture of glyphosate,
also known in commercial formulas as Roundup, and a surfactant made in Colombia known as CosmoFlux-411F) and have evaluated it from different perspectives including toxicology, agronomy, and medically. Through discussions with numerous professionals and in my own research, analyses and discussions on the fumigation program focus on the direct and indirect effects of the aerial spraying of chemicals in the environment and the Colombian society.

**Soil Temperature and Moisture Effect on M. x giganteus’ meristem Growth**  
Brian Pfeiffer (Session I.E.4)

This project determines what the ideal soil temperature and moisture is for stem propagated Miscanthus x giganteus. Miscanthus is a promising dedicated energy crop for production of biofuels. The best variety available today, Miscanthus x giganteus, is sterile and must be vegetatively propagated for planting. Currently, the crop is dug up and replanted from rhizome pieces, but this is a costly process. My project will evaluate the environmental conditions needed to propagate M. x giganteus from stem pieces, using controlled environments to investigate the optimum temperature and moisture needed for plant growth. Data that will be collected in the project include LAI (leaf area index), plant height, and

**Exploration of Superparamagnetic Iron Oxides for Wide Frequency, High Temperature Applications**  
Daniel Stoecklein (Session II.A.1)

We obtain superparamagnetic nanocomposites using powerful ultrasound techniques, and can control magnetic properties of the end product. Nanocomposites have many applications in modern technologies. Examples include power generation, engines, radar and microwave applications, military and space technologies, and a plethora of communication devices. Nanocomposites have many advantages over most bulk materials currently in use, such as the absence of electromagnetic losses due to domain wall motion, eddy currents, and negligible coercivity. Our synthesis techniques replace complicated multistage processes typically seen with nanocomposites by utilizing heterogeneous sonochemistry. The process is scalable, and can be implemented in industrial production. Magnetic moment measurements via a SQUID magnetometer provide the first indication of sample quality, while radio-frequency susceptibility measurements test the samples under conditions similar to those found in potential applications. Continued research with these materials will greatly extend their suitability for applications, and possibly lead to new fast and efficient technologies.

**High Speed Electronics Testing for PHENIX Muon Detector Forward Trigger Upgrade**  
Andy Goers (Session II.A.2)

The Pioneering High Energy Nuclear Interactions Experiment (PHENIX) at the Relativistic Heavy Ion Collider (RHIC) at Brookhaven National Laboratories in New York studies matter as it was moments after the big bang. The PHENIX muon detectors see a massive influx of data with collision rates reaching orders of a MHz, so we must be able to determine which events are the most useful and should be saved for analysis. Iowa State physicists have been developing upgrades to the first level trigger hardware for the muon detectors using high speed field programmable gate arrays (FPGAs). High speed electronics often see bit errors due to attenuation or simply from hardware failures. Bit errors in detector electronics can show up as bad data and even “fake” particles, so it is important to know how often these bit errors occur. Pseudo-random binary sequences (PRBS) are often used to test high speed electronics’ bit-error ratios (BER), or error bits per bits received. A BER can be measured by sending out and receiving a known PRBS and checking for errors in the received sequence. I will present results of BER testing of gigabit transceiver protocols on Xilinx Virtex 5 LXT50T and LXT110T FPGAs for PHENIX detector electronics upgrade.
Convective Heat Transfer and Instability in a Wind Tunnel
Michael Peterson (Session II.A.3)

Wind tunnel modeling is an efficient way to determine flow patterns around an obstruction to the general flow. Whether the obstruction is an airplane wing or a building in the boundary layer, wind tunnels allow us to study what is happening in the large scale in a small space and under ideal conditions. Boundary layer studies are especially useful for modeling the forces acting on structures and pollutant dispersion among other things. If the terrain around the test site is flat enough, tests in a wind tunnel can be enlightening. However, these tests fail to take into account an important aspect of the planetary boundary layer: convective instability brought on by a vertical temperature gradient. This can be overcome by adding a heated floor to the wind tunnel, emulating the process in nature by which the earth’s surface heats the lower atmosphere. This study compares the flow patterns with this modified setup with previous data and well-established empirical models of momentum and temperature gradients in the planetary boundary layer.

The Effect of Strengtheners of Polymer Composites
Brian Richard; Joshua Leonard (Session II.B.1)

This research is being used to develop an environmentally friendly substitute for the current composite repair resins. However, while switching to a new resin, the strength of the resin must remain the same. In order to meet this standard, functionalized carbon nanotubes are being added to becy, and the effects on its strength and thermal expansion are being tested. Many military and commercial applications are available for this resin, especially when keeping with a "Green" mentality. The major group interested in this research is the aerospace industry since many modern aircraft are manufactured using composites. One of the major issues with composites is delamination, where a crack forms between two layers of the composite. Delamination causes a major issue for repair since the crack is on the inside of the composite. This resin will provide the aerospace industry with a reliable, in-situ option for repairing composites.

Corrosive Properties of Titanium and Cobalt Chromium Implant Alloys: Analysis of Native Oxide Layer and Open-Circuit Potential
Jordan Trachtenberg (Session II.B.2)

Due to interactions with the human body’s environment, prosthetic implant alloys can experience surface corrosion and ultimate breakdown over time. The human body’s environment can be simulated by solutions of various pH (or level of acidity); for the purpose of the experiment, the range used will be 1.95 – 7.4. The following research includes the study of open-circuit potential and the effects of the solutions on samples of titanium and cobalt chromium alloys. Samples are placed in solutions of various acidities to determine a voltage measurement; the desired result shows how the pH affects the surface and if it poses a threat of corrosion. In addition to open-circuit potential, a three-electrode cell setup is explored to include the possibility of measuring current flow between a cobalt chromium disk and a reference electrode in an etchant. It is hoped that a relationship between pH of solution and measured voltage will be established to better estimate the alloy’s surface interactions with bodily fluids.

Characterization of Magnesium Glass Electrolytes for Magnesium Batteries
Seth Berbano (Session II.B.3)

In order to meet increasing energy storage demands, next generation batteries need to be produced. An alternative to Lithium-ion batteries is a magnesium battery. Magnesium is more environmentally friendly, cheaper, and has more charge carriers than Lithium. In a previous study of Magnesium in non-oxide glasses, Kushwaha and Mishra reported room temperature ionic conductivities as high as 10-3 S/cm in bulk MgS-SiS2 glass-polymer composites. In that publication, no hypothesis for the high ionic
conductivities was presented. In this work, a selenide glass has been prepared as opposed to a sulfide glass. Since selenium is volatile, glasses were prepared in sealed silica tubes as opposed to the mechano-chemical milling technique used by Kushwaha and Mishra. The hypothesis under study is that decreasing the charge density of the glass modifier anion will reduce the binding energy of the glass modifier and produce measurable Mg$^{2+}$ cation conduction. This hypothesis will indicate whether the conduction mechanism is due to decreased binding energy or an open network structure. Data collected using X-ray Diffraction, Differential Scanning Calorimetry, Infrared Spectroscopy, and Raman Spectroscopy will be presented. Future research attempts to measure ionic conductivity with Impedance Spectroscopy and explore different glass modifiers and structures in ternary glass systems.

The Mixed Glass Former Effect in the Na2O+B2O3+P2O5 Glass System

Jennifer Byer (Session II.B.4)

The Na2O+B2O3+P2O5 glass system provides the foundation for an international collaboration between the United States and Europe. This collaboration unites different analytical and hands-on research techniques to investigate the Mixed Glass Former Effect (MGFE). The driving force behind studying the MGFE is its strong effect in the ionic conductivity of these. The industrial application of such glasses are solid glassy electrolytes that would provide more stable, smaller and stronger batteries greatly improving present battery technology. This research project will lay the groundwork to understand the MGFE leading to the investigation of other glass systems that are stronger ionic conductors. Iowa State University's contribution to the project shows that the effect is present in the sodium-borophosphate system even in its most basic mechanical and thermal properties; density and glass transition temperature. These changes in properties are supported by further investigation of the glasses' structures through IR Raman, and XRD Spectroscopies.

American Study Abroad Students: A Correlation Between the Student’s Adjustment and Perception of Social Support

Byron Caesar (Session II.C.1)

The purpose of this study is to see if a correlation exists between adjustment levels of American study abroad students and their perceived social support. In order to find this out, a survey will be given to American study abroad students using the longitudinal design. The surveys will be given to the students two weeks after they arrive at their host country and one month after the first survey was taken. I hypothesize that adjustment and perceived social support will have a positive correlation. The reason this study is being conducted is to find a way to reduce the level of culture shock that is felt by American study abroad students.

Analysis of Terrorism in Ireland and the United Kingdom during the 20th Century

Sean Lynch (Session II.C.2)

My motivation for this project is to fill the void in current research regarding "The Troubles", focusing on what has happened to these groups since peace was reached. While it is often thought of as something that the public wants only to put behind them, a lot can still be gathered from this conflict and applied to current conflicts. This research plays a significant role in current foreign policy bringing peace to war torn areas. This is relevant to previous research in that it is a form of after action review, which one can use to better analyze a situation and the performance of all parties involved. I believe that by researching four terrorist groups that were greatly active during this time period, one can prove that the generally accepted belief is indeed correct that the vast majority of these groups faded away and entirely disbanded, with a few exceptions choosing to resort to criminal enterprises or continuing to commit or plan more acts of terrorism. Using print and internet sources, I will cover group history, ideology, timeline, and actions they took and compare and contrast them. By doing this, we will be able to help resolve volatile conflicts abroad.
Rhetorical Use of Hannibal Barca in Ancient Rome  
Nicholas Dial (Session II.C.3)

This project is a historical research essay centered on the Carthaginian general Hannibal Barca. Hannibal was inarguably one of the most successful field generals of ancient times. In three years he destroyed three Roman consular armies; a feat that allowed him to rampage up and down the Italian peninsula with relative impunity. His masterpiece at Cannae remains one of the bloodiest battles ever fought on European soil. His depredations made him one of the most feared and hated enemies of Rome. One interesting aspect of Hannibal is that our image of him stems almost entirely from ancient Roman sources. Carthage and its culture were eventually wiped from the map. The exact reason behind the Roman record of Hannibal's achievements remains open to interpretation. This research essay analyzes what rhetorical tools were at play in Roman portrayals of the archenemy. Every document has a message behind it. By evaluating how the Romans treated their rival in literature we may be able to obtain greater understanding of what elements are at play when we portray our own adversaries.

Divided Minorities Struggling for Autonomy  
Michael Kostboth (Session II.C.4)

This research focuses on minority groups attempting to attain some degree of autonomy. Specifically, the research addresses the affect that multiple factions within the same movement have upon the movement’s success. Insurgencies and terrorism are key issues for security in the international system. This study seeks to better explain and predict why some groups obtain autonomy and some do not. The main hypothesis is that movements with more groups provide the state with a wider number array of choices in negotiations. Previous research has been unable to effectively count the number of groups active within a given movement over the last forty years. By using the Minorities at Risk and Uppsala conflict database, and the Keesings and Lexis Nexis search engines I am able to compile a comprehensive list of groups active in a given year in a way that was impossible before the advent of the internet and search engines. This research can serve as the basis for deeper analysis into the different natures of autonomy movements to explain why some fail while others succeed, and why some are solved quickly and others last for decades.

Structure-Function Relations of the Nucleotide-Binding Proteins of Osmoregulatory ABC Transporters  
Teppei Shirakura (Session II.D.1)

My research is to identify the structure-function relationship of the Pseudomonas syringae protein OpuCA, which functions as the nucleotide binding domain of the ATP-binding cassette transporter, OpuC. OpuC is an osmoregulatory protein in the high salt environment. Understanding of OpuC can explain diseases such as adrenoleukodystrophy and lymphocytocyte syndrome. OpuCA has a C-terminal cystathionine β-lyase domain (CBS domain). We hypothesize that the CBS domain activates OpuC by binding Adenosine Triphosphate (ATP). However, how the CBS domain is used to activate the protein is remains unknown. Thus, I am focusing on identifying the crystal structure of OpuCA in order to gain fundamental insights into the activation of OpuC. OpuCA was overexpressed by Escherichia coli in our lab. We are now crystallizing OpuCA using hanging-drop vapor diffusion method. Following crystallization, we will determine the crystal structure of OpuCA at the atomic resolution. The structure is expected to provide us direction information about the mechanism of action of this protein. In order to analyze whether the protein is functional, TNP-ATP, ATP analog, binding assay was performed. The dissociation constant of ATP for OpuCA is 1.78 µM, which is similar to other nucleotide-binding proteins. For future work, I am going to improve crystals quality and determine the structure of OpuCA.
Spontaneous calcium activity in differentiating Adult Rat Hippocampal Progenitor Cells
William Law; John Callahan (Session II.D.2)

The use of neural stem cells is an exciting therapeutic strategy for treating neurodegenerative diseases and injuries to the nervous system. A fundamental issue is to understand the biology of these cells in an effort to direct their differentiation, behavior, and activity. Our studies focus on multipotent neural stem cells isolated from the adult rat hippocampus. These neural stem cells have the ability to differentiate into neurons and glial cells. Recently we have identified spontaneous calcium activity, an increase in basal calcium by over 50%, in these cells that correlates with their differentiation into neurons and glia. We see dramatic changes in the waveform of this activity as the neural stem cells differentiate. This activity may play a critical role in the differentiation of these adult neural stem cells, and may provide a means in which to control their differentiation into specific cell types.

Crystal Structure and Role of Transcriptional Repressor AcrR from Escherichia Coli
Kaelynn Koch (Session II.D.3)

The heavy usage of antibiotics to treat bacterial infections has lead to increased levels of drug resistance in bacteria. Bacteria can combat antibiotics by utilizing multidrug resistance pumps to actively extrude compounds entering the cell. Understanding the multi drug resistant protein pump in Escherichia coli, AcrAB, and the protein that controls its expression, transcriptional regulator AcrR, is key to determining how multidrug resistance is propagated in bacteria. AcrR regulates the production of AcrB by sensing the chemical environment of the cell. AcrR, like other TetR transcriptional repressors, binds DNA to repress transcription. Upon ligand binding, it is hypothesized a conformational change is transmitted to the DNA binding region of AcrR, rendering the protein unable to bind DNA. Using x ray crystallography, our lab has determined the crystal structure of two distinct conformations of AcrR. These structures are believed to be related to the ligand bound form and the DNA bound form of AcrR. Models predicting the structure of AcrR-DNA complex have been constructed using the data from the structure of apo-AcrR and members of the TetR family. Currently, crystals of the AcrR-DNA complex have been obtained and diffracted to 3.2 Å. Future work is focused on solving the structure of the ligand bound and DNA bound form of AcrR in hope that this information can be used to engineer novel antibiotics.

Characterization of Multipotent Adult Rat Hippocampal Progenitor Cells Maintained as Neurospheres
Gabrielle Daniels (Session II.D.4)

Multipotent neural progenitor cells isolated from the adult rat hippocampus (adult hippocampal progenitor cells, AHPCs) are capable of self-renewal and can differentiate into neurons and glial cells. The use of neural progenitor cells is an important strategy for possible treatment of neurodegenerative disorders. To study AHPC differentiation in a three-dimensional (3-D) microenvironment, we generated neurospheres from adherent AHPCs. The differentiation potential of AHPCs under three different culture situations was compared - adherent AHPCs, AHPC neurospheres, and AHPCs dissociated from spheres. Using immunocytochemical analysis, AHPC differentiation was assessed using neuronal and glial cell specific-markers. Proliferation was examined by 5-bromo-2-deoxyuridine (BrdU) incorporation. We found that AHPCs in-sphere and dissociated cells appeared to differentiate more toward glial cells than neuronal cells when compared to the adherent population. Furthermore, we observed no clear differences in proliferation or in neuronal or glial differentiation of AHPCs in-sphere or dissociated cells. Overall, these results demonstrate that AHPCs maintained in neurospheres are destined toward glial lineages rather than the adherent AHPCs. These results suggest that a 3-D cellular microenvironment can influence the differentiation of neural progenitor cells.
Changing Binge-drinking Cognitions: The Impact of Mode of Processing, Comparison Targets and Past Behavior

Miko Wilford (Session II.E.1)

Absent-exempt (AE) is the belief that if one has not experienced negative consequences, despite engaging in risk behavior, then one is unlikely to in the future. This study examined how mode of processing and social comparison manipulations affect AE thinking with students’ own alcohol risk behavior as a moderator. All 122 participants reported past binge drinking without alcohol poisoning (T1). At T2, participants were instructed to think rationally or heuristically and heard a comparison target who engaged in binge drinking and did or did not suffer alcohol poisoning (victim vs. nonvictim). Participants’ drinking behaviors were assessed one month later (T3).

Multiple regression analyses showed significant participant risk-level by processing manipulation by comparison target interactions on AE. High-risk participants in rational-victim condition reported lowest levels of AE (Beta = -.09, p < .03). Higher levels of AE endorsement (Beta = .935, p < .04) at T2 predicted binge drinking at T3.

The Effects of Religiosity on Student Well-Being and Academic Performance

Dionne Trumbo (Session II.E.2)

Religiosity/spirituality may be a significant factor in predicting whether a college student will be able to cope with the many stresses brought on by college. College students experience many life-changing events that create stress and other negative psychological effects, and in order to excel in their academics, students must know how to deal effectively with the stress. To explore the role of religion/spirituality in giving meaning to life and helping with stress and academic performance among college students, 200 participants will fill out a questionnaire that assesses level of religiosity, stress, and academic performance. The hypotheses were that students low in religiosity will have more stress than those high in religiosity, that there will be differences between men and women’s religiosity and its effect on well-being, such that women are more religious and benefit more from high religiosity, and that a relationship exists between religiosity and academic performance measured by grade point average. The predicted results have implications for the importance of religiosity and future research.

Cognitive Strategies Used by Triathletes to Get Through the Pain

Thomas Mazula (Session II.E.3)

Triathlons are exhausting events, both physically and mentally. Previous research has examined various cognitive coping strategies revolving around association (internal focus) and dissociation (external focus), primarily for distance runners. However, no studies have so far examined how consistently athletes use these strategies across different events, each posing its own unique challenges. This project will examine this question by having triathletes who have participated in a triathlon within the last two weeks fill out an online version of the Attentional Focus Questionnaire (Brewer, Van Raalte, & Linder, 1996) and the Four Types of Coping Strategies Questionnaire (Stevinson and Biddle, 1998). I hypothesized that the cognitive strategies will be consistent for experienced triathletes while inexperienced triathletes will dissociate in the portion of the race they feel the least prepared for. These results will shed light on the consistency of cognitive strategies used by triathletes throughout the entire triathlon, as well as possible similarities and differences between genders and different levels of competition. This study will further the understanding of the psychology of distance athletes and provide new avenues for future research on the psychology of triathletes.
The Accumulation of Self-Fulfilling Effects as Demonstrated through Social Stereotypes
Ozioma Oji (Session II.E.4)

The objective of this study was to test the hypothesis that the self-fulfilling effects of a social stereotype can accumulate across multiple perceivers. The study included two phases. In Phase 1, participants were shown a photo of an obese or thin woman whom they believed was another participant and asked to select an amount of candy for her to eat in the subsequent phase of the study. In Phase II, one third of participants received the combined amount of candy selected by two Phase 1 participants who believed the participant was obese. Another third will receive the combined amount of candy selected by two Phase 1 participants who believed that the participant was not obese. The final third received the combined amount of candy selected by two Phase 1 participants, one who believed the participant was obese and another who did not.

Structural Characterizations of the Ebola VP35 Proteins
Mina Farahbakhsh; Luke Helgeson (Session III.A.1)

Ebola Virus (EBOV) infection is often characterized by severe hemorrhagic fever and is highly fatal; however, there are no approved treatments. Multifunctional Ebola viral protein 35 (VP35) is involved in host immune suppression and viral replication. Recent studies show a correlation between dsRNA binding to the VP35 C-terminal interferon inhibitory domain (IID) in vitro, and interferon inhibition in vivo. Our lab recently solved the crystal structure of the VP35 IID and identified a critical basic patch. The mutation of basic residues in this patch leads to decreased RNA binding, which also corresponds to diminished interferon inhibition in vivo. The mechanism by which these mutations affect RNA binding is unknown. The focus of our research is to understand, through structural analyses, the role of these identified basic patch residues on RNA binding. We expect that these findings will help to better understand the function and features of VP35 and to open the possibility of designing antiviral drugs against EBOV.

Examining Different Forces in the Hamstrings and How They Compare During Walking, Sprinting, and Hurdling
Isaac Hinton (Session III.A.2)

The purpose of this study is to observe the change in forces experienced on the hamstrings during walking, running, and hurdling. With this information, a comparison relating the change in forces experienced to the frequency of injuries in the three muscles (bicep femoris, semimembranosus, semitendinosus) will be made to see if a greater change in forces positively correlates to the number of reports injuries. It was hypothesized that the bicep femoris is injured more often due to the fact it experiences the greatest change in forces. This study will involve three track and field athletes from a public, D-I A Midwestern university. Each subject will perform five trials for each event (walking, running, and hurdling). The data will be collected using a force platform, eight Vicon cameras, and Nexus software. Subject specific anthropometric model will be created to simulate each trial and give the calculated hamstring forces at any point. The results of the study show that the forces experienced on the hamstrings have no significant effect on a higher frequency of bicep femoris injuries reported.
The Role of Mammalian Orthoreovirus in Stress Granule Formation
Kate Kreger (Session III.A.3)

In a normal cell a response mechanism to viral infection is the formation of stress granules which can function in preventing viral replication. With Mammalian Orthoreovirus (MRV) however, stress granule formation is interrupted and viral replication proceeds. The focus of this project is to identify which one(s) of the ten genes found in MRV is responsible for disrupting the stress granule formation. This is accomplished by creating cell lines that constitutively express each of the ten genes found in the MRV. These cell lines are tested and the results visualized with fluorescence microscopy in order to determine which one(s) play a role in “blocking” successful stress granule formation. It is hoped that through finding the method for viral replication in MRV we will gain an understanding of how the cell reacts to this type of infection and possibly use this knowledge to create a regulatory method for controlling MRV infection.

Cytotoxicity with Ethanol of Various Species and Accession of Hypericum
Angela Nguyen (Session III.A.4)

Hypericum, usually called St. John's Wort, is a member of the family Clusiaceae widely used as a supplement for mild depression and inflammatory conditions. Previous research has shown that certain organic extracts from Hypericum had anti-inflammatory activity in mouse macrophage model. Due to the fact that some known-components affect cell viability, establishing the cytotoxicity profile is important to validate biological activities of new species in the accessions.

Methods: Ethanol extracts/fractions of Hypericum are applied to well established RAW 264.7 mice macrophage cell culture at the highest dose used in for bioactivity screening. After 24 hours incubation with the treatment, MTS reagent is applied to cell culture. Optical absorbance is measured at 562 nm. Cell viability of each treatment was compared to DMSO vehicle control for cytotoxicity assessment.

Results: The expected result will be no reduced cell viability for media, vehicle controls, as well as hypericum extract/fractions at their highest concentration used for bio-activity assay. On the other hand, positive controls successfully induce cytotoxicity and thus validates the whole assay.

Implications: The absence of cytotoxic effect shown by this study rules out the possibility of reduced inflammation resulting from decrease in viable cell counts, and in turn validates the anti-inflammatory activity.

In Focus: The Beauty of ISU Architecture
Shannon Schaefer (Session III.B.1)

A student of photography, I relied on this medium to increase appreciation for the architecture of Iowa State University campus buildings. Students and faculty walk by or through campus structures daily, often without noticing. My focus is to draw attention to a selection of early buildings constructed at Iowa State, because these are the campus foundations. I will present 16 photographs of the following buildings: Farm House, Sloss House, Campanile, Marston Hall, Beardshear Hall, Curtiss Hall, MacKay Hall, and Memorial Union. Though I used a digital camera, my work maintains a traditional quality, with images in rich black and white tones with minimal to no manipulation. Historical knowledge of each structure conveys the legacy of these buildings of Iowa State. Photographing specific details and unique angles, which few notice, will invite the viewer to take a second look and increase their awareness of the structure. Iowa State University architecture has beauty, character, and a significant role in the education process frequently overlooked by many. “Housing” students and faculty, Iowa State architecture, establishes foundations for a learning environment. Combining historical research and artistic discoveries my goal is to expand appreciation of Iowa State architecture for a broad audience.
Studying Medical Decision Aids
Becky Murphy; Gina Assmann; Melissa Dilling (Session III.B.2)

The Design Information Research Group’s (DIRG) objective is to learn about the opinions and perceptions of medical decision aids. We plan to use this information to design a better experience for patients making decisions about their health care. DIRG is working with the Mayo Clinic to design an evaluation tool for their diabetes decision aids. We are exploring design variables such as: texture, color, typeface, size, and iconography. DIRG has been meeting with focus groups and is currently surveying individual participants. Our questions are based on the Kansei Methodology, a technique that measures social and emotional responses. Participants respond to comparative adjectives and open-ended questions. From these responses, we expect to discover the most effective and trustworthy methods of designing this medical information. In the long run, the goal of this study is to facilitate better patient-doctor experiences, and empower patients to make improved health care decisions.

Furniture Art
Andrew Kopp (Session III.B.3)

Furniture is a part of most people’s daily life, but is generally taken for granted. Few give much thought to the process underlying its conception or understand that for some makers, furniture is a form of artistic expression. This presentation will cover the process involved in conceiving and making furniture from the research and work that precedes a formative idea, to the steps involved in making furniture one piece at a time. The presentation will focus on two pieces that were made in advanced furniture studio courses here at Iowa State University and subsequently accepted into nationally juried shows.

Sustainability and Packaging
Melissa Gasway (Session III.B.4)

Graphic design has traditionally been a studio-based creative profession. It focused on communication and marketing as they apply to the design of products and information. However, because graphic design grew out of a fine arts tradition, little or no attention was given to the research and investigation of critical issues in graphic design.. Today, issues such as sustainability, recyclability, carbon footprint, the effect packaging and packaging waste have on global and local economies are critical to our society. This research will examine these issues with regard to how they impact design considerations. I will be developing a design and sustainability rubric that can be used as a guide for both the design of new packaging and in evaluation the impact of existing package designs. This rubric can be used both as an educational tool for graphic design students to learn about the environmental impact of their designs and by professionals in the field. A design component for this project will consist of one redesign of an existing package design and the design of a new package based on the rubric.

Evaluation of Mycoplasma Hyopneumoniae Recombinant Proteins by Western Blot
Leanne Schulz (Session III.C.1)

Mycoplasma hyopneumoniae (Mhyo), the causative agent of enzootic pneumonia, is a significant source of economic loss in the swine industry today. While Mhyo is generally ubiquitous, many producers are working to eradicate the disease from their herds. This requires more accurate diagnostic assays that detect the presence of Mhyo in pigs and to screen replacement animals. Serology, utilizing commercial ELISA tests, is routinely used to monitor exposure to Mhyo because of its low cost and ease of sample collection. However, existing tests are not sensitive and specific for all Myho strains; thus the need to identify new Myho antigens for use in an ELISA. In preparation for evaluation by ELISA, Mhyo genes
have been transformed into a protein expression vector. This project will involve optimization of expression and purification of the recombinant proteins. The proteins will be run on Western blots and evaluated for correct product size and purity against hyperimmune rabbit serum and swine sera from infected animals. These proteins will be tested using an ELISA with swine serum samples collected in the ISU Diagnostic Laboratory.

**Evolutionary Similarities between Avian and Human Extraintestinal Pathogenic *Escherichia coli* Using MLST**

Kathy Mou (Session III.C.2)

Previous studies suggested *Escherichia coli* causing infections outside the intestine (Extraintestinal pathogenic *E. coli* or ExPEC) in poultry are similar to ExPEC causing infections in humans. We hypothesize that human ExPEC are related to avian ExPEC, even though these pathogens originate from different hosts. This study will determine if there are evolutionary similarities between the human and avian ExPEC. One way of determining their relatedness was by employing the method Multi Locus Sequence Typing (MLST). MLST compares seven genes necessary for normal cellular functioning in all *E. coli* strains. This method assigns a unique sequence type number to strains with identical DNA sequences over the seven genes. Analysis of 112 ExPEC strains indicated roughly 43% had the same sequence type (ST95) regardless of what host the strain came from. In addition, almost 55% of the strains (including both avian and human ExPEC) belonged to a larger group complex of strains with similar sequence types (ST95 complex). With so many ExPEC strains sharing the same allelic profile, it can be inferred that there is possibility for these ExPEC strains to infect other host species outside its native host.

**Transcriptome Analysis of Altered Satellite Growth Phenotypes of *Mycoplasma Pneumoniae***

Andrew Petersen (Session III.C.3)

*Mycoplasma pneumoniae* is the leading cause of pneumonia in school-age children and young adults with an estimated 2 million cases a year. A general requirement of successful infection is attachment to trachea epithelial cells utilizing a gliding motility that is poorly understood. To study this system, four mutants (transposon inserts in MPN107, MPN110, MPN342, and an intergenic region) were identified as having an altered satellite growth phenotype indicative of problems with gliding motility. Each of the four mutants was compared to wild type by transcriptional profiling using a two-color oligonucleotide microarray representing all gene-specific sequences. Total RNA was isolated from mycoplasma cell pellets (wild type and mutant, eight of each), converted to cDNA, fluorescently labeled with Cy3 and Cy5, and hybridized to microarrays. Each mutant was compared to wild type using a dye swap design. Each array was scanned in two colors, and statistical analysis was performed using R and SAS programs to identify significant differentially expressed genes. The analysis has been completed with two of the mutants, MPN107 and MPN110. This study of gliding motility may give insight into the interconnected nature of cytadherence, gliding motility, and the function of the terminal organelle.

**Evaluation of the Effect of Airway Hypersensitization on the Immune Response to *Mycoplasma Hyopneumoniae***

Elizabeth Rash (Session III.C.4)

*Mycoplasma hyopneumoniae* (MHYO), the causative agent of enzootic pneumonia and a major component of the porcine respiratory disease complex, is a significant source of economic loss to swine producers worldwide. The specific mechanism(s) by which MHYO induces lung lesions remains unidentified. However, immune modulation resulting in an ineffective and pathologic immune response in the respiratory tract is thought to be an important contributor. In addition, a correlation has been made
between decreased air quality and increased MHYO pneumonia severity. Our hypothesis is that airway hypersensitization from environmental factors contributes to the increased respiratory disease observed in the field. Four groups with five pigs per group were compared in this study, control vs MHYO-infected (normal disease pathogenesis) and ovalbumin only vs ovalbumin/MHYO infected (hypersensitized airways). To identify important immune-response genes, swine microarrays were used to study transcriptional changes that occur during disease progression. Pigs were necropsied 28 days post infection and lung tissue was collected. RNA was isolated from each lung tissue sample, fluorescent dye-labeled cDNAs were generated and hybridized using a dye-swap design. The microarrays were scanned and analyzed for statistically significant immune responses in genes.

**A Man's Survival Guide to Getting Married**
Cliff Dolbeare (Session III.D.1)

Well over two million couples wed each year in the United States. While their weddings can range from quite simple to excessively extravagant they all tend to have one common aspect. That is that most of the individuals involved in the nuptial process seek out some sort of assistance. This assistance is often in the form of advice on planning and carrying out the actual wedding ceremony. Sometimes the help individuals look for is a better understanding of marriage, their future spouse, and just getting through the wedding process. The aim of this research was to determine the quantity, but more importantly the quality, of self-help books on weddings that are specifically written for men. This research was completed to establish the foundation of a larger project. The findings of this investigation will be used in planning, justifying, and writing a book for men about surviving their wedding.

**Exploring the Portrayal of Black Women and their Sexuality in Romance Novels**
Brionni McGriff (Session III.D.2)

This project explores the portrayal of African-American women in modern literature, specifically in romance literature. This research examines the portrayals of African-American women both in mainstream romance literature and in romance literature marketed towards African-American readers. This research is based on Black Feminist Theory as developed by Patricia Hill Collins, which provides information on the basic foundations of the roles of black women and their role in society. This research also examines the work of Janice Radaway and Pamela Regis to gain foundational understanding on the genre of romance novels as a whole, such as its beginnings and major developments within the genre. The data for this study is based on content analysis of the three top-selling romance novels, marketed towards African-American women readers. The theories of Patricia Hills Collins and other literary critics will be used to examine the roles the women play and their portrayals with these novels. This will be done by examining the tone, language and images used in the novels. By doing this, this project seeks to explain and understand the major themes and trends with in romance novels and how these novels are reflective of the ideas of society as a whole.

**The College Girl: A Content Analysis of the Ideal as Portrayed in Mademoiselle, 1950-1959**
Emily Bishop (Session III.D.3)

Mademoiselle magazine dedicated each August issue in the 1950s to college women, calling it “The College Issue.” This study’s purpose is to give greater understanding to the ideal college girl. Mademoiselle portrayed and if this is a realistic representation of college women in the 1950s. Mademoiselle’s editorial and advertising content were primary points of study. The unit of analysis examined included verbal content analysis such as editorials and articles and non-verbal content analysis, such as advertisements. Secondary sources contributing to the study include the journal, Dress published by the Costume Society of America, as well as historian’s research about women and college to provide a background to the time period. The editorial pages included fashion, beauty, and hygiene advice and
recommendations. Advertisements in the 1950s Mademoiselle often targeted the ideal white, slim, and conservatively-dressed college girl, whether through advertisements for beauty or fashion products. Preliminary results suggest Mademoiselle’s editorial and advertising content portrayed an ideal college girl, although not entirely reflective of all college women in the 1950s. This study is important because it explores the ideals of beauty and body image for college women as portrayed in the popular media of the 1950s.

Does Feeling Happy or Sad Influence Brand Judgments?
Paige McQueeney (Session III.D.4)
Does Feeling Happy or Sad Influence Brand Judgments? Previous research has been done on comparative judgment and on the affect of mood on judgment, but few studies have delved into mood affect on comparison judgment. This research provides insight into the effect of mood on comparative advertising and investigates the role of comparative frame and attribute type in judgments of brand attributes. Feeling happy or sad is known to affect consumers’ attitudes toward an object or brand. On a cognitive level, individual brand judgments are influenced by the simultaneous presentation or background context. Individuals may perceive a brand differently when it is explicitly compared to another brand than when the brand is presented by itself in a non-comparative context. Another variable that will be examined is the type of attribute that is being primed in an ad. Previous studies in comparative advertising show that the comparison process affects differently factual and evaluative attributes. We are using an experimental approach to better understand how affect will interact with these cognitive variables to affect judgments of brands.

Comparative Sequence Analysis of the Bovine Prion and Doppel Genes
Allison Hannen (Session III.E.1)
The prion protein gene, PRNP, is present in all vertebrates, and the normal protein product of the gene, PrPC, is highly expressed in the central nervous system. Efforts have been made to determine the role that PrPC plays in the brain, but the function of the protein is still not clear. Comparing PrPC to doppel, a homolog of PrPC, may lead to a better understanding of the function of PrPC and even how the conversion of PrPC into an abnormal and infectious form, PrPSc, causes disease. The goal of this project was to perform sequence analysis and comparisons of the bovine PRNP and PRND genes in order to gain insight into any evolutionary pressures acting upon the encoded proteins of the genes. Also, comparing these evolutionary pressures gives a better idea of how many binding partners PrPC is likely to have. Investigating the sequence conservation of PRND in Bos indicus, Bos taurus, and composite cattle and comparing the sequence conservation of PRNP to that of PRND in the same group of animals revealed that there is substantial evolutionary pressure acting upon PRNP that deters amino acid sequence change in PrPC. This finding indicates that PrPC may have many binding partners.

Optimum Checkerboard Selection for Structured Light System Calibration
William Lohry (Session III.E.2)
For any three-dimensional shape measurement system, the calibration accuracy is one of the key determinant factors for the measurement accuracy. For the structured light system calibration method using flat checkerboards, the checker square size plays a vital role on the accuracy of the calibration, because of the digital effect of the camera and the projector, and because of the accuracy of the checker corner detections. In this research, we will systematically study how the checker size affects the calibration accuracy, and provide a general guideline to select the optimum checker size for high accuracy system calibration.
Alkaloid Extraction and Purification from Catharanthus Roseus Hairy Root Tissue  
Diane Brown (Session III.E.3)

Plant metabolic engineering of Catharanthus roseus may provide improved ways of producing vincristine (Oncovin®) and vinblastine (Velbe®) which are used in the treatment of cancer. The tabersonine branch point is very important for the synthesis of vindoline which is a key precursor to vincristine and vinblastine. Researchers use genetically modified C. roseus hairy root lines to analyze the flux of metabolites at the tabersonine branch point. Genes inserted by recombinant DNA techniques can amplify or suppress flux through existing metabolic pathways and can create new metabolic pathways for desired products that are not expressed in the wild-type line. By suppressing flux to undesired products like hörhammericrine, tabersonine flux can be diverted to the vindoline-vinblastine-vincristine pathway. One of the current research challenges is the lack of commercially available standards to quantify low-level metabolites at the tabersonine branch point. A biomass extraction and analytical HPLC protocol was adapted for semi-preparative scale in order to obtain tabersonine, lochnericine, and hörhammericrine standards from C. roseus hairy root tissue. Standards will enable improved study of the metabolic pathways originating at the tabersonine branch point and will allow for the determination of previously unidentified co-eluting tabersonine-like compounds.

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

Currently in the United States there are twenty-five states with official English-only Laws. The first emergence of English-only laws was seen in April 27th, 1981 as a constitutional amendment, known as the English Language Amendment, which is designed to ban the use of non-English language, at all levels of the government. This potentially controversial amendment has yet to come to a Congressional vote. The purpose of this research is to examine the attitudes of non Hispanic college aged women in regards to English being declared the official language of the US. Data will be collected by means of a website based survey. Expected results are that a generally low understanding of the issues related to English-only laws exists, which in turn would affect the attitudes the participants felt in regards to English being declared the official language used within the United States.
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