

# Spring Undergraduate Research Festival

This event is hosted by the  
Iowa Center for Research by Undergraduates.  
ICRU promotes undergraduate involvement in  
research and creative projects at the University of  
Iowa, serving students, staff, and faculty.

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Celebrating  
five years of  
interdisciplinary undergraduate  
research presentations  
at The University of Iowa



April 25, 2009  
Blank Honors Center Atrium

**93 - Jared James Stewart**  
*Search for Supersymmetry in Proton-Antiproton Collisions*  
Majors: Physics, Astronomy, & Mathematics  
Mentor: Dr. Jane Nachtman, Physics

**94 - Mallory Stroik**  
*The Role of  $\alpha$ PKC in the Early Development of the Superficial Epithelium in Zebrafish*  
Major: Biology  
Mentor: Dr. Robert Cornell, Anatomy and Cell Biology

**95 - Max Holte Turner**  
*The Zebrafish as a Model for Cerebral Ventricle Research*  
Major: Biology  
Mentor: Dr. Alan Kay, Biology

**96 - Annie Elizabeth Tye**  
*Diverse Splicing Patterns of Exonized Alu Elements in Human Tissues*  
Major: Biology  
Mentor: Dr. Yi Xing, Internal Medicine

**97 - Rajiv Kumar Verma**  
*"Are Medical Students Learning What Faculty Members Are Trying To Teach?"*  
Major: Integrative Physiology  
Mentors: Dr. Susan Hagen & Dr. Kim Ephgrave, Surgery

**98 - Annah Jean Vollstedt**  
*U.S.-Funded HIV/AIDS Prevention Programs in Kampala, Uganda: The Gap Between the Theoretical and the Practical*  
Major: Communication Studies  
Mentors: Dr. John Peters & Dr. Tim Havens, Communication Studies

**99 - Suleimaan Waheed**  
*Equestrian Helmet Use in Horse Organization Promotional Materials*  
Major: Biology  
Mentor: Dr. Charles Jennissen, Emergency Medicine

# Spring Undergraduate Research Festival Schedule

Saturday, April 25, 2009

85 - Zachary Lyle Rodenburg  
*Pesticide Chlordane in Cedar Rapids Sediments Following the 2008 Flood*  
Major: Chemical Engineering  
Mentor: Keri Hornbuckle, Civil and Environmental Engineering

86 - Kelly Susan Salm  
Major: Microbiology  
Krista Renee Young  
Major: Pharmacy Interest  
*Low Glucose Concentration in the Airway Surface Liquid is Important to Maintain a Sterile Airway Surface*  
Mentors: Dr. Joseph Zabner & Dr. Alejandro Pezzulo, Internal Medicine

87 - Gregory James Samuels  
*Effect of Solute Additions on Dendritic Growth*  
Major: Mechanical Engineering  
Mentor: Dr. Christoph Beckermann, Mechanical and Industrial Engineering

88 - Christina Marie Schiltz  
*Population Dynamics of Asexually Reproducing Potamopyrgus Antipodarum*  
Major: Biology  
Mentor: Dr. Maurine Neiman, Biology

89 - Michael D. Schulz  
*Synthesis and Fabrication of Novel Soft Materials*  
Major: Chemistry  
Mentor: Ned Bowden, Chemistry

90 - Kyle Joseph Sims  
*Odor Preferences and Learning Capabilities of Drosophila Flies with Specific Olfactory Receptor Neuron Mutations*  
Major: Biology  
Mentor: Chun-Fang Wu, Biology

91 - Zachary John Stecklein  
*A Genome-Wide Forward Genetic Screen has Identified Genomic Regions that Likely Contain Genes Functioning in Concert with Shu*  
Major: Biology  
Mentors: Dr. Toshihiro Kitamoto, Dr. Junko Kasuya & Garrett Kaas, Anesthesia

92 - Brenton John Steinmann  
*Evaluation of a Compliance Chamber Designed to Improve the Performance of an Artificial Lung*  
Major: Biomedical Engineering  
Mentor: Dr. William Lynch, Cardiothoracic Surgery

Posters—Session 1 11:00AM–12:00PM  
ARTS, HUMANITIES, & SOCIAL SCIENCES

Opening Remarks 12:00PM  
ROBERT KIRBY  
Director, Iowa Center for Research by Undergraduates  
BETH INGRAM  
Interim Associate Vice Provost for Undergraduate Education & Dean of the University College

Excellence in Undergraduate Research Awards Presentation 12:15PM  
JORDAN COHEN  
Interim Vice President for Research

Poster Awards for Session 1 12:30PM  
ROBERT KIRBY  
Director, Iowa Center for Research by Undergraduates

Posters—Session 2 1:00 PM–2:00PM  
MATHEMATICS, ENGINEERING, & NATURAL SCIENCES

Poster Awards for Session 2 2:00PM  
ROBERT KIRBY  
Director, Iowa Center for Research by Undergraduates

\* Denotes Excellence in Undergraduate Research Award Recipient  
☞ Denotes Distinguished Mentor Award Recipient

# ARTS, HUMANITIES & SOCIAL SCIENCES

## PRESENTERS

- 1 - David Anderson  
*Dissociation between Figure and Ground During Binocular Rivalry*  
Major: Psychology  
Mentor: Dr. Cathleen Moore, Psychology
- 2 - Jason Wendell Arduser  
*Parent-Teacher Conferences: Multicultural or Monocultural?*  
Major: Elementary Education  
Mentor: Dr. Carolyn Colvin, Teaching and Learning
- 3 - Rachel Mary Bender  
*Researching and Addressing Health Challenges in the Local Latino Community*  
Major: Global Health  
Mentors: Dr. Kristi Ferguson & Dr. David Bedell, Family Medicine
- 4 - Leighton L Christiansen  
*Midlives: Works in Progress*  
Major: English  
Mentor: Dr. Dee Morris, English
- 5 - Eric Craft  
*Predictive Associations Between Bulimic Symptoms and Substance Use*  
Majors: Psychology & Computer Science  
Mentors: Dr. David Watson & Kelsie Forbush, Psychology
- 6 - Kaitlyn Davids  
*Examination of Salt Homeostasis in an Animal Model of Depression*  
Major: Interdepartmental Studies-Health Science: Health Coach  
Mentors: Dr. Ralph Johnson & Dr. Alan K. Johnson, Psychology
- 7 - Ventara Berniece Dillon  
*Racialism in the media*  
Majors: Journalism and Mass Communication & African American Studies  
Mentor: Dr. Venise Berry, African American Studies, Journalism and Mass Communication

- \*77 - Caitlin Scarlett Moore  
*The Relationship Between Neuropsychological Performance and Difficulty in Daily Activities in Individuals with Atherosclerotic Vascular Disease*  
Major: Psychology  
Mentor: Dr. David Moser, Psychiatry
- 78 - Eric Mou  
*Specific Identification of Cyclin G2 Upregulation Implicates Its Role in Cell Cycle Arrest*  
Major: Biomedical Engineering  
Mentor: Dr. Mary Horne, Pharmacology
- 79 - David William Nelms  
*Assessment of Three Dead Detector Correction Methods for Cone Beam Computed Tomography*  
Majors: Applied Physics in Medicine & Biochemistry  
Mentor: Dr. Ryan Flynn, Radiation Oncology
- 80 - Rebecca Paszkiewicz  
*No More Finger Pokes for Diabetics: Impact of Skin Color on Noninvasive Measurements with Near Infrared Spectroscopy*  
Majors: Chemistry & Theatre Arts  
Mentors: Dr. Mark Arnold & Chuannan Bai, Chemistry
- 81 - Austin Peiffer  
*Notes from Numbers: Creating Music Using Mathematics*  
Majors: Mathematics & Music  
Mentor: Dr. Dennis Roseman, Mathematics
- 82 - Peter Ricci Pellegrino  
*Automated Bayesian Classification for the Segmentation of Lesions in Vascular Disease*  
Major: Biomedical Engineering  
Mentor: Dr. Vincent Magnotta, Radiology
- 83 - Michelle Diane Potts  
*High Energy Physics: Analyses of Signals from Exotic Particles*  
Majors: Electrical Engineering & Applied Physics  
Mentors: Dr. Yasar Onel & Dr. Jane Nachtman, Physics and Astronomy
- 84 - Mackie Prescott  
*Optimization of Nanoparticle Rattles for Surface Enhanced Raman Scattering*  
Major: Biomedical Engineering  
Mentor: Dr. Amanda Haes, Chemistry

68 - Myra Frances Laird  
*Morphometric analysis of the Montastraea cavernosa complex in the Miocene to recent in the western Caribbean*  
Majors: Anthropology & Geoscience  
Mentor: Dr. Ann Budd, Geoscience

69 - Rachel Levine  
*Photopolymer Micropatterns to Enhance Nerve Growth in Cochlear Implants*  
Majors: Chemical Engineering & Music Performance  
Mentor: Dr. Allan Guymon, Chemical and Biochemical Engineering

70 - Hoang Mai  
*Synthesis and Characterization of Chitosan-Coated Liposomes*  
Major: Chemical Engineering  
Mentor: Dr. Aliasger Salem, Pharmaceuticals

71 - Tim Mansheim  
*A Robust, Microwave Rain Gauge*  
Major: Electrical Engineering  
Mentor: Dr. Anton Kruger, Electrical and Computer Engineering

72 - Alyssa Diane Marchetti  
*Medical Decision-Making Ability: Examination of Demographic, Cognitive, and Personality Correlates*  
Major: English  
Mentor: Dr. Natalie Denburg, Neurology

73 - Sean Daniel McGivern  
*Novel FRMD7 Mutation in a Pedigree with Congenital X-Linked Nystagmus*  
Major: Biology  
Mentor: Dr. John Fingert, Ophthalmology

74 - Anthony John Melchiorri  
*Nanoparticle Kinetics in Mesenchymal Stem Cells*  
Majors: Biomedical Engineering & English  
Mentor: Dr. Jose Assouline, Biomedical Engineering

75 - Brandon Menke  
*Eicosanoid Metabolism and Its Effect on PPAR $\gamma$  Activation*  
Majors: Biochemistry & Biology  
Mentor: Dr. Andrew Norris, Pediatrics

76 - John Carl Meusch  
*The Effect of Sitting Posture on Human Discomfort in Whole Body Vibration*  
Major: Biomedical Engineering  
Mentor: Dr. Salam Rahmatalla, Civil and Environmental Engineering

8 - Erin Kate Donohue  
*"Assessing Community Needs"*  
Majors: Business Management & Dance  
Mentor: Dr. Ken Brown, Management and Organizations

9 - Alex Leilani Einfeldt  
*Stimulation Enhances Limb Activity and Promotes Rapid Motor Learning in the Neonatal Rat*  
Major: Psychology  
Mentor: Dr. Scott R. Robinson, Psychology

10 - Kevin Vincent Flaherty  
*Long-term Changes in Prehistoric Hunting on the Great Plains (8000 -500 yrs ago): Trends in Diet Breadth and Human Impacts to Wildlife Populations.*  
Major: Anthropology  
Mentor: Dr. Matthew Hill, Anthropology

11 - Betsy Jean Fruechte  
*A Linguistic Look at Chile's "Casado con Hijos"*  
Majors: Spanish & English  
Mentor: Dr. Mercedes Nino-Murcia, Spanish

12 - Grace Gathua  
*Superhero*  
Major: Theatre Arts  
Mentor: Dr. Sydne Mahone, Theatre Arts

13 - Natasha Lynn Hovey  
*Iowa Juvenile Home*  
Major: Art & Interdepartmental Studies: Studio Art Management  
Mentor: Dr. Rachel Williams, Art Education

14 - Amanda Kay Irish  
*The Agricultural Workers' Role in Pandemic Avian Influenza Spread*  
Major: International Studies  
Mentor: Dr. Gregory Gray, Epidemiology

15 - Vanessa Ruth Jimenez  
*Influence of Positive Emotion on Attention Function*  
Major: Psychology  
Mentor: Dr. Shaun Vecera, Psychology

16 - Janice Jungmin Kim  
*The Role of the Perirhinal Cortex in Object-Place Paired Association.*  
Major: Psychology  
Mentor: Dr. Inah Lee, Psychology

17 - Katie Lynn Knoer  
*Capturing the Past: From Manuscript to Microfilm*  
Majors: History & French  
Mentor: Dr. Katherine Tachau, History

18 - Evan Koester  
*Modeling Spatiotemporal Traffic Flow*  
Major: Geography  
Mentor: Dr. Kathleen Stewart, Geography

19 - Cortney Kreimeyer  
*Examining the Emotional and Physiological Effects of Racial Misclassification on Caucasians*  
Major: Psychology  
Mentor: Dr. Mary Campbell, Sociology

20 - Emily Ladendorf  
*Getting Information About Academic Acceleration*  
Major: Psychology  
Mentors: Dr. David Lohman & Dr. Maureen Marron, Psychological and Quantitative Foundations

21 - Matthew Manning  
*Multiple Category Learning in Pigeons*  
Majors: Psychology & Anthropology  
Mentors: Dr. Edward Wasserman & Daniel Brooks, Psychology

22 - Rachael Frances Marie  
*Understanding Temporal Changes in Prairie and Agriculture*  
Majors: Geography & Informatics  
Mentor: Dr. Marc Linderman, Geography

23 - Elizabeth Ann Mawhiney  
*Reviving Ancient Rome*  
Major: Classical Languages  
Mentor: Dr. Carin Green, Classics

24 - Michael Sean McPartland  
*"The Development of Moral Cognition from Preschool to Early School Age".*  
Major: Psychology  
Mentor: Dr. Grazyna Kochanska, Psychology

\*25 - Kristen Ann Meylor  
*Hemingway the Cosmopolite: Written Codeswitching as Expression of Cultural Disorientation*  
Majors: Spanish & French  
Mentor: Dr. Peter Eubanks, French & Italian

26 - Sarah Lynn Mott  
*Maternal Post Adoption Well-Being and Adjustment*  
Major: Psychology  
Mentor: Dr. Mike O'Hara, Psychology

61 - Ryan V Jewell  
Major: Biology  
Darren Bryan  
Majors: Integrative Physiology & Pre-Medicine  
*Wash Your Vegetables: Lethality Studies in Herbicide Exposure on Super Oxide Dismutase Drosophila Mutants*  
Mentors: Dr. Atsushi Ueda & Dr. Chun-Fang Wu, Biology

62 - Hyun Jo  
*One-Step Chemo-Enzymatic Micro Synthesis of Reduced B-Nicotinamide Adenine Dinucleotide 2' Phosphate*  
Major: Health Science  
Mentor: Dr. Amnon Kohen, Chemistry

\*63 - Ross Daniel Johnson  
*Virtual Human Posture Prediction with Applied Loads*  
Major: Computer Engineering  
Mentors: Dr. Karim Abdel-Malek & Dr. Timothy Marler, Biomedical Engineering

64 - Nayeon Kang  
*Epoxide/Acrylate Hybrid Photopolymerizations: Synergy of the Dual Photoinitiator System*  
Majors: Chemical and Biochemical Engineering  
Mentors: Dr. Julie Jessop & Ho Seop Eom, Chemical and Biochemical Engineering

65 - Douglas Karkow  
*The Search for Ultra High Energy Neutrinos via Impacts with the Moon*  
Majors: Physics, Astronomy, & Mathematics  
Mentors: Dr. Robert Mutel & Theodore Jaeger, Physics and Astronomy

66 - Alexandra Barrett Keenan  
*Identification and characterization of secreted proteins of Leishmania chagasi*  
Majors: Biomedical Engineering, Biochemistry & International Studies  
Mentors: Dr. Mary Wilson & Dr. Sruti Debroy, Internal Medicine

67 - Kevin Kremer  
*Increasing Amounts of Ebola Virus Glycoprotein on the Surface of Ebola Virus Pseudo-typed Virions causes Transfection Efficiency to be Reduced*  
Major: Microbiology  
Mentor: Dr. Wendy Maury, Microbiology

53 - John Conley Foster  
*The Clear Creek Environmental Hydrologic Observatory*  
Major: Engineering  
Mentor: Dr. Craig Just, Environmental Engineering

54 - John Froehlig  
*Effects of Potassium Chloride on Calmodulin Mutants Defective in Ion Channel Regulation*  
Major: Biochemistry  
Mentor: Dr. Madeline Shea, Biochemistry

55 - Nick Geiger  
*Recovery of bimanual motor performance in monkeys*  
Major: Integrative Physiology  
Mentor: Dr. Warren Darling, Integrative Physiology

56 - Laboni Lipika Ghosh  
*Role of microRNAs in brain development*  
Major: Biochemistry  
Mentors: Dr. Beverly Davidson & Dr. Sarah Fineberg, Internal Medicine

57 - Esack Francis Grueskin  
*Body Mass Index (BMI) Misclassifications in Iowa City Area Police Officers*  
Major: Pre-Integrative Physiology  
Mentor: Dr. M. Kathleen Clark, Nursing

58 - Justin Jian Guan  
*Interactions of apo Calmodulin with Voltage-dependent Sodium Channel*  
Majors: Biomedical Engineering, Pre-medicine  
Mentors: Dr. Madeline Shea & Mike Feldkamp, Biochemistry

59 - Justin Wayne Hannon  
*McNary Dam Fish Passage*  
Major: Civil Engineering  
Mentor: Dr. Larry Weber, Civil Engineering

60 - Atulya S.R. Iyengar  
*Smell-O-Vision: In-flight Optical Control of Olfactory Receptor Neurons via Transgenic Expression of Channelrhodopsin-2*  
Majors: Biomedical Engineering & Biology  
Mentor: Dr. Chun-Fang Wu, Biology

27 - Veronica Mraz  
*Flaked Stone Artifacts at the Scott County Pueblo, Western Kansas*  
Major: Anthropology  
Mentors: Dr. Margaret Beck & Dr. Matthew Hill, Anthropology

28 - Ellis Miller Mumford  
*The Daily Palette*  
Major: Art History  
Mentor: Dr. Jon Winet, Intermedia

29 - Roberto Paniagua  
*A Look at Campus Climate at The University of Iowa*  
Majors: Political Science & Economics  
Mentor: Dr. Johnnie Sims, Center for Diversity and Enrichment

30 - Bethany Patten  
*Risk Attitudes in Two Big Ten Student Populations*  
Majors: International Studies & Economics  
Mentor: Dr. Gabriele Camera, Economics

31 - Lacey Jo Pavlovec  
*Gentlemen Prefer Brains: An Analysis of Men's Changing Mate Preferences Across Seven Decades*  
Major: Sociology  
Mentor: Dr. Christine B. Whelan, Sociology

32 - Marisol Victoria Pulido  
*Mexican Women In Iowa: The Untold Story*  
Majors: History & Secondary Education  
Mentor: Omar Valerio-Jimenez, History

33 - Sarah Raaii  
*Conjuring Abraham, Martin, and John: Memory, Myth and News of the Obama Presidential Campaign*  
Majors: Journalism and Mass Communication & Marketing  
Mentor: Dr. Dan Berkowitz, Journalism and Mass Communication

34 - Kayla Delores Resnick  
*Oneota Technological Adaptations to European Fur Trade Goods in Northwest Iowa*  
Major: Anthropology  
Mentor: Dr. John Doershuk, Archaeology & Office of the State Archaeologist

35 - Natalie Rupp  
*Behavioral Factors and Tumor Biomarkers in Ovarian Cancer Patients*  
Major: Biology  
Mentor: Dr. Susan Lutgendorf, Psychology

36 - Hannah Scates  
*Archaeological Reconstruction*  
Major: Anthropology  
Mentor: Dr. Russell Ciochon, Anthropology

37 - Raymond Philip Scheibel  
*Prevalence, Antibiotic Resistance, and Molecular Characterization of Staphylococcus Aureus in State Fair Swine*  
Major: Psychology  
Mentor: Tara Smith, Epidemiology

38 - Amy Schnitz  
*Plum Grove Farmstead Report*  
Major: Anthropology  
Mentor: Dr. Thomas Charlton, Anthropology

39 - Paul Joseph Skinner  
*Patterns of the Diffusion of Policy Innovations in the American States in the Twentieth Century*  
Major: Political Science  
Mentor: Dr. Frederick Boehmke, Political Science

40 - Chad Michael Steffens  
*Mechanical Icon*  
Major: European History  
Mentor: Dr. Marshall Poe, History

41 - Sarah Jayne Wittig Galgano  
*Barriers to Reintegration: The Effect of Race and Criminal Record on Employment Opportunities for Women*  
Majors: Sociology & Psychology  
Mentor: Dr. Mary Campbell, Sociology

## MATHEMATICS, ENGINEERING & NATURAL SCIENCES PRESENTERS

42 - Tricia Lynn Abernathy  
*Study of the Photo-degradation of Humic Substances in Presence of Nitric Acid*  
Major: Chemistry  
Mentors: Dr. Juan Navea, Dr. Vicki H. Grassian & Dr. Mark A. Young, Chemistry

43 - Varun Nikhil Batra  
*Myosin VII B in Drosophila melanogaster*  
Major: Biomedical Engineering  
Mentor: Dr. Dan Eberl, Biology

44 - Benjamin Micah Berkowitz  
*Interactive Computer Model of Cerebral Vasculature*  
Major: Biomedical Engineering  
Mentor: Dr. Madhavan Raghavan, Biomedical Engineering

45 - Collette Blake  
*The Effect of ZnO Nanoparticles on the Kinetics of Cationic Photopolymerization of Epoxides*  
Major: Chemical Engineering  
Mentors: Dr. Alec Scranton & Hoseop Eom, Chemical and Biochemical Engineering

46 - Matthew Donald Boddicker  
*No Strings Attached: Phase 3*  
Majors: Electrical Engineering, Mathematics, and Physics  
Mentor: Dr. David Andersen, Electrical Engineering

47 - Tyler Anthony Brown  
*Re-examining Body Weight Support Treadmill Training for Incomplete Spinal Cord Injured Patients. How Effective is It?*  
Major: Integrative Physiology  
Mentor: Dr. Michel Ladouceur, Integrative Physiology

48 - Samuel Turner Carrell  
*Strategies to Identify the Role of Nox4 in Vascular Cells*  
Major: Integrative Physiology  
Mentor: Dr. Francis Miller, Internal Medicine

\*49 - Maria R Drout  
*The Magnetized Interstellar Medium and Massive Star Formation in the Galactic Center*  
Majors: Physics & Astronomy  
Mentor: Dr. Cornelia Lang, Physics and Astronomy

50 - Kalyani Elinge Eko  
*Identification of Inhibitors of the Salmonella enterica serovar Typhimurium fimZ Gene, Which Regulates Adherence, Invasion, and Motility*  
Major: Microbiology  
Mentor: Dr. Bradley Jones, Microbiology

51 - Joshua Jennings Fajardo-Frink  
*Computing in Nanoelectronics*  
Major: Engineering  
Mentor: Dr. Jun Ni, Radiology

52 - Stephanie Nicole Fleckenstein  
*Groundwater Protein Extraction*  
Major: Environmental Engineering  
Mentor: Dr. Tim Mattes, Environmental Engineering