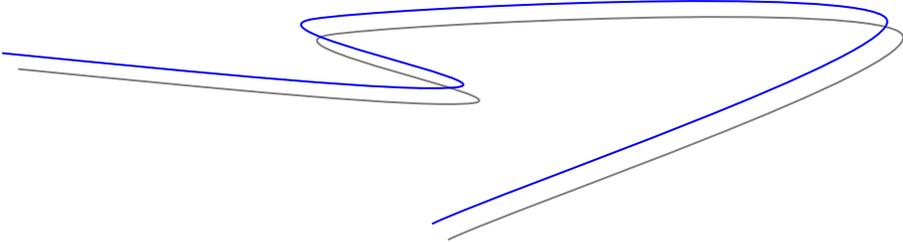




# *College of Arts and Sciences*

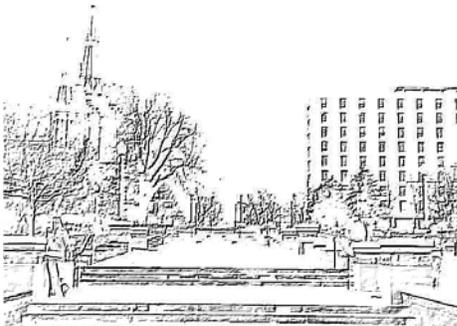
## HONORS PROGRAM

### RESEARCH PRESENTATIONS



Skutt Student Center Ballroom  
Monday, April 25, 2005  
3:00 P.M. - 6:00 P.M.

**Creighton**  
UNIVERSITY



## ***Research Presentation Schedule***

<b>Presenter</b>	<b>Presentation</b>	<b>Time</b>	<b>Section</b>
Rebecca Adams	Oral	3:15 - 3:30 p.m.	<b>1</b>
Benjamin Moore	Oral	3:15 - 3:30 p.m.	<b>3</b>
Grace Spulak	Oral	3:15 - 3:30 p.m.	<b>4</b>
Melissa Wilson	Oral	3:15 - 3:30 p.m.	<b>2</b>
Elizabeth Hunziker	Oral	3:45 - 4:00 p.m.	<b>1</b>
Michael Mao	Oral	3:45 - 4:00 p.m.	<b>2</b>
Kelsey Tinkum	Oral	3:45 - 4:00 p.m.	<b>4</b>
Justyna Dobrowolska	Oral	4:15 - 4:30 p.m.	<b>1</b>
Shennen Floy	Oral	4:15 - 4:30 p.m.	<b>3</b>
Nathan Sommer	Oral	4:15 - 4:30 p.m.	<b>2</b>
Andrew Lacroix	Oral	4:45 - 5:00 p.m.	<b>1</b>
Jennifer Larson	Oral	4:45 - 5:00 p.m.	<b>2</b>
Christopher Wachal	Oral	4:45 - 5:00 p.m.	<b>3</b>
Nicholas Glass	Poster	3:00 - 4:00 p.m.	<b>5</b>
Christina Rauzi	Poster	3:00 - 4:00 p.m.	<b>5</b>
Matthew Boylan	Poster	3:15 - 4:15 p.m.	<b>5</b>
Hannah Klasek	Poster	3:15 - 4:15 p.m.	<b>5</b>
Sarah Tielke	Poster	3:30 - 4:30 p.m.	<b>5</b>
Aaron Harper	Poster	4:00 - 5:00 p.m.	<b>5</b>
Bonnie Jacobsen	Poster	4:00 - 5:00 p.m.	<b>5</b>
Kelly Langan	Poster	4:00 - 5:00 p.m.	<b>5</b>
Michelle Schoonover	Poster	4:00 - 5:00 p.m.	<b>5</b>
Brittany Travers	Poster	4:00 - 5:00 p.m.	<b>5</b>

# Creighton UNIVERSITY

## COLLEGE OF ARTS AND SCIENCES HONORS PROGRAM RESEARCH PRESENTATIONS

Monday, April 25, 2005, 3:00 – 6:00 P.M.  
Skutt Student Center Ballroom

First Annual Honors Presentation Day



### *Table of Contents*

Opening Ceremony	
Dean Austin's Welcome	1
Program Administration	
Directors	5
Faculty Advisors	6
Student President	6
Honors Program	
Introduction	7
Curriculum Overview	8
Requirements	9
Research Presentation Abstracts	
Alphabetical order by Presenter's Last Name	9
Photo Album	19

## *A word from the Dean.....*

*“With Honors.*

*Just two small words, but they carry a lot of weight.*

*And where does that weight come from, precisely?*

*Academic administrators might want to argue that the worth of an honors program lies in its prescribed curriculum, in the small section sizes and in the heightened expectations for excellent work that are laid out in the Undergraduate Bulletin. Faculty members might suggest that it is the extra time and attention they devote to class preparation and to mentoring honors students that adds special value to the experience. Some schools go so far as to name their honors programs after distinguished historical figures as though doing so could bring new distinction to the diploma.*

*This booklet and this Honors Day, by contrast, reflect the true source of the "honor" that an Honors Degree represents: the commitment, dedication, and talent of its students. The work outlined in the abstracts on the pages that follow demonstrate convincingly that these young women and men have brought honor to themselves, to their peers and to the institution by investing in scholarship at an extraordinarily high level. While faculty advisors have challenged them, they in turn have challenged their own mentors. And the results are truly remarkable.*

*Under the circumstances, Creighton's conferral of a degree "with Honors" later this year can ultimately do no more than confirm publicly what is already self-evident.*

*My warmest congratulations to this year's class of Honors students!”*

*Timothy R. Austin*

*Dean*

*Creighton College of Arts and Sciences*

## *A word from the Director.....*

*“Welcome to the first annual Honors Day. This celebration is meant to display to the greater community some of the accomplishments of our graduating seniors. In the projects here represented you will also, we hope, detect several traits of the Program itself: its intellectual heterogeneity, its academic rigor, and its joyful pursuit of mental adventure. We are grateful to our graduates for all that they have done to make Creighton a place where faith and reason not only coexist, but flourish together, like the vine and the elm.”*

*Geoffrey Bakewell, Ph.D.*

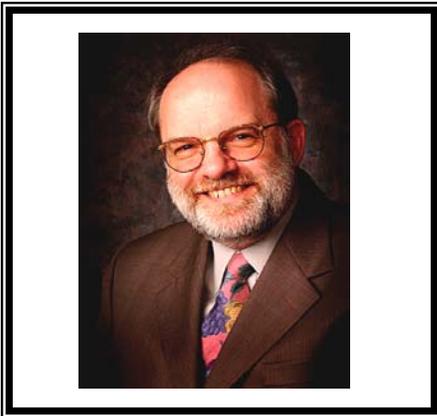
*Michael W. Barry Professor*

*Director of the Honors Program*

# CREIGHTON UNIVERSITY COLLEGE OF ARTS AND SCIENCES HONORS PROGRAM

## Program Administration

The Honors Program is under the supervision of the Dean of the College of Arts and Sciences, administered by the Director and the Assistant Director, who are advised by an Executive Advisory Board composed of faculty appointed by the Dean. The Student Honors Board serves as a liaison between program administrators and students and also plans activities for the honors program community. The newly established Advising Resource Center (ARC) located in the Hixson-Lied Science Building room G06, in addition to assisting the Director and Assistant Director of the Honors Program, provides resource information for Honors Students and Pre-Health Students about post-baccalaureate scholarships and medical school applications.



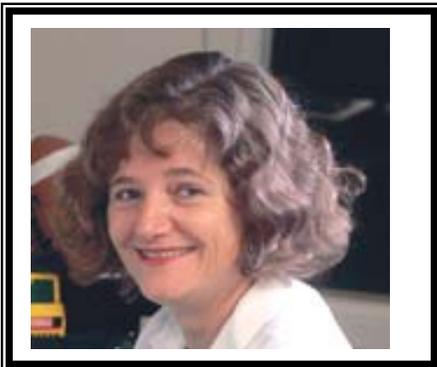
**Dr. Timothy R. Austin, Dean  
College of Arts & Sciences**

office: Administration Building  
phone: ext. 2431  
email: [traustin@creighton.edu](mailto:traustin@creighton.edu)



**Dr. Geoffrey Bakewell, Director  
Department of Classical & Near Eastern  
Studies**

office: Humanities Center 209  
phone: ext. 5526  
email: [gbakewe@creighton.edu](mailto:gbakewe@creighton.edu)



**Dr. Isabelle Cherney, Assistant  
Director**

Department of Psychology  
office: Hixson-Lied Science Building 308  
phone: ext. 1228  
email: [cherneyi@creighton.edu](mailto:cherneyi@creighton.edu)

## Faculty Advisory Board

<p><b>Dr. Terry D. Clark</b>            Department of Political Science            office: Admin 426A            phone: ext. 4712            email: tclark@creighton.edu</p>	<p><b>Dr. Joan M. Eckerson</b>            Exercise Science &amp; Athletic Training            office: Kiewit Fitness Center 227            phone: ext. 2090            email: eckerson@creighton.edu</p>
<p><b>Fr. J. William Harmless, S.J.</b>            Department of Theology            office: Humanities 132            phone: ext. 2572            email: wharmless@creighton.edu</p>	<p><b>Dr. Jeffrey P. Hause</b>            Department of Philosophy            office: Humanities 130            phone: ext. 3581            email: jphause@creighton.edu</p>
<p><b>Dr. Martin R. Hulce</b>            Department of Chemistry            office: Rigge Science 226            phone: ext. 2271            email: mhulce@creighton.edu</p>	<p><b>Dr. Marilyn A. Kielniarz</b>            Department of Fine and Performing Arts            office: Lied Center 101B            phone: ext. 2513            email: mkieln@creighton.edu</p>
<p><b>Dr. Harry Nickla</b>            Department of Biology            office: Hixson-Lied 424            phone: ext. 2157            email: hnickla@creighton.edu</p>	<p><b>Dr. Russell R. Reno</b>            Department of Theology            office: HC136            phone: ext. 2929            email: rrreno@creighton.edu</p>
<p><b>Dr. Janet E. Seger</b>            Department of Physics            office: Hixson-Lied G76            phone: ext. 4709            email: jseger@creighton.edu</p>	<p><b>Dusten Crichton</b>            Swanson Hall Director-Residence Life            office 119 Swanson            phone ext: 3196            email: dusten@creighton.edu</p>

The Student Honors Board is composed of students elected by fellow honors students.

The 2004 -- 2005 President is **Shennen Floy**.

Newly elected 2005 – 2006 President is **Brittany Travers**.



## **CREIGHTON UNIVERSITY COLLEGE OF ARTS AND SCIENCES HONORS PROGRAM**

The Creighton University College of Arts & Sciences recently approved a new curriculum for its Honors Program and will fully implement that curriculum for the first time in the 2005-2006 academic year.

Rooted in the university's Christian, Catholic, and Jesuit traditions, the new Honors Program relies on the belief, articulated by Pope John Paul II, that "the united endeavor of intelligence and faith will enable people to come to the full measure of their humanity." Its goal is to foster a community committed to the ongoing education of students and faculty members as fellow seekers for truth. The program seeks individuals of all faiths and backgrounds who are intelligent, well prepared academically, highly motivated, and academically adventurous. The curriculum then immerses these students in an academically rigorous but flexible program of study guided by a faculty mentor who is charged with paying special attention to the personal dimension of learning. The program ultimately understands itself as a fellowship of inquiry whose individual members have dedicated themselves without reserve to love of learning.

The Program is designed for talented, imaginative students desirous of participation in small, discussion-oriented classes and in courses on interdisciplinary and topical issues. It provides students with special opportunities and challenges to enhance their undergraduate experience and to contribute to the intellectual and cultural life of the University. The Program also offers eligible students the opportunity to pursue a course of study that complements their majors.

Criteria for admission to the Program include academic achievement and demonstrable interest in the Program's aims and aspirations. Required application materials include a piece of graded writing and an essay.

# CURRICULUM OVERVIEW

The new curriculum involves the following key elements:

**Foundational Sequence.** Honors students will take three courses (9 credits) in their first three semesters that introduce them to the Christian, Catholic, and Jesuit intellectual traditions that lie at the heart of a Creighton education within the context of Western civilization and of the pluralistic world we inhabit.

**Sources and Methods Courses.** Honors students will take five courses (15-20 credits) that induce them to think critically about information, assumptions, and arguments found in multiple forms of academic and cultural discourse. Several such courses will be offered each semester in a range of academic disciplines.

**Honors Senior Perspectives Course.** Honors students will be required to take a Senior Perspectives (SRP) course, and may select any such course offered in the College. Each year, however, one SRP will be designed for, and offered exclusively to, Honors students.

**Senior Independent Research Project.** Honors students will be required to demonstrate their capacity for advanced, self-directed, individual work by completing an approved project within their major(s). They will undertake these projects under the guidance of assigned faculty mentors and present their findings during a campus-wide “Honors Day.”

**Mentoring and Learning Plan.** All of the above elements will be incorporated into a Learning Plan, developed individually by Honors students in close consultation with a faculty mentor. The mentoring process will shape Honors students into confident, independent learners who take active roles in their own education, and expect the most of themselves. Through their individualized Learning Plans, Honors students will integrate their backgrounds and interests with the strengths and Mission of the University and the College. Their Learning Plans will be reviewed and approved by their faculty mentors and by the Program Director. While Honors students will be expected, therefore, to excel in all areas that characterize a Creighton undergraduate education, their fulfillment of these goals will be determined on an individual basis rather than by the more structured curricular requirements that apply to other students.

More detailed curricular information will be made available at the appropriate time to those students whose applications suggest that they would be strong candidates for admission to the program.

**Limited Tuition Waiver.** Honors students in good standing will not be charged tuition above and beyond the standard full-time tuition for a given semester, regardless of the number of credit hours they are taking. Their eligibility to register for more than 18 hours will still be subject to Dean’s Office approval in the same way as other students’.

## **REQUIREMENTS**

Good Standing. Once admitted to the Honors Program, students must continue to meet the following standards in order to remain in good standing in the program:

1. They must make acceptable progress towards fulfilling the requirements for an Honors Degree. Ordinarily, this means that they should have completed at least 6 credit hours of Honors courses by the end of their freshman year, 12 by the end of their sophomore year, and 18 by the end of their junior year.
2. They must maintain a QPA of at least 3.3 for all courses taken at Creighton.
3. They must maintain a QPA of at least 3.0 for all Honors courses taken at Creighton. (This Honors-specific QPA will not be computed until a student has completed at least two Honors courses.)

Honors students found not to be in good standing will be notified and given one semester to remedy the situation. Failure to do so may result in their dismissal from the Honors Program

### **High School Students**

Applications will be sent automatically to all freshmen admitted to the University who have an ACT composite score of at least 30 (or an SAT score of 1360) and a G.P.A. of at least 3.5. Students who desire admission to the Program should thus complete the customary application process for the University. They must subsequently submit a completed Honors Program Application Form, complete with a graded writing sample. Interested students should note that high achievement on standardized tests and in high school coursework do not guarantee acceptance into the Program. The writing sample should represent some of the student's best work. It should be the original or a photocopy of an essay, research paper, or creative project, and should include the instructor's comments and the grade earned.

### **Transfer Students and Creighton Undergraduates**

Transfer students and Creighton undergraduates are also eligible to participate in the Honors Program. Transfer students or students already enrolled at the University must have a minimum of a 3.5 G.P.A. earned in at least 30 and no more than 45 undergraduate hours. (Transfer students may be awarded Honors credit for honors work completed previous to their enrollment at Creighton.) Both transfer students and Creighton undergraduates should submit the Honors Program Application Form, complete with a graded writing sample and a transcript of their previous course work, to the Director of the Honors Program.

**Creighton University  
College of Arts & Sciences  
Honors Program**



**Honors Day  
April 25, 2005**

**Sponsored by the Office for Academic Affairs**

# **PRESENTATIONS** in alphabetical order by presenter's last name.

**Rebecca Adams**

**Oral Presentation: 3:15 p.m. – 3:30 p.m. Section 1**

**Faculty Sponsor: Dr. Arthur Douglas, Department of Atmospheric Sciences**

## **An Examination of the 22 May 2004 Hallam, Nebraska Tornado**

22 May 2004 brought a highly expected outbreak of severe weather, including over 50 tornadoes, to southern Nebraska and western and central Iowa. During this outbreak, a F4 tornado destroyed the town of Hallam, Nebraska during its 52 mile path length, resulting in 37 injuries and one fatality. As the threat of such an event was forecasted well in advance, this presentation focuses on what made this situation so identifiable as a dangerous one. That same night, another supercell tracked across south-central Nebraska, generating at least six weaker, short-track tornadoes from Furnas to Clay County. At times this supercell was separated from the Hallam supercell by less than a hundred miles. The differences in the convective mesoscale environments of the two supercells are examined in an attempt to infer why one produced such a more powerful outcome.

---

**Matthew Boylan**

**Poster Presentation: 4:00 p.m. 5:00 p.m.**

**Faculty Advisor: Dr. Jon-Paul Laventure, Dr. Anthony Bull, Dr. Stephen Lanspa, Dr. G. Patrick Lambert**

## **Comparison of the Effects of Aspirin and Ibuprofen on Gastrointestinal (GI) Permeability During Prolonged Exercise**

Eight runners (age =  $22.6 \pm 0.9$ ;  $VO_2$  max =  $61.8 \pm 2.0$  ml/kg/min) completed three (1/week) 60 min treadmill runs at 70%  $VO_2$  max. For the 24 h period prior to each run, subjects randomly ingested either 2 aspirin (A; 325 mg each), 2 ibuprofen (I; 200 mg each), or 2 placebo (P) capsules every 6 hours (10 capsules total). Immediately before each run, a solution (150 ml) containing 5 g sucrose (S), 5 g lactulose (L), and 2 g rhamnose<sup>®</sup> was ingested. Subjects also ingested water every 10 min during each run (males = 150 ml, females = 100ml). All urine produced during the run, and for 4 h after the run was collected to determine urinary S, L, and R.

---

**Justyna Dobrowolska**

**Slide Show Presentation: 4:15 p.m. - 4:30 p.m. Section 1**

**Faculty Sponsor: Dr. Cynthia Gibson, Department of Psychology**

### **Immunohistochemical Analysis of Amyloid Precursor Protein in the Hippocampus of Mice Following Repeated Mild Traumatic Brain Injuries**

The emergence of amyloid  $\beta$  plaques has been found in both Alzheimer's disease (AD) and traumatic brain injury (TBI), and there is some evidence that TBI increases the likelihood of later AD pathology. The amyloid  $\beta$  plaques are a result of the cleavage of amyloid precursor protein (APP) and are now known to be central to the degeneration of neurons during AD. A controlled animal model of repeated mild TBI and its relationship to APP has thus far not been examined. Therefore, this study examines the expression of APP staining 15 or 30 days post-injury in mice subjected to 0, 1, 4 or 6 mild TBI's. The results will discuss the comparison of APP expression among the experimental groups and the potential implications of any changes in APP expression.

---

**Shennen Floy**

**Oral presentation: 3:45 p.m. - 4:00 p.m. Section 3**

**Faculty Advisor: Dr. Julianne Strauss-Soukup, Department of Chemistry**

### **Structural Characterization of an Allosteric RNA Catalyst**

In nature, catalysts are used to expedite biochemical reactions and achieve specificity. Initially proteins were thought to be the only molecules that could act as biocatalysts and that nucleic acids served merely as information storage and transfer molecules in cells. This rationale has changed with the discovery of catalytic nucleic acids capable of folding to form active sites which promote chemical reactions. The structural conformation of catalytic nucleic acids has been shown to have a direct effect on the molecules in order to determine how they work. While there is a growing database of structures for naturally occurring catalytic RNA structures (ribozymes), very little structural data exists for many other nucleic acids. Crystalline structures of ribozymes provide a glimpse of how functional groups arrange for catalysis; however, structure can be directly connected to catalytic function by using the biochemical approach, Nucleotide Analogue Interference Mapping (NAIM). Of particular interest is the investigation of catalytically active structures of nucleic acid molecules in order to explore and predict structural motifs in these bimolecular, to understand how the molecules' structure affects function, and to elucidate mechanisms of certain chemical reactions. Many protein catalysts are subject to the binding of small molecules which are capable of large impact stimulatory or inhibitory catalytic activity. Similarly, tailor-made allosteric ribozymes can be used in a variety of applications including molecular detection and artificial control of cellular processes. In order to better understand RNA structure and conformational transitions which empower allosteric control of RNA catalysts, NAIM has been used to investigate the active structure of one such allosteric ribozyme. Results from NAIM will enable generation of a detailed structural model for the allosteric catalyst, providing a mechanistic view of the allosteric transition brought about by effectors binding, and contribute general knowledge that will be applicable to further RNA design and engineering strategies.

**Nicholas Glass**

**Poster Presentation: 3:00 p.m. – 4:00 p.m.**

**Faculty Advisor: Dr. L. Charles Murrin, Department of Pharmacology, UN College of Medicine**

**Acetyl cholinesterase Knockout Mice: Effects on Cortex and Alpha2 Adrenergic Receptors**

Acetyl cholinesterase (AChE) may contribute to the development of the intact nervous system. To characterize the role(s) of AChE in maturational processes, we examined differences which emerge between AChE knockouts and normal mice. We report varied expression of Alpha-2 adrenergic receptors in eight cerebral foci. Also detailed are discrepancies in thicknesses of the rostral cortex and coronal brain sections. Measurements of the normal mice consistently exceeded those from age-matched AChE knockout mice. Further examination of juvenile and adult animals is necessary to discern a mechanism of AChE action in the development of neural structure and function.

---

**Aaron Harper**

**Poster Presentation: 4:00 p.m. – 5:00 p.m.**

**Faculty Sponsor: Dr. Jeanne Schuler, Department of Philosophy**

**Finding Ethics in Legal Realism**

In the philosophy of law, the movement of Legal Realism developed as a response to positivism and natural law. One tenant of this is the Avoidance of Moralistic Language. However, avoiding moral norms is problematic for legal realists. The work of Edward Levi, as well as recent work in virtue ethics, helps to understand the place of morality in legal realism. It seems that ethics are most directly related to this legal philosophy in the actions of the judge. Here we can reconcile Ethics and Law, and find its relevance for our political decisions.

---

**Elizabeth Hunziker**

**Oral Presentation: 3:45 p.m. – 4:00 p.m. Section 1**

**Faculty Sponsor: Dr. Matthew Huss, Department of Psychology**

**Self-Objectification, Anxiety and Depression in Female and Male College Students**

Objectification Theory proposes that society's objectification of women can lead women to have an observer's perspective of their own bodies, or self-objectify. Few prior studies of self-objectification have included men. This study examined the relationship between self-objectification and appearance anxiety, depression, general anxiety, self-esteem, gender and gender roles in 53 male and 69 female college students. In an examination of only the female participants, positive relationships were found between self-objectification and appearance anxiety and general anxiety, and a negative relationship was found between self-objectification and depression. For male participants, no significant relationships were found. These findings suggest that self-objectification may have some negative effects for women.

---

**Bonnie Jacobsen**

**Poster Presentation: 4:00 p.m. – 5:00 p.m.**

**Faculty Advisor: Dr. Michael Brown, Department of Philosophy**

### **Ontology of Fictional Objects**

My research is an attempt to formulate the question about the metaphysical status of fictional objects, particularly of fictional characters. How do fictional entities exist? I explore various answers to the question, and in the process, critique each response with respect to the assumptions and consequences of each view in its larger metaphysical framework. By looking at various perspectives, I clarify the question and its significance for a broader metaphysical understanding of the world.

---

**Hannah Klasek**

**Poster Presentation: 3:15 p.m. – 4:15 p.m.**

**Faculty Advisor: Dr. Alistair Cullum, Department of Biology**

### **The Evolutionary Responses to pH Stress in Escherichia Coli**

In this study, we have used Escherichia coli to examine evolutionary responses to changes in pH stress. The expectation is that over time in the new environment, fitness of the lineage will increase as adaptation to these different environments should decrease metabolic costs of maintenance and allow for better growth. The ancestral genotype has been evolved for 2000 generations at pH 7.2. Experimental lines were placed in either a pH of 5.4 or a pH of 8 and allowed to evolve for 2000 generations. Competition experiments between these ancestral and experimental lines allowed us to determine the change in fitness in the new environments.

---

**Andrew LaCroix**

**Oral Presentation: 4:45 p.m. – 5:00 p.m. Section 1**

**Faculty Sponsor: Fr. Thomas McShane, Department of Physics**

### **Phase Transitions: Discontinuity Modeled by Discrete Components**

Any system that exhibits a discontinuity in properties is a phase transition. May physical properties such as a transition from liquid to solid or percolation of a system demonstrate such properties? I model phase transitions using simple computer programming called cellular automata. Cellular automata allow exploration of complex systems since they operate on simple, discrete rules. A benefit of using cellular automata is that they respond highly to initial conditions so they are flexible for a variety of problems.

---

**Kelly Langan**

**Display Poster: 4:00 p.m. – 5:00 p.m.**

**Faculty Advisor: Dr. Theodore Burk, Department of Biology**

### **Butterfly Nectar Usage at Two Eastern Nebraska Prairies**

We conducted standard Pollard Transects to census butterfly populations in eastern Nebraska throughout the summers of 2002, 2003, and 2004. Surveys were conducted weekly at two Omaha sites, Allwine Prairie (a restored prairie) and Bauermeister Prairie (a prairie remnant). While conducting these surveys, we recorded all instances of nectar feeding by the butterflies observed, noting the species of butterfly as well as that of the nectar plant. We present information on the nectar plants used by butterfly species of interest, the community of butterflies observed nectaring on individual plant species, and the influence of particular plant characteristics on butterfly preference.

---

**Jennifer M. Larson**

**Oral Presentation: 4:45 – 5:00 p.m. Section 2**

**Faculty Advisor: Dr. Terry D. Clark, Department of Political Sciences**

### **Geometric Models of Political Systems: The Strength of the Presidency in Premier-Presidentialism**

Drawing heavily from game theory, set theory, geometry, fuzzy logic and probability theory, political science intersects with mathematics in the modeling of political systems. Drawing from George Tsebelis' concept of veto players, we model the premier-presidential Lithuanian political system from 1993-2004. Our models account for the powers of veto and legislative proposal to show that despite the apparent limitations of a president's power in premier-presidential systems, the president remains a politically salient actor. A number of theoretical contributions are presented in our research, including an estimation of collective preference regions in Euclidean space which we call variance circles.

---

**Michael Mao**

**Oral Presentation: 4:00 p.m. – 4:15 p.m.**

**Faculty Advisor: Dr. Martin Hulce, Department of Chemistry**

### **A Synthesis of 4-Benzyl-L-Histidine**

In order to confirm the spectroscopically assigned structure of the potent calcitonin gene-related peptide (CGRP) antagonist Ny-benzl-(4-benzyl) His<sup>10</sup>-CCGRP(8-37), a synthesis of 4-benzyl-L-histidine was undertaken. A mixture of diastereomeric 4-phenylspinacines was formed by Pictet-Spengler reaction of benzaldehyde with L-histidine. Either diastereomer or their mixture can be hydrogenated to provide 4-benzyl-L-histidine as a diacetate syrup. Lyophilization twice from 1 molar hydrochloric acid resulted in the solid 4-benzyl-L-histidine dihydrochloride. This rapid approach to the synthesis of 4-substituted histidines has implications for the preparation of conformationally restricted histidine analogues.

**Benjamin Moore**

**Oral Presentation: 3:15 p.m. – 3:30 p.m. Section 3**

**Faculty Advisor: Dr. Devendra Agrawal, Department of Bio-Medical Sciences**

### **SOCS Expression in Human Eosinophils**

This project examines the expression of SOCS proteins in human eosinophils isolated from the blood and incubated in conditions that simulate either an allergic asthmatic condition or a non-asthmatic condition.

---

**Christina Rauzi**

**Poster Presentation: 3:00 p.m. – 4:00 p.m.**

**Faculty Advisor: Dr. Mark Reedy, Department of Biology**

### **TIMP-2mRNA Expression in Early Chick Embryos**

Cell movement and morphogenesis are a crucial part of embryo development, and errors in morphogenesis often cause fatal defects. Tissue inhibitor of metalloproteinase-2 (TIMP-2) is one of the many factors that contribute to morphogenesis. Previous research has shown TIMP-2 to be expressed in stage 11 chick embryos but much less is known about TIMP-2 expression during other early embryo stages. I used in situ hybridization with a labeled antisense probe to detect TIMP-2 mRNA expression in various early embryo stages and sectioned the embryos to further examine expression in various embryo structures.

---

**Michelle Schoonover**

**Poster Presentation: 4:00 p.m. – 5:00 p.m.**

**Faculty Sponsor: Dr. Cheng Kao (Texas A&M University)**

### **An Examination of an Active Site Residue of the Hepatitis C Virus RNA-dependent RNA-polymerase**

The Hepatitis C virus NS5B protein is a RdRp that is responsible for HCV genome replication by catalyzing phosphodiester bond formation. Aspartate residue 225 (D225) is particularly important in nucleotide polymerization because it discriminates between NTPs and dNTPs. Previous work has shown that mutating D225 to alanine affected the normal activities of the HCV RdRp. To further characterize D225A's binding to NTPs without interference from spectral properties of NTPs, a tetracysteine motif (TCM) is inserted at the C-terminus of the D225A protein. The TCM binds to the fluorescent arsenical hairpin binder (FIAsH). The fluorescence intensity of the TCM-tagged D225A in complex with FIAsH were measured with increasing concentrations of NTP in the presence of either Mg<sup>2+</sup> or Mn<sup>2+</sup>. The binding isotherms were utilized to determine the binding affinity of the NTPs to the protein and allow comparison to the wild type protein tagged with TCM. The results from these binding experiments will be discussed in relation to wild type protein and initiation of RNA synthesis.

**Chris Wachal**

**Oral Presentation: 4:45 p.m. – 5:00 p.m. Fourth Section**

**Faculty Advisor: Dr. Greg Zacharias, Department of English**

**Holy Ground: Selections from Oscar Wilde's Prison Correspondence, September 1896 – May 1897**

This collection of Oscar Wilde's prison correspondence presents a new picture of the end of Wilde's years at Reading Gaol. Recent biographies, especially Joseph Pearce's *The Unmasking of Oscar Wilde*, have emphasized Wilde's personal spirituality and Catholicism. This collection, the first to focus exclusively on the period in which Wilde composed *De Profundis*, unveils the Wilde struggling with everyday problems— his divorce settlement, getting paid for his work, visits from friends. The picture presented is that of Wilde the populist, Wilde the humanist – that side rarely presented by literary biographies more concerned with Wilde's elite ties and bourgeois tastes.

---

**Nathan Sommer**

**Oral Presentation: 4:45 – 5:00 p.m. Section 3**

**Faculty Advisor: Dr. Robert Chatterton, Northwestern Medical School**

**Breast Cancer Research: A Lifestyle Study**

Breast density has a high correlation with breast cancer because high breast density is the best indicator we currently have of breast cancer. Progesterone and estradiol have been shown to have a correlation between hormone levels and breast density. Higher levels of both are generally correlated with increased breast density. I am looking at the effect of different lifestyles upon hormone levels. I am particularly looking at physical activity levels and calorie intake among women, and then analyzing hormone levels in saliva samples from the subjects.

---

**Grace Spulak**

**Oral Presentation: 3:15 p.m. – 3:30 p.m. Section 4**

**Faculty Advisor: Mary Helen Stefaniak, Department of English**

**Get Thee Up Into the High Mountain: A Collection of Creative Work**

This project puts together a collection of writing representing the best creative work that I can produce at my level of ability, reflecting my understanding of the basic elements of fiction and poetry. This project particularly focuses on synthesizing the basic elements of writing such as imagery and diction with both the structural considerations of fiction such as the arrangement of scene and narrative as well as with the formal considerations of poetry.

---

**Sarah Tielke**

**Poster Presentation: 3:30 p.m. – 4:30 p.m.**

**Faculty Sponsor: Dr. Mark Reedy, Department of Biology**

**Developing Techniques for Studying Regulatory Mechanisms Involved in Neural Crest Cell Formation.**

The goal of my research was to develop a technique to be used in studying the regulatory mechanisms involved in neural crest cell formation. A reporter construct was injected into the neural tube of developing chicken embryos that contained the *Foxd3* gene from *Amphioxus*, a gene involved in neural crest cell formation in vertebrates. The chicken embryos were then collected and examined for reporter gene expression and GFP expression, which indicates that gene transduction was successful.

---

**Kelsey Tinkum**

**Oral Presentation: 3:45 – 4:00 p.m. Section 4**

**Faculty Sponsor: Dr. Taghrid B. El-Abaseri, Dr. Garrett Soukup, Dr. Laura A. Hansen, Bio-Medical Sciences**

**EGFR and erbB2 Receptor Tyrosine Kinase Targeted siRNA Decreases Receptor Expression**

Ultraviolet (UV) irradiation, usually sun exposure, is the leading cause of skin cancer. Inhibition of the erbB receptor tyrosine kinases epidermal growth factor receptor (EGFR) and erbB2 prior to UV exposure suppresses tumorigenesis in mouse skin. We hypothesized that small interfering RNA (siRNA) could reduce EGFR and erbB2 expression in cultured cells and avoid the nonspecific effects of the inhibitors. Cells were transfected with EGFR or erbB2 siRNA and erbB expression and activity assessed. The targeted siRNA reduced EGFR and erbB2 expression and activity specifically. We propose that RNA interference is a useful technique for modulating erbB receptor activity.

---

**Brittany Travers**

**Poster presentation: 4:00 p.m. – 5:00 p.m.**

**Faculty Sponsor: Dr. Isabelle Cherney, Department of Psychology**

**In the Best Interest of the Child: Adult Perceptions of Children's Rights**

The United Nations' Convention on the Rights of the Child is the most widely ratified international human rights document despite the lack of research examining children's rights and diverse cultural interpretations of these rights. Especially important in understanding children's rights are the perspectives of adults. A sample of 325 adults from the USA, England, Spain, and Switzerland were given a four-part questionnaire that consisted of vignettes examining ten subtypes of children's rights and questions examining children's competence. Significant differences were found in terms of culture, religion, and political affiliation for numerous rights including privacy, sexual conduct, and political participation.

**Melissa Wilson**

**Oral presentation: 3:15 p.m. – 3:30 p.m. Section 2**

**Faculty Advisor(s): Dr. Bo Deng (UNL), Dr. Lance Nielsen (CU), Department of Mathematics**

**A Stoichiometric Tumor Model: Phosphorus Flow**

A mathematical model following the flow of phosphorus through the body and the progression of a tumorous cancer. The stoichiometric nature of the model is conducive to a holistic understanding of cancer. Both human immune response and angiogenesis are included in the model to more accurately describe the growth of the tumor. The model is set up such that limiting nutrients may be interchanged and parameterization allows identification of both necessary and superfluous data.

---

# Honors Members Volunteering at Joslyn Elementary School (*Omaha Public School System*)



Brandon Hankey & James Anderson



Mark Rusch & Mary Johnson



**Honors Freshman Seminar – Fall 2003**



**Jenn Larson at the Spring BBQ, April 2004**



