Ninth Annual

Undergraduate Research and Creative Achievement Day
April 27, 2005

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April 27, 2005

Dear Participants and Visitors,

I am pleased to welcome you to UMBC's ninth annual Undergraduate Research & Creative Achievement Day. This year, as in the past, we showcase diverse and timely presentations from a wide variety of disciplines. Whether focusing on immigration through the port of Baltimore at the tum of the last century, the Czech and Slovak Republics in the European Union, artificial blood based on cell-free hemoglobin, or exploring social issues through music, you will be sure to find many subjects of interest. It will also be our pleasure today to introduce our new class of Undergraduate Research Award recipients. These 26 students will receive a total of more than $37,000 to pursue independent research over the next 12 months. They have proposed research in the arts, engineering, humanities, mathematics, sciences, and social sciences. They were selected from an applicant pool of78 undergraduates-one of the largest in the 10-year history of this program at UMBC.

Consistent with President Hrabowski's commitment to increasing the number of prestigious scholarship awards for UMBC students, we are seeing the additional benefit of undergraduate research in that it helps prepare students to compete successfully for major awards such as the Fulbright, Truman, and Goldwater scholarships. Among today's presenters are a 2004 recipient of the Barry Goldwater Scholarship and a finalist in the 2005 Marshall Scholarship competition. In this program book you will find a listing of many of the honors and awards that members of this talented group of students have earned to date.

A special note to our participants, especially to those who will be graduating next month. Stay in touch! Let us know of the continuation of your research as graduate students and as professionals. We are proud and confident that the research and creative achievement that you recount, exhibit, and perform for us today will give you the foundation to be highly successful in future endeavors. Alumni who participated in this program in past years tell us that the experience has had lasting and meaningful value.

Thank you to all who joined us here today. We appreciate the support of the faculty who have taught and mentored these students and of the family and friends who have supported them throughout their education. We are proud of the many accomplishments on display today and look forward to this day of celebration.

Arthur T. Johnson
Provost

Schedule of Events

8:45 a.m. - 9:00 a.m.	**Welcome**, Room 767, Albin O. Kuhn Library & Gallery Arthur T. lolmson, Provost
9:00 a.m. - 1:00 p.m.	**Concurrent Sessions** **Oral Presentations & Musical Performances**, Room 767 **Faculty Moderators:** Vincent Grabill, Department of Visual Arts Cynthia Hody, Department of Political Science Michelle Scott, Department of History Christoph Innscher, Department of English **Poster Presentations**, 7h floor, Library **Additional Fine Arts Exhibits,** 2nd floor, The Commons and Hallway Gallery: 1st floor, Fine Arts
1:00 p.m. - 2:00 p.m.	**Plenary Session**, Room 767 **Remarks by:** Arthur T. lohnson, Provost **Faculty Guest Speakers:** Zoe S. Warwick, Department of Psychology Christel N. Temple, Department of Africana Studies **Introduction of the 2005-2006 Undergraduate Research Award Recipients** Diane M. Lee, Vice Provost for Undergraduate and Professional Education Victor Wexler, Associate Dean, College of Arts & Sciences
2:00 p.m. -3:30 p.m.	**Reception with Refreshments** 7th Floor, Albin O. Kuhn Library and Gallery

The 2004 - 2005 Provost's
Undergraduate Research & Creative Achievement Day Committee

Joseph (Skip) Morin, Chair
Assistant Professor, Music

Guenet Abraham
Assistant Professor, Visual Arts

Julie Fette
Assistant Professor, Modem Languages & Linguistics

Stephen M. Miller
Assistant Professor, Biological Sciences

Susan Minkoff
Assistant Professor, Mathematics

Sara Poggio
Associate Professor, Modem Languages & Linguistics

Anna Rubin
Director, Linehan Artist Scholars Program & InterArts Studies Program

Cindy Schaeffer
Assistant Professor, Psychology

Kathy Sutphin
Coordinator of Special Projects

Biological Sciences
Tim Topoleski
Professor, Mechanical Engineering

Teresa Viancour
Associate Professor, Biological Sciences

Victoria Yoon
Associate Professor, Information Systems

Staff to the Committee
Janet McGlynn
Office of the Provost

Nancy L. Miller
Office of the President

Acknowledgments

The organizing committee would like to express its gratitude to the many people who helped make this day possible. First and foremost, we thank the student participants whose talent and dedication inspire the entire event. Provost Arthur Johnson, whose endorsement continues to make possible DRCAD and other initiatives in undergraduate research, deserves our special appreciation. Almost everyone in the Office of the Provost was involved in some way in the preparations for DRCAD 2005. We are grateful for the leadership provided by Diane Lee, Vice Provost for Undergraduate and Professional Education. Janet McGlynn was tireless in her role as overall staff coordinator of both DRCAD and URA this year. Lynn Zimmerman, Vice Provost for Academic Initiatives, and Jill Randles, Assistant Vice Provost for Undergraduate Education also provided important support to the effort. Provost's Office staff members Linda Hatmaker, Sue McMillian, Susan Mocko, Barbara Smith, and Andrea DeSantis provided essential administrative support to this event, as did student assistants Katie Siemer, Rebecca Holsinger, Venize Luceriago, Danielle Williamson, and Christel Mercado. Graduate Assistant Victoria Crane was involved in both URCAD and URA from beginning to end this year, carrying out duties too numerous to list. We gratefully thank Beth Pennington, long time URCAD coordinator, now teaching in Florida, for her longdistance advice throughout the preparations for today.

We are indebted to many UMBC faculty members from a wide range of departments whose collaboration in the event is essential to its success. At the top of the list are the faculty who serve as advisors to individual students and those who serve on the URCAD committee, listed on page six. Music faculty member Joseph Morin stepped up to chair the committee this year. Committee members Tim Topeleski and Steve Miller deserve special thanks for conducting preparation sessions for oral presenters and poster presenters, respectively. We also appreciate the tremendous effort made by members of the Undergraduate Research Awards Committee to screen applications and identify many of the talented students featured in each year's event. Last year's URA committee, whose reviews have contributed to selecting today's participants, included: Guenet Abraham, R. Scott Cost, Nessly C. Craig, Julie Fette, Stephen M. Miller, Joseph Morin, Beth Pennington, Manil Suri, Anna Rubin, Tim Topoleski, and Victor Wexler. For their assistance in moderating today's oral presentations, we thank faculty members Vincent Grabill, Cynthia Hody, Michelle Scott, and Christoph Irmscher. We look forward to the remarks of faculty guest speakers Zoe S. Warwick and Christel N. Temple. Victor Wexler played his usual important role in facilitating the recruitment of speakers, encouraging faculty participation, and otherwise pitching in as needed.

Many others at UMBC played an important part in DRCAD. Kathy Sutphin not only served on the URCAD committee, but was invaluable in helping keep updated DRCAD information on the UMBC web site and in providing useful institutional memory all along the way. Among the many individuals who have assisted in the publicity and other arrangements for this event are Lisa Akchin, Sara Sommerville, Eleanor Lewis, Helen Garland, Laura Matteoni, and Ramona Arthur. We thank Larry Wilt, Linda Durkos, Tom Beck, Cynthia Wayne, and Peggy Major for facilitating our use of the Albin O. Kuhn Library & Gallery. We are grateful to Tim Sparklin for making sure that all projects have followed guidelines of the Institutional Review Board and to the staff of the Registrar's Office for providing required transcripts for URA applications. Sandy Tabler provided very helpful on-site support. Sue Vacca and the staff of Wood Food Service have worked hard to provide an enjoyable reception. Brian Shipley, Ron Hamilton, and the Student Workforce staff provide unseen but vital support to this event. The help of Audio-Visual Services is always crucial to our presentations, and we thank Steve Anderson and his staff for their reassuring assistance for the technical aspects of today's presentations. Thanks also to Troy White and the staff from Physical Plant for their great help in installing the banners and signs throughout campus.

We salute the student editors of our undergraduate research journal, the UMBC Review: Beth Varden, Scott White (text editors), Michael Dorsey, and Christine Giberson (design editors). Credit is also due to student advisor Rachel Lucke, faculty advisor Marjoleine Kars, and faculty graphic arts consultant Guenet Abraham for their long hours and hard work on this sixth edition.

These acknowledgments would be incomplete without expressing thanks for the spirited leadership of President Freeman Hrabowski, whose relentless cheerleading for UMBC students in their academic endeavors is perfectly reflected in this celebration of student achievement. Nancy L. Miller of the President's office played a significant role in processing URCAD applications, providing support to the faculty committee, and producing and editing the program. Additional support provided by members of the President's Office is also very much appreciated.

We extend a final word of thanks to the family and friends who, with loyalty and pride, have come to hear a special presenter. Your encouragement is noticed and appreciated by the students presenting today and also by the faculty and staff who organized the event. Thank you for attending.

URCAD Oral Presentations & Musical Performances

8:45 a.m. Welcome and Opening Remarks
Professor Arthur T. Johnson, Provost
Room 767, Albin O. Kuhn Library

Session I:

9 a.m. **Jeffrey A. Jordan** — Visual Arts
Undergraduate Research Award Scholar
"Short Film in the Genre of Suspense"
Professor Vincent Grabill, Advisor
(A second screening of this film will be offered at 2:30 p.m., during the reception.)

9:15 a.m. **Sarah Husain** — History
Undergraduate Research Award Scholar
"History, Society, and Culture in Baltimore-Washington Mosques"
Professor John Birkenmeier, Advisor

9:30 a.m. **Eric J. Montgomery** — Optical Engineering/Interdisciplinary Studies
"Bright, Narrowband, Portable Entangled Photon Source and Detection System"
Professor Yanhua Shih, Advisor

9:45 a.m. **Christie M. Finn** — Music
Undergraduate Research Award Scholar
"A New Approach to Opera: Discovering Handel's Gems"
Professor David Smith, Advisor

Session II:

10 a.m. **Viktoriya Mikityanskaya** — Political Science
"International Law: More than Just a Paper Tiger among Major Powers?"
Professor Jeffrey Davis, Advisor

10:15 a.m. **Aaron F. Ralby** — English
Undergraduate Research Award Scholar
"Yeats's 'Lapis Lazuli': From Mage to Mystic"
Professor Raphael Falco, Advisor

10:30 a.m. **Rachel A. Abarbanel** — Information Systems
"Evaluating Instructional Techniques to Facilitate Learning Java Programming"
Professor Henry H. Emurian, Advisor

10:45 a.m. **Laura Marshallsay** — History
Undergraduate Research Award Scholar
"Immigration Through the Port of Baltimore: 1868-1914"
Professor Michelle Scott, Advisor

Session III:

11. a.m. **Shayla H. Donmoyer** Musicology
"Beyond the Sensationalist Story: Analyzing the Works of Germaine Tailieferre"
Professor Linda Dusman, Advisor

11:15 a.m. **Lawrence Akebe Fomundam** Computer Engineering/Mathematics
Undergraduate Research Award Scholar
"Modeling Uncertainty in Optical Communication Systems"
Professor John Zweck, Advisor

11:30 a.m. **Gregory Lowe** Political Science
"Eliminating the Rub: Challenges and Solutions for Designing a Common Agricultural Policy that Complements Development Policy in the European Union"
Professor Cynthia Hody, Advisor

11:45 a.m. **Mary E. Potorti** American Studies
"Constructions of Masculinity in Vietnam War Rims"
Professor Dabrina A. Taylor, Advisor

Session IV:

12 p.m. **Scott White** English
Undergraduate Research Award Scholar
"Echoes from Margaret Fuller's Conversation: Woman in the 19th Century and Fuller's Modern Appeal"
Professor Christoph Irmscher, Advisor

12:15 p.m. **Margaret Dabek** Biochemistry and Molecular Biology
"Artificial Blood Based on Cell-Free Hemoglobin"
Professor Ramachandra S. Hosmane, Advisor

12:30 p.m. **Erum F. Marfani** Political Science
"Determining Causes of Global Labor Trafficking: A Procedural Dilemma"
Professor Cynthia A. Hody, Advisor

12:45 p.m. **Rachele Sills** Music
Undergraduate Research Award Scholar
"Becoming an Inspiring Violinist and Teacher"
Professor Airi Yoshioka, Advisor

Poster Presentations

All poster presentations will be available for viewing from 8:30 a.m. to 3:30 p.m. on the seventh floor of the library. Student researchers will be available for discussion of their work in two sessions, as noted.

Poster Session I: 9 - 11 a.m.

Patrick J. Arnold History Poster #21
"Comparative Political Culture and Election Outcomes in New Hampshire and Vermont, 1976-2000"
Professor John W. Jeffries, Advisor

Maurisa P. Blackman Psychology Poster #41
"Predicting Fruit and Vegetable Consumption in a Resident College Population"
Professor Carlo DiClemente, Advisor

Melissa P. Blackman Biological Sciences Poster #20
"Characterization of Human Cone Specific Arrestin Binding in the Deactivation of Phototransduction"
Professor Phyllis Robinson, Advisor

Robert W. Crow Political Science Poster #39
"Safe at Home: The Effects of Pearl Harbor and September 11 on Surveillance Policy in America"
Professor Carol Barner-Barry, Advisor

Hadi P. Gharabaghi Visual Arts Poster #4
Undergraduate Research Award Scholar
"'Where is My Friend's House?' Postmodernism, Immigration and Iranian Identity"
Professor Preminda Jacob, Advisor

Thomas Hsu Biochemical Engineering Poster #30
"Recombinant Membrane-Bound Receptors as Novel Biosensors"
Professor Leah Tolosa, Advisor

Elizabeth M. Humphries Biological Sciences Poster #43
Undergraduate Research Award Scholar
"Shouldn't Every Species Have Its Own DNA? Exploring DNA Sharing Using the White Goose Complex"
Professor Kevin E. Omland, Advisor

Kathleen B. Kaluhiokalani Political Science Poster #38
"Brown v. Board of Education: Was it Enough?"
Professor Carol Barner-Barry, Advisor

Erin Loeliger Biochemistry and Molecular Biology Poster #13
"Unusual Occurrences: Effect of HIV-1 Matrix Mutations on Myristate Exposure"
Professor Michael Summers, Advisor

Anne Logie Biological Sciences Poster #12
"A Preliminary Analysis of Feather Microbial Communities on New World Passerines"
Professor Kevin Omland, Advisor

Chad McCormick Biochemistry and Molecular Biology Poster #8
Undergraduate Research Award Scholar
"Rapid Identification of HIV Drug-Resistant Strains by Electrospray Ionization Fourier Transform Mass Spectrometry (ESI-FTMS)"
Professor Daniele Fabris, Faculty Advisor

Poster Session I: 9 11 a.m.

Nayan Patel Biochemistry and Molecular Biology Poster #24
"Role of Zebrafish N-Cahderin in Neurogenesis"
Professor Rachel Brewster, Advisor

Faith Perfecto American Studies Poster #9
"What's Wax Got To Do With It? Authenticity and Representation at the Great Blacks in Wax Museum"
Professor Patrice McDermott, Advisor

Natalie Podrazik Computer Science Poster #11
"FMetaCost: Calculating the Cost of Misclassification in Machine Learning Based on the Features of an Instance"
Professor Marie desJardins, Advisor

Daniel Smyth Political Science Poster #37
"Cote d'ivoire and Pakistan: The Crippling Effects of Military Coup Regime Transitions on Judicial Human Rights Protection"
Professor Jeffrey Davis, Advisor

Elena Spieker Psychology Poster #1
"Feeling 'Full': What Aspects of Food Enhance Satiety?"
Professor Zoe S. Warwick, Advisor

Ian Tracy Biological Sciences Poster #6
"Defining Species Limits Through Color: Analysis of the Orchard Oriole Complex"
Professor Kevin Omland, Advisor

Carlos A. Uquillas Biological Sciences Poster #27
"The Role of Olfaction in Insect Feeding Behavior"
Professor Frank Hanson, Advisor

Eric Valentine Mathematical Finance Poster #23
Undergraduate Research Award Scholar
"Stochastic Process Models in Option Pricing"
Professor Muruhan Rathinam, Advisor

Sabrina Walborn Biological Sciences Poster #26
"Cloning and Expressing the Saccharomyces Cerevisiae Ribosomal L4 Protein in Escherichia Coli"
Professor Janice Zengel, Advisor

Stefanie E. Watson Music Poster #31
Undergraduate Research Award Scholar
"The Empowered Accompanist: A Collaborative Pianist's Study of Copland Songs"
Professor Rachel Franklin, Advisor

Aye T. Win Biochemistry and Molecular Biology Poster #33
Undergraduate Research Award Scholar
"Kinetic Studies on Conformational Change of Gene 32 Protein"
Professor Richard Karpel, Advisor

Poster Session II: 11 a.m. - 1 p.m.

Benjamin S. Alpert Political Science Poster #34
"The Case of Yaser Hamdi: Evaluating the Legal Status of U.S. Citizens Held as Enemy Combatants"
Professor Carol Barner-Barry, Advisor

Cindy R. Claros Visual Arts Poster #15
Undergraduate Research Award Scholar
"Identity Matters: Contemporary Mexican Art in the U.S. and Mexico"
Professor Preminda Jacob, Advisor

James E. Dorsey IV Music Poster #25
Undergraduate Research Award Scholar
"Exploring Social Issues Through Music: An Album"
Professor William Kemp, Advisor

Steven E. Ellis Mathematics Poster #36
Undergraduate Research Award Scholar
"Implementation of a Cutting Plane Algorithm for DC Optimization"
Professor Madhu Nayakkankuppam, Advisor

Corey A. Fleischer Mechanical Engineering Poster #3
Undergraduate Research Award Scholar
"Pin Reinforced Light Weight Sandwich Panels"
Professor Marc Zupan, Advisor

Kenneth D. Gibbs Jr. Biochemistry and Molecular Biology Poster #42
Undergraduate Research Award Scholar
"Dendritic Cells Acquire Functional Peptide-MHC Complexes from Dead Tumor Cells"
Professor Suzanne Ostrand-Rosenberg, Advisor

Christina M. Humphries Psychology Poster #2
"The Effect of Flavor-Calorie Associations on Long-Term Food Intake in Rats"
Professor Zoe S. Warwick, Advisor

Laura E. Jones Political Science/History Poster #7
"The Czech and Slovak Republics: Political and Economic Effects of EU Membership"

Professor Cynthia Hody, Advisor
Professor Kathryn Brown, Advisor

Linda A. Jones Psychology Poster #22
"The Effect of Public Versus Private Setting During Invasive Medical Procedures on the Distress of Children with Cancer"
Professor Lynnda M. Dahlquist, Advisor

Isaac A. Kinde Biological Sciences Poster #44
Undergraduate Research Award Scholar
"Antiviral Inhibition of the HIV-l Capsid Protein"
Professor Michael F. Summers, Advisor

Tyl L. McCray Chemistry Poster #5
Undergraduate Research Award Scholar
"Investigation of Epoxide Synthesis in Biphasic Reaction Conditions"
Professor Dale Whalen, Advisor

James G. Mcllhargey Physics Poster #17
Undergraduate Research Award Scholar
"Reflection and Transmission of Light within a Rotating Frame"
Professor Morton H. Rubin, Advisor

Poster Session II: 11 a.m. - 1 p.m.

Aaron S. Merki Political Science Poster #35
"Equality and Standards Based Education"
Professor Geoffrey Vaughan, Advisor

Seth M. Miller Biological Sciences Poster #32
Undergraduate Research Award Scholar
"Development, Progression and Lethality of Spontaneous Mammary Carcinoma is Delayed in STAT6-Deficient NeuT Transgenic Mice"
Professor Suzanne Ostrand-Rosenberg, Advisor

Caitlin T. Reavey Biological Sciences Poster #10
"A System for Genetic Analysis of Rhodopsin in Yeast"
Professor Philip Farabaugh, Advisor
Professor Phyllis Robinson, Advisor

Ashina D. Singh Biochemistry and Molecular Biology Poster #19
Undergraduate Research Award Scholar
"Structural Studies of the Major Histocompatibility Complex Class II Transactivator (CIITA)"
Professor Colin Garvie, Advisor

Hieu Truong American Studies Poster #16
"The Legacies of the 1968 Washington Riots in the Shaw Neighborhood"

Professor W. Edward Orser, Advisor

Olusegun Williams Biochemistry and Molecular Biology Poster #14
Undergraduate Research Award Scholar
"Initial Stages of Amyloid-!3 Aggregation Revealed by Electron Paramagnetic Resonance Spectroscopy"
Professor Veronika A. Szalai, Advisor

T. Andrew Windsor Interdisciplinary Studies Poster #40
Undergraduate Research Award Scholar
"The Effect of Reward and Motivation on Cognitive Processes, as Modeled by the Paced Auditory Serial Addition Task (PASAT)"
Professor Julie B. Schweitzer, Advisor

Jun Xu Biological Sciences Poster #28
"Molecular Evolution of Cytoskeletal Proteins: The Plateins of Euplotid Ciliates"
Professor John A. Kloetzel, Advisor

Artistic Exhibits'
Exhibits on Display Continuously
The Fine Arts Building, Hallway Gallery, first floor

Nicole E. Ball Fine Arts/Photography
Undergraduate Research Award Scholar
"Desire"
Professor Lynn Cazabon, Advisor

Phuong Pham American Studies/Art
"Stitched and Stripped: Mixed Media Prints on the Construction of Feminine Culture"
Professor Diyan Achjadi, Advisor

Arthur Soontornsaratool Visual Arts
Undergraduate Research Award Scholar
"Bigger is Better: A Visual Examination of Male Body Image"
Professor Calla E. Thompson, Advisor

Directions to Fine Arts Exhibits
From the library, walk around the pond to your right and take the path up the hill. Enter the Fine Arts Building through the side door and turn left to the Hallway Gallery. OR, enter the first floor of Fine Arts from the side facing Engineering and turn right, through two doors to the Hallway Gallery.

The Commons, second floor
Hadi P. Gharabaghi Visual Arts
Undergraduate Research Award Scholar
'"Where is My Friend's House?' Postmodernism, Immigration, and Iranian Identity"
Professor Preminda Jacob, Advisor

Please join us at 1 p.m. in Room 767 for a special program featuring faculty speakers Professor Zoe S. Warwick, Department of Psychology and Professor Christel N. Temple, Department of Africana Studies Recipients of the 2005-2006 Undergraduate Research Awards and their faculty advisors will be introduced. A reception with refreshments will follow.

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EVALUATING INSTRUCTIONAL TECHNIQUES TO FACILITATE LEARNING JAVA PROGRAMMING

Rachel A. Abarbanel
Henry H. Emurian, Associate Professor, Department of Information Systems

This research studied the effects of peer inter-teaching, combined with a Web-based Java tutorial and traditional lecture, on students' Java programming skills. A class of 23 undergraduate students, ranging in age from 19 to 40 years, participated. The students were given a questionnaire three times throughout the 2.5 hours/week 14-week course. The questionnaire included questions about Java symbols and principles. The first questionnaire was given during the first class before any instruction had taken place. Students then completed the individualized Web-based Java tutorial. During the next class, students were paired for a peer inter-teaching dialogue and were then given the questionnaire a second time. A traditional lecture followed. During the third class, students were again given the questionnaire, and this time it counted as a graded quiz. The data, which consisted of objective test performance and software self-efficacy ratings, were evaluated over the three sessions. The data showed the effects that the Web based tutorial and peer inter-teaching had on the students' Java skills and also how the traditional lecture combined with the students' studying on their own affected their skills even further. Results from this research will aid in designing Java programming courses in order to ensure that students will be successful.

THE CASE OF YASER HAMDI: EVALUATING THE LEGAL STATUS OF U.S. CITIZENS HELD AS ENEMY COMBATANTS

Benjamin S. Alpert
Carol Barner-Barry, Professor, Department of Political Science

This research project examines the legal rights of United States citizens who may be detained, without formal charge or trial, for indefinite periods of time by the Executive during the ongoing war on terrorism. These legal rights are investigated through a case study of Yaser Hamdi, an American born enemy combatant, who was captured by U.S. troops operating in Afghanistan in 2001. Mr. Hamdi, a U.S. citizen, was not offered an opportunity to challenge his detention or meet with legal counsel. An analysis of the documentary record of his Supreme Court case, Yaser Hamdi v. Donald Rumsfeld, provides the legal arguments, both for and against the military detention of United States citizens who are designated enemy combatants and captured in foreign zones of military combat. The facts of Hamdi's life and documents providing evidence regarding his detention are reviewed. The executive orders following the terrorist attacks of September 11, 2001 and the congressional resolutions authorizing funds and military action in Afghanistan provide the basis for the Government's justification of the detention of Mr. Hamdi. The applicability to his situation of the constitutional rights of habeas corpus and due process are considered through a review of the briefs submitted to the Supreme Court prior to its decision in this case. Examination of the legal arguments for and against Mr. Hamdi's detention, as well as the Supreme COUli's final opinion, help define the extent and limitations on Executive power when it is dealing with American citizens

HAMPSHIRE AND VERMONT, 1976-2000

Patrick J. Arnold
John W. Jeffries, Professor, Department of History

What limited research is available about the political cultures of New Hampshire and Vermont reinforces the stereotype of these states as ideological antitheses. Pundits agree that New Hampshirites would probably never elect self-proclaimed socialist Bernie Sanders to Congress; nor would Vermonters elect the very conservative Judd Gregg to the Senate. Despite differences in each state's political culture, preliminary research suggests that during the period between 1960 and 1980, the states shared remarkably similar voting patterns. During the 1980s, New Hampshire became distinguishably more conservative and Vermont became more liberal and Democratic. However, the past decade seems to have witnessed a shift toward convergence in the states' voting patterns- a trend that continues through the present. As the study of a community's political culture is essential to one's comprehension of the nature of politics and government, a historical analysis of New Hampshire and Vermont politics and electoral behaviors, utilizing quantitative and qualitative methods of research, can offer insight into how the electorates of these New England states have developed over recent decades.

DESIRE

Nicole E. Ball
Lynn Cazabon, Assistant Professor, Department of Visual Arts

A series of photographic portraits was created that compares the material desires of adolescents and their parents. In examining the history of photography, for example the portraits by Diane Arbus or August Sander, I found myself wanting to stretch the boundaries of the traditional portrait. To do this, I present an individual via a photographic image that captures their desire alongside a fairly straightforward photograph of that person. Brief interviews were conducted with both parent and child during which I asked the participants to tell me about one thing that they most desire at this point in time, which money can buy. A portrait was taken, and later, based upon what was revealed in the interview, I produced a second photograph that represents their desire. I use these two images placed next to each other in order to create a more revealing portrait. The diptych-portraits created in the adolescent and parent groups have an obvious natural relationship. This will provide a comparison of the material desires of family members across one generation.

PREDICTING FRUIT AND VEGETABLE CONSUMPTION IN A RESIDENT COLLEGE POPULATION

Maurisa P. Blackmail
Carlo DiClemente, Professor and Chair, Department of Psychology

Previous research has established that fruits and vegetables are important for improving health and as a result should be included as part of a healthful diet. While current research has focused on improving adolescent consumption, few studies have examined increasing fruit and vegetable consumption in college. This study will examine predictors of consuming a diet high in fruits and vegetables in a resident college population. Participants consisted of 60 University of Maryland, Baltimore County freshman and

sophomore students living on campus. An anonymous 62-item questionnaire measured the dependent variable and the predictive factors. The dependent variable, fruit and vegetable consumption, was assessed by a standard seven-item food frequency questionnaire. Predictive factors assessed include perceived stress, knowledge of recommended daily servings, perceived benefits, and habit of eating fruits and vegetables since childhood. Other variables like Body Mass Index (BMI), gender, and self-efficacy were included in the analysis to identify any predictive significance. A stepwise multiple regression analysis was used to evaluate predictors. Overall consumption of fruits and vegetables in the college sample was very low (less than three servings per day).

CHARACTERIZATION OF HUMAN CONE SPECIFIC ARRESTIN BINDING IN THE DEACTIVATION OF PHOTOTRANSDUCTION.

Melissa P. Blackman, Maria Ascafio
Phyllis Robinson. Associate Professor, Department of Biological Sciences

The quenching of the G-protein coupled receptor activity, after its activation by light in vertebrate vision, occurs in two steps, phosphorylation by a protein kinase followed by the binding of a member of a family of proteins called arrestins. The process of phototransduction and its deactivation has been well studied in rods, which are involved in dim light vision. The process in cones, which are involved in high acuity color vision, has been less well studied. Many of the proteins of the pathway known to be involved in rods have been found in cones. One such protein is a cone specific arrestin. My research focuses on characterizing the binding of cone specific arrestin to cone opsins. Cloned human x-arrestin gene was first ligated into a vector with a methanol induced promoter that was then used to transform DH5a bacterial cells. Future experiments will involve the transfer of the human x-arrestin gene into a yeast expression system for methanol induced expression of the cone specific arrestin protein that will be used in in vitro binding assays.
(NSF, UNCF.MERCK)

IDENTITY MATTERS: CONTEMPORARY MEXICAN ART IN THE U.S. AND MEXICO.

Cindy R. Claros
Preminda Jacob, Associate Professor, Department of Visual Arts

In this project I investigate the role of context, specifically location and audience, as a significant factor influencing the artwork and cultural identity of contemporary Mexican visual artists. Are there significant differences in the artwork by artists of Mexican ethnicity residing in Mexico and in the United States? Certainly, in the art world it is becoming more difficult to grasp clear distinctions between cultural territories as borders are eroded by the growing phenomenon of globalism prompted, in large part, by information accessibility via the internet and other electronic media. I examine the complexity of Mexican identity in contemporary society by analyzing the artwork and concerns of four Mexican artists, whose roots and permanent residence are in Mexico; and four Mexican-American artists, who reside in the United States. My observations are based on both a series of interviews that I conducted with artists in Mexico in July 2004, as well as by recent scholarship on Mexican-American art in the United States. Initial research indicates a disconnection. The works of Mexican artists appear to be breaking away from traditional Mexican subject matter while works by Mexican-American artists

demonstrate a return to traditional symbolism in conveying Mexican ethnicity and nationalism. This research will shed further insight on Mexican artists, their artworks, and their relation to Mexican-Americans residing in the United States.

SAFE AT HOME: THE EFFECTS OF PEARL HARBOR AND SEPTEMBER 11TH ON SURVEILLANCE POLICY IN AMERICA

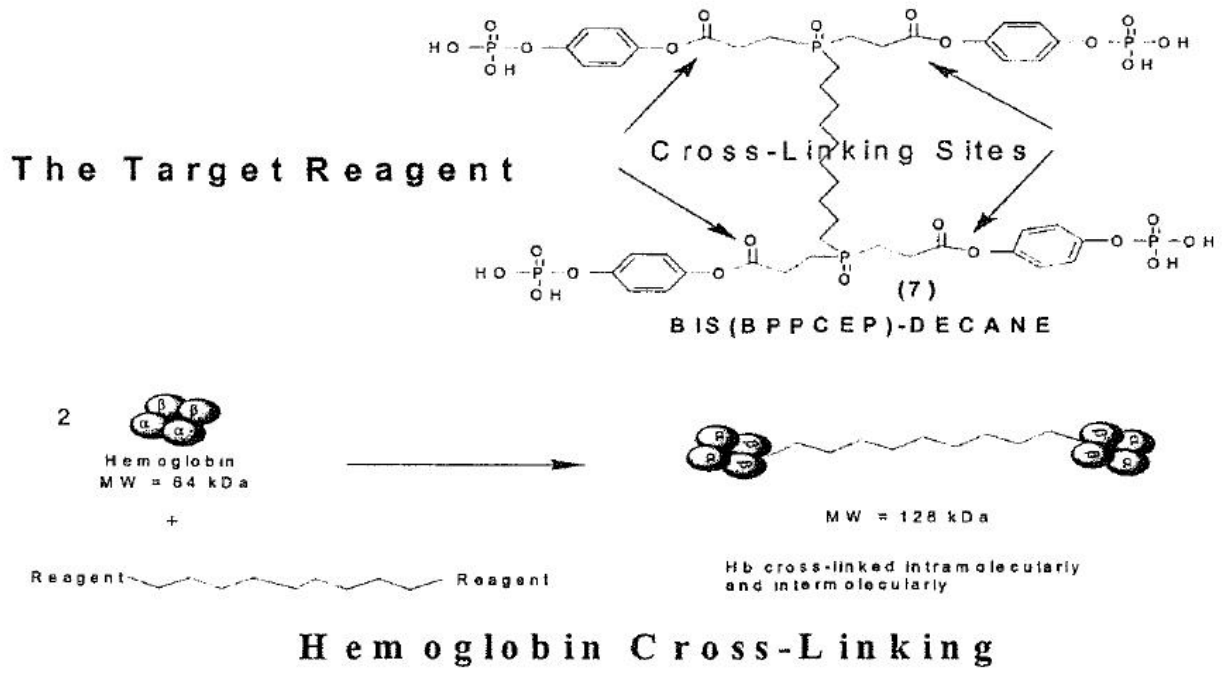
Robert W. Crow
Carol Barner-Barry, Professor, Political Science

This project discusses the surveillance policy repercussions of major foreign attacks on domestic American targets by means of the analysis of subsequent, relevant laws, executive policies, and court cases. This analysis indicates that when such types of attacks occur, the government is more likely to decrease the limits on domestic surveillance because of a heightened concern over national security. The case studies used in the analysis are the attack on Pearl Harbor and the attacks on September 11th. A careful study of these two incidents indicates a national threat management tendency to prioritize national security over privacy. Specific indicators of the priority of national security are Executive Order 9066, the order that allowed for the internment of Japanese Americans after Pearl Harbor, and the USA PATRIOT ACT, the law that allows greater use of wiretapping and other invasive techniques, after September 11th 2001. The sources used for this analysis include newspaper articles, scholarly articles, historical accounts, and the primary documents themselves. By studying the way in which two presidential administrations dealt with these defining moments in American history, we can understand better how governments tend to meet this type of challenge and be able to anticipate future governmental reactions to comparable events.

ARTIFICIAL BLOOD BASED ON CELL-FREE HEMOGLOBIN

Margaret Dabek
Ramachandra S. Hosmane, Professor, Department of Chemistry

The search for a safe and effective alternative to whole blood or packed red blood cells (RBC) has long been the focus of the biomedical and chemical communities. Hemoglobin is the oxygen-carrying protein found within RBCs, and almost all blood substitutes in current clinical trials are based on cell-free hemoglobin's that have been appropriately modified by organic cross-linking reagents so that the hemoglobin's can function outside the RBCs. Without proper modification, the cell-free hemoglobin's will not stay in circulation for more than a couple of hours and they do not deliver enough oxygen to the tissues. Even after modifications, the RBC substitutes suffer from a few other lingering problems. One of the major problems facing the current blood substitute industry is the facile filtration of modified hemoglobin's through endothelial lining and subsequent reaction with the vasorelaxing nihic oxide (NO), resulting in elevated blood pressure. The goal of my project is to prevent this undesired filtration by increasing the size of modified hemoglobin via oligomerization. To this end, we have come up with a novel approach which involves the synthesis of a polyfunctional organic reagent, called Bis(BPPCEP)Decane, which would simultaneously modify and dimerize the hemoglobin, as shown below. The current status of research on organic synthesis of this reagent, along with hemoglobin cross-linking studies using the reagent will be presented.



BEYOND THE SENSATIONALIST STORY: ANALYZING THE WORKS OF GERMAINE TAILLEFERRE

Shayla H. Donmoyer
Linda J. Dusman, Professor and Chair, Department of Music

Germaine Tailleferre was a French composer who was the only female member of an influential composers' ensemble called Les Six. She was born in 1892 and died in 1982. Throughout her entire life she was involved in composition, from her involvement at the Paris Conservatoire to her multiple revisions of her Concerto for Harp. Musicologists have portrayed Tailleferre as an introvert who had several failed marriages and choose to focus on her marital problems, thus ignoring her compositions or dismissing them as in consequential. Her compositions are anything but inconsequential and deserve recognition for their own merit. This paper demonstrates the current need to modifY the approach to women's compositions by specifically looking at the works of Germaine Tailleferre and the resources currently available in researching her and her works. The paper begins with a close reading of the chapter on Tailleferre in The Musical Woman: an International Perspective (1984) by Laura Mitgang, the only chapter available for an in depth perspective on Gennaine Tailleferre and her works. Developing a model for analysis based on the methods proposed by musicologists Renee Cox and Marianne Kielian-Gilbert, I provide an analysis of two pieces by Germaine Tailleferre, Deux Valses for piano and FOl'lane for flute and piano. This analysis demonstrates by example the need for deeper analysis and study of the actual works by female composers rather than relying solely on sensational biography to evaluate their work.

EXPLORING SOCIAL ISSUES THROUGH MUSIC: AN ALBUM

James E. Dorsey IV
William Kemp, Professor, Department of Music

In order to make the album relevant to a broad audience, I began by observing U.S. popular culture. I searched for common social themes by analyzing popular music, movies, and news. In addition, I watched documentaries that explored the prevalence of mental health issues (depression, low self-worth, etc.) in society. I recorded my observations and reactions about popular culture in my private journal. I discovered that a widespread social issue in the U.S. is poor mental health; people are hindered from being functional and satisfied as they grow older because of poor self-esteem and dysfunctional relationships. Using my journal entries, I crafted lyrics that explore how discovering self-worth, recognizing stereotypes, and overcoming societal standards can positively affect people's relationships. I intentionally wrote up-tempo music to allow the serious lyrical content to be absorbed easily. In order to help listeners remember and recall the lyrics, I used simple and catchy melodies. The result is a compilation of songs I composed, performed, and produced. I hope listeners will enjoy the dance quality of the music while concurrently evaluating how they regard themselves and interact with others. I have learned that having self-love and love for others is the key to healthy living.

IMPLEMENTATION OF A CUTTING PLANE ALGORITHM FOR DC OPTIMIZATION

Steven E. Ellis
Madhu Nayakkankuppam, Assistant Professor, Department of Mathematics

A MATLAB based software package was developed to implement an algorithm to optimize DC functions. Many problems in areas such as engineering, bioinformatics, economics etc. can be decomposed into DC programming problems. As such, the ability to locate the global optimum for functions of this class has relevance in numerous fields of study. Specifically, use of the software to study phylogenetic inference promises to provide new methodologies for estimating the maximum likelihood of evolutionary trees. Unfortunately, there are no readily available software packages of this type currently in public domain. Upon completion, this package will be released for free use. The implemented algorithm employs a sequence of linear approximations of the objective function to estimate the optimal value to within a user specified degree of accuracy. It was tested using DC functions whose solutions are well known, and the results were compared with other published iterative methods for validation. In every case, the package reached the desired level of accuracy in fewer iterations than current methods.

A NEW APPROACH TO OPERA: DISCOVERING HANDEL'S GEMS

Christie M. Finn, vocal, ***Stefanie Watson***, harpsichord
David Smith, Lecturer, Department of Music

I conducted my research on opera and the classical voice last summer at the International Institute of Vocal Arts in Chiari, Italy. Opera, an art form that arguably displays emotions at their rawest, is an archaic genre, finding its earliest roots in the ancient Greek dramas, but not finding a real niche in the Western music scene until almost the mid-Baroque period. One of the most famous and well-loved

composers of the Baroque period is George Frederic Handel, appearing on the opera scene around 1705. A German composer writing Italian operas in London, Handel's numerous operas were rarely performed until the twentieth century, when the expressive power of his music was rediscovered. Handel's arias are perfect for the undergraduate developing vocal technique because his arias call for a very pure tone and a high position of the voice, essential for an opera singer. I researched and studied a variety of Handel operas in order to help me begin establishing a firm vocal technique.

"V'adoro pupille"
from the opera Giulio Cesare in Egitto
V'adoro, pupille, sahette d'amore,'
Ie vostre javille son grate nel sen.
Pietose vi brama il mesto mio core,
ch ' ogn 'ora vi chiama I' amato suo ben.
"Let the Bright Seraphim"
aria from the oratorio Samson

Let the bright seraphim in burning row
their loud, uplifted angel trumpets blow.
Let the Cherubic host, in tuneful choirs
touch their immortal harps with golden wires.
I love you, eyes, darts of love
your sparks are welcome in my breast.
My sad heart, which calls to you its dearly
beloved in every hour, longs for you to be
compassionate.

PIN REINFORCED LIGHTWEIGHT SANDWICH PANELS

Corey A. Fleischer
Marc Zupan, Assistant Professor, Department of Mechanical Engineering

Optimizing lightweight structures is a continuous challenge for improving high performance in marine or airframe structural components. Sandwich beams consisting of strong face sheets and a low density core have gained application as weight efficient structures subjected to bending loads. New fabrication technologies now allow for hybrid sandwich structures known as X-core to be manufactured. X-core panels consist of carbon fiber face sheets separated by a closed cell polymer foam core reinforced with carbon fiber or metallic pins. The pins are inserted into the light weight foam core in the out-of-plane direction and extend from face sheet to face sheet. The effect of core thickness, pin material and polymer foam reinforcement on the out-of-plane axial compression response of these panel will be presented. The three point simply supported bending behavior of these reinforced panels is used to evaluate performance characteristics. Experimental observations are used to develop analytical models and validate failure mode maps which describe panel collapse load as a function of geometry. These models enable minimum weight optimization of the Xcore sandwich structures for specific applications. The mechanical response of these sandwich panels will be compared to that of competing panels.

MODELING UNCERTAINTY IN OPTICAL COMMUNICATION SYSTEMS

Lawrellce Akebe Fomulldam
John Zweck, Assistant Professor, Department Of Mathematics

Data, such as audio or video stream, is typically transmitted over long distances through optical fiber as an electromagnetic wave. When an electromagnetic wave propagates through optical fiber it loses its integrity because the fiber attenuates the signal. Because optical fiber communication systems are extremely long, covering distances from Baltimore to Seattle, it is difficult to study them. Researchers use a simple experimental model to study optical communication systems. In the model, a shorter loop is traversed several times to achieve the same distance. There is a device called a polarization scrambler within the loop that makes it behave like a straight-line system. The polarization scrambler rotates the polarization state of light. For an ideal polarization scrambler, the probability density function of these rotations is uniformly distributed. However, this is not true for a real polarization scrambler. Its distribution function is not precisely known. In an attempt to develop a mathematical model of the system, I am using non-uniformly distributed rotation models in order to capture the true behavior of the polarization scrambler and the system. I will describe the degree to which the behavior of the system depends on the choice of the probability density function of the rotations.

"WHERE IS MY FRIEND'S HOUSE?" POSTMODERNISM, IMMIGRATION, AND IRANIAN IDENTITY

Hadi P. Gharabaghi
Preminda Jacob, Assistant Professor, Department of Visual Arts

This project resonates with my experience as a refugee. I left Iran in 1994 at age 26 with little to no possessions. I lived in Pakistan for three years and thereafter came to reside in the U.S. My perception of the world is deeply influenced by my multicultural experience: I am the familiar stranger. Through the medium of the photo-essay I have sought to investigate my artistic and cultural roots in the context of other Iranian artists with whom I share interest, experience and understanding. Like myself, these artists explore issues of in-betweenness and nostalgia in their art. Heddy Shafie left Iran at age eight and has resided in the U.S. since. Her installations and video projects encompass a postmodern sense of identity viewed through subtle symbolic references to language and the flag. Soheyla Vafai left Iran at age 24 after her academic studies in art were interrupted by the events that led to the Islamic revolution in Iran in 1979. This resulted in a total reevaluation of her artistic style. "It was as if my eyes were suddenly opened, as if they were closed up to that point in my life," she states. Simin Vafai left Iran at age 37 after the Islamic revolution. Simin's interest in photography developed when she found herself unable to sing due to surgery on her vocal cords. This disaster accompanied a series of family problems. In photography Simin discovered a medium to portray her pain and the poetry of human struggle. I interviewed each of the participants individually as I became engaged in their art work. During this process I made portrait photographs of the artists. I shot the photographs with a large format view camera and then scanned the images to allow manipulations such as superimposing excerpts from the interviews. The image files were printed in letter-size, copied to 4" x 5"color negatives, and used to print enlargements of 30" x 40". These prints were then joined in groups of four to form each portrait. "Where is my Friend's House?" refers to the title ofa poem by Sohrab Sepehri, who is among the most cherished modern poets of contemporary Iranian literature. The internationally known Iranian filmmaker, Abbas Kiarostami, has made a movie with the same title in honor of the poet.

DENDRITIC CELLS ACQUIRE FUNCTIONAL PEPTIDE-MHC COMPLEXES FROM DEAD TUMOR CELLS

Kenneth D. Gibbs Jr., Brian P. Dolan
Suzanne Ostrand-Rosenberg, Professor, Department of Biological Sciences

Stimulation of tumor-specific CD4+ T lymphocytes may facilitate immune rejection of established primary tumors and control metastatic disease. Previously, tumor cell-based vaccines were generated by genetically modifying wild type tumor cells to express syngeneic MHC class II proteins and costimulatory molecules. Such vaccine cells were hypothesized to be antigen presenting cells (APC) to CD4+ T cells in vivo, and to enhance immunity by activating CD4+ T cells to novel tumor-encoded MHC class II-restricted epitopes. Using genetically marked tumor cells and dendritic cells (DC), we now demonstrate that MHC-antigen complexes are transferred from dead, but not live, tumor cells to DC. Both MHC class I and MHC class II complexes are transferred, and the transferred complexes are stably expressed on the DC cell surface for several days, during which time DC undergo maturation. The transfer is receptor-mediated and requires direct contact between dead tumor cells and DC displaying transferred MHC complexes activate T cells to tumor-encoded epitopes restricted by the MHC genotype of the tumor cell, regardless of the MHC genotype of the DC. MHC complex transfer from tumor to DC may be a novel method by which DC capture and present antigen.
(NIH CA52527, NIH CA84232, DAMD-17-0l-1-0312, DAMD-17-03-l-0334, NIH GM08663)

RECOMBINANT MEMBRANE-BOUND RECEPTORS AS NOVEL BIOSENSORS

Thomas Hsu
Leah Tolosa, Research Assistant Professor, Department of Chemical and Biochemical Engineering

The genes mglA, mglB and mglC comprise the beta-methyl galactosidase transport system in Escherichia coli. This group of proteins is a member of the ATP-binding Cassette (ABC) Superfamily of transporters. The mglB gene encodes for the soluble glucose-galactose binding protein, mglC for the integral membrane component and mglA for the ATP-binding component. In this study, mglC and mglA were cloned into the pBAD TOPO® TA cloning vector, which allowed for the direct insertion of the genes from Taq-amplified PCR of the E. coli genome. This vector uses the araB AD promoter that is inducible by the addition of arabinose. A histidine tag at the C-terminal allows for ease of purification. Digestion with Ncol restriction enzyme resulted in three fragments of 791, 1053 and 7884 bp's when the genes are inserted in the right orientation. SDS-PAGE of the crude protein extract showed two bands of 56kD and 37kD, consistent with the MgIA and MglC proteins. The proteins were purified using TALON™ Purification Kit. Future direction: The proteins will be reconstituted in lipid membranes and tested as potential glucose sensors.

THE EFFECT OF FLA VOR-CALORIE ASSOCIATIONS ON LONG-TERM FOOD INTAKE IN RATS

Christina M. Humphries
Zoe S. Warwick, Associate Professor, Department of Psychology

Associations between a food's flavor and its caloric content influence short-term meal intake in rats; less is known about the effects on long-term intake. To address this question, a gelatinous chow diet was prepared in three different caloric densities, low (0.4 kcal/g), mid (0.8 kcal/g), and high (1.2 kcal/g). Three (Kool Aid) powders were used for flavoring. Three groups of rats were fed a cycle of high-, mid-, and low-density diet on consecutive days for 18 days. Group CONSISTENT received consistent pairings of each density with a unique flavor. Group INCONSISTENT received random and inconsistent pairings of density and flavor. For group ONEFLA VOR, all three densities were the same flavor. A between-group comparison of intake revealed that the average caloric intake by INCONSISTENT (mean 98.2, SE 3.0 kcal) and ONEFLAVOR (mean 104.2, SE 3.4 kcal) exceeded CONSISTENT (mean 85.6, SE 3.0 kcal). Because all animals received equal exposure to all diet densities, the higher intake by INCONSISTENT and ONEFLA VOR indicates that the absence of density-predictive flavor cues increases energy intake. This suggests that inconsistent relationships between flavor and caloric content-such as consumption of both low-calorie ("diet") and full-calorie versions of a food-may lead to increased overall intake in humans.

SHOULDN'T EVERY SPECIES HAVE ITS OWN DNA? EXPLORING DNA SHARING USING THE WHITE GOOSE COMPLEX

Elizabeth M. Humphries, Jeffrey L. Peters
Kevin E. Omland, Assistant Professor, Department of Biological Sciences

One common expectation in evolutionary biology is that every species has its own unique DNA. However, in many cases this is not true. The White Goose Complex of North America is a classic example of this phenomenon. This complex consists of three taxa: the Ross's Goose, the Lesser Snow Goose and the Greater Snow Goose. Previous genetic studies of this complex have shown two highly divergent DNA lineages present in all three taxa. Two hypotheses have been proposed to account for this lineage sharing--ancestral polymorphism and hybridization. We further examined these hypotheses by sequencing 618 base pairs of mitochondrial DNA of 10-40 individuals from each taxa. We also compared our sequences to previously published sequences from Lesser Snow Geese and Ross's Geese. Currently, both ancestral polymorphism and hybridization are possible explanations for the DNA sharing among the three taxa.
(Blackwater National Wildlife Refuge, Maryland Ornithological Society)

HISTORY, SOCIETY, AND CULTURE IN BALTIMORE-WASHINGTON MOSQUES

Sarah Husain
John Birkenmeier, Instructor, Department of History

This paper presents a first-hand case-study investigation of mosques and their communities in the Baltimore-Washington corridor. I completed my research though interviewing and surveying area mosque administrators, employees, volunteers, members, and attendees and non-attendees. Then, in

order to compare the American model of a Muslim community to a traditional Muslim society, I evaluated my findings against published materials about Cairo, Egypt. Additionally, I related my local findings to national research on American mosques and their communities. I found that American mosques play an extended societal role as compared to Cairene mosques because of the social and cultural support that the Muslim community can offer to area Muslims who are seeking it. While American mosques provide many of the same functions and services that Cairene mosques provide, American mosques reach beyond the religious sphere into other aspects of the community, such as full-time education, weddings, and a gymnasium. Additionally, Baltimore-Washington area mosques also are concerned with inter-faith relations, reflecting the diverse nature of the area's society. The differences between American and Cairene mosques can be attributed to differences in each overall society.

THE CZECH AND SLOVAK REPUBLICS: POLITICAL AND ECONOMIC EFFECTS OF EU MEMBERSHIP

Laura E. Jones
Cynthia Hody, Chair and Associate Professor, Department of Political Science
Kathryn Brown, Assistant Professor, Department of History

Of the ten states that joined the European Union on May 1, 2004, the Czech Republic can be considered one of the best fits for the Union, and the Slovak Republic the state which struggled most to reach the membership requirements. However, it is also likely that the Slovak Republic is now the country with the most to gain. The addition of countries which are substantially different than the older members is likely to change the traditional political and economic environments of the EU. This addition will also bring new social issues to light, especially employment and free movement for EU citizens, and have already increased awareness of the dismal living standards of the large Romani (Gypsy) populations in both countries, as well as other minority rights issues. It is also important to see how much integration with the European Union the countries will choose to accept, considering that both have been under influence from supra-national powers for over 100 years (Austro-Hungarian Empire, Soviet Union), and have had a brief period of freedom from these influences. This study will examine the economic and political effects occurring in both Republics related to EU membership, and in which sectors these effects are concentrated.

THE EFFECT OF PUBLIC VERSUS PRIVATE SETTING DURING INVASIVE MEDICAL PROCEDURES ON THE DISTRESS OF CIDLDREN WITH CANCER

Linda A. Jones
Lynnda M. Dahlquist, Professor, Department of Psychology

This study focused on a frequently overlooked social aspect of cancer treatment by comparing child distress during private and public treatment sessions in order to evaluate how the presence of unfamiliar individuals affects children during invasive medical procedures. Research suggests that children whose invasive medical procedures are conducted in a public treatment setting will demonstrate more distress than children whose treatment is conducted in a private setting, but this has yet to be empirically supported. Fifty-one subjects between ages 2 and 8 were videotaped during portacatheter procedures and coded for distress behaviors on the Observation Scale of Behavioral Distress (OSBD). From these 51 subjects, 155 portacatheter sessions were categorized according to

treatment location and phase of procedure (anticipatory, procedural, post-procedural) and will be analyzed via univariate ANOVAs. Anticipated results regarding treatment environment will further benefit pediatric cancer research by providing guidelines for preventing unnecessary anxiety and distress during invasive medical procedures.

SHORT FILM IN THE GENRE OF SUSPENSE

Jeffrey A. Jordan
Vincent Grabill, Associate Professor, Department of Visual Arts

Two short videos, in the genre of suspense, were produced and screened for critique, and viewer feedback was collected for evaluation and application of their successes and failures to the development and production of a new short film in the suspense genre. The short videos, comprised of a two-and-a-half-minute narrative and a 40 second experimental piece, employed the suspense conventions of viewer presentiment and anticipation, impending danger, and surprise. Viewer reactions were analyzed to distinguish which conventions worked and did not work in the short subject format, and to determine how the conventions worked differently than when used in feature-length works. The visual and aural content of the short videos was also studied to discern how it combined with narrative elements to make the suspense conventions more effective. The results of this study serve not only to make a more successful short film, but will also benefit efforts to adapt the suspense genre, found most often in feature-length films, to shorter format works, where its presence is currently less pronounced.

BROWN V. BOARD OF EDUCATION: WAS IT ENOUGH?

Kathleen B. Kaluhiokalani
Carol Bamer-Barry, Professor, Department of Political Science

The decision by the Supreme Court in Brown v. Board of Education ended years of legal educational segregation in the United States. However, the Supreme Court left enforcement up to the District Courts with a vague guideline that school districts desegregate "with all deliberate speed". Immediately it became evident that numerous areas of the country would violate the Supreme Court decision and the District Courts would be slow to respond. As a result, many school systems privatized while others shut down altogether. Still some school districts offered freedom of choice programs that operated segregated schools under the premise of choice. Those school districts that did begin the process of integration found white residents were resistant to the concept of African American children attending school alongside white students. This led to a suburban "white flight" that transformed all white suburbs and school districts into predominantly African American suburbs and school districts. The study of Prince Georges County in Maryland is an example of how the fight to integrate their school district met with massive resistance and extensive "white flight". Ultimately, the school district never became fully integrated and instead went from predominantly white to predominantly African American over a twenty year time frame from 1960 to 1980.

ANTIVIRAL INHIBITION OF THE HIV-l CAPSID PROTEIN

Isaac A. Kinde, Chun Tang, Erin M. Loeliger, Sampson Kyere, Keith Mayo, Eric Barklis, Yongnian Sun, and Mingjun Huang
Michael F. Summers, Professor, Department of Chemistry and Biochemistry

Human immunodeficiency virus (HIV) is a major global threat and inhibition of this virus could save tens of millions of lives. It has been shown in previous experiments that, as the newly-formed virion matures, the capsid proteins condense into a conical core that encapsulates the virion's RNA. This process is essential for survival in all retroviruses, and therefore serves as a potential target for inhibiting the virion. Two compounds have been identified that bind to the N-terminal domain of the HIV -1 capsid protein. The first compound, N-(3-chloro-4-methylphenyl)-N' -{2-[({5-[(dimethylamino)-methyl]-2-furyl}methyl)-sulfanyl]ethyl}urea) (CAP-I), is non-toxic, and is shown to inhibit capsid assembly in vitro and virus infectivity in vivo. CAP-1 does not have an effect on viral entry, reverse transcription, integration, proteolytic processing or virus production; these findings suggest that CAP-1 is operating under a novel mechanism. The second compound, 1-(4-(N -methylacetamido)-phenyl)-3 -(4-methyl-3 -nitropheny l)urea) (CAP-2), has a higher affinity for binding to the capsid protein, showing more prominent inhibition of the capsid protein in vitro. This compound, however, is toxic to cells and in vivo data could not be collected. Current efforts include taking the less toxic, weak affinity CAP-1 compound as a lead and studying the effects of structural modifications on binding affinity and efficacy.
(Howard Hughes Medical Institute)

UNUSUAL OCCURRENCES: EFFECT OF HIV-l MATRIX MUTATIONS ON MYRISTATE EXPOSURE

Erin M. Loeliger, Paz J Luncsford, Melissa A. Liriano, Jamil S. Saad
Michael F. Summers, Professor, Department of Chemistry and Biochemistry

The myristylated matrix protein (myr-MA) of the human immunodeficiency virus type 1 (HIV -1) is a key player in the viral life cycle, targeting Gag, a main viral precursor polyprotein, to the plasma membrane during virus assembly, and then dissociating from the membrane during infection to assist in targeting the viral genome to the host cell nucleus. This membrane release was proposed by our lab to be controlled by an unexpected entropic equilibrium which mediates exposure of the myristyl group (an N-terminal fatty acid group) through coupling with trimerization. Research is now underway to determine the effect of point mutation(s) of MA on this entropic equilibrium in order to better understand this process on the molecular level. It was previously shown that such point mutations impair viral assembly in vivo. We believe that these MA mutants result in a drastic shift in the myristyl equilibrium, limiting myristyl exposure to the environment. Our NMR studies and analytical ultracentrifuge (AU) data showed that the myr-MA mutants, V7R and L8I, are undoubtedly monomers and showed no concentration-dependent behavior. In addition, multidimensional NMR spectra have been obtained for the L8I mutant and its tertiary structure is currently being determined. Our results shed further light on this crucial, but unusual mechanism of intercellular localization and should facilitate efforts to develop therapeutic strategies targeting the HIV -I myristyl switch.
(Howard Hughes Medical Institute)

A PRELIMINARY ANALYSIS OF FEATHER MICROBIAL COMMUNITIES ON NEW WORLD P ASSERINES

Anne C. Logie, Isabelle A. Bisson, Peter P. Marra, Patrick M Gillevet, Edward H. Burtt Jr.
Kevin E. Omland, Assistant Professor, Biological Sciences

Feather samples were collected from birds captured using mist-nets in Patuxent River Park, Maryland in May and June 2004. Breast, head, tail and dorsal feathers were extracted and examined for diversity and abundance of feather microbial communities. The 16s rRNA gene was PCR-amplified using a labeled forward primer and unlabeled reverse primer for subsequent Amplicon Length Heterogeneity (ALH, Suzuki et al. 1998) fingerprinting analyses. ALH fingerprinting was used to assay the diversity and abundance of feather microbial communities. Data collected suggested microbial communities present on individuals within a species did not vary significantly. Tail, head, breast, and dorsal feathers had similar microbial communities. Microbes with an amplicon length of 336.24 bp were most common and abundant but not present in redstarts. Microbial communities differed between redstarts and other bird species assayed. The results collected provide preliminary information that will further be examined on passerine wintering grounds. This could provide a way of identifying the migratory path taken by specific passerines during winter migration.
(Smithsonian Environmental Research Center)

ELIMINATING THE RUB: CHALLENGES AND SOLUTIONS FOR DESIGNING A COMMON AGRICULTURAL POLICY THAT COMPLEMENTS DEVELOPMENT POLICY IN THE EUROPEAN UNION

Gregory Lowe
Cynthia Body, Associate Professor and Chair, Department of Political Science

The Common Agricultural Policy of the European Union, commonly referred to as the CAP, is the mostly costly, and possibly the most controversial, supranational policy the EU currently executes. The CAP receives a barrage of criticisms, from free trade advocates to Euro-skeptics, but the most vigorous call for CAP reform is from developing countries and humanitarian organizations. The CAP routinely results in overproduction of agricultural products which simultaneously get dumped on both the European market and the markets of developing countries. Various reforms have been proposed and implemented, yet this phenomenon of overproduction continues. Meanwhile the EU provides billions of Euros in aid to developing countries, yet over the years, little progress has been made in improving economic conditions in these countries. This paper explores the challenges and solutions facing CAP reform, so as not to undermine EU development policy. Through a combination of case studies, historical institutionalism, and rational choice theory, I propose that fundamental shifts in the knowledge structure of the EU itself are necessary for reforms to be successful. The EU is an entrenched bureaucracy that has several institutions that address policy challenges in contradictory ways. Requiring the influence of epistemic communities and public pressure, the knowledge structure in the EU can be redistributed such that the CAP and development policy advocate collective interest over self-interest. Transparency, democracy, and a fundamental shift in rational decision making are necessary for this redistribution. Such reforms are an immense challenge that will require mounting pressure and difficult adjustments for agricultural constituencies, but will result in comparative advantages for both the EU and developing countries.

DETERMINING CAUSES OF GLOBAL LABOR TRAFFICKING: A PROCEDURAL DILEMMA

Erum F. Marfani
Cynthia A. Body, Associate Professor and Chair, Department of Political Science

Human trafficking, or trafficking in persons, is not a new phenomenon. The study of it, however, in today's global context is a new endeavor. The realm of labor trafficking includes forced non-sexual labor, slavery, and/or involuntary servitude. Scholars identify many sources of human trafficking, including poverty, inadequate education, societal values, demand for cheap labor, and migration policies. Because many of these causes and the rate of trafficking itself are difficult to measure quantitatively, a procedure had to be developed that would retain validity and quantitative capability overall, thus making this endeavor the first of its kind in the field of human trafficking. From the State Department's 2004 Trafficking in Persons Report, source countries, from where victims originate, for labor trafficking exclusively were identified. These countries were given a value of 1. All other countries in the world were given a value of O. Statistics from the United Nations and World Bank were collected on each of these countries (education index, gender empowerment measure, and gross national income per capita). Based on the binary nature of the trafficking variable and the number of cases, the logit model was determined to be the most rigorous.

IMMIGRATION THROUGH THE PORT OF BALTIMORE: 1868-1914

Laura Marshallsay
Michelle Scott, Assistant Professor, Department of History

The American immigrant experience is shaped by what motivates an immigrant to journey to the United States and by where that immigrant chooses to relocate. Equally essential to this experience is the geographic location that serves the point of entrance. New York Harbor's Ellis Island is entrenched in historical memory as the destination of Europe’s "huddled masses." What is less well known is the role of other cities in the story of American immigration. As the Eastern seaboard's second busiest immigration port after 1865 and connected to the rest of the growing nation by an extensive, established rail network, Baltimore attracted thousands of British and Northern European immigrants looking for a new life. The majority of these newcomers chose not to permanently settle in Baltimore but instead were lured west by affordable land and convenient connections to St. Louis and Chicago via the B&O Railroad. Understanding these immigrants – who came, why they came, how they came, and where they went - is an important part not only of Baltimore's history, but of the history of the Mid-West. Ultimately, the German immigrant experience in Baltimore serves as a unique foundation for the national German-American community experience.

RAPID IDENTIFICATION OF HIV DRUG-RESISTANT STRAINS BY ELECTRO SPRAY IONIZATION FOURIER TRANSFORM MASS SPECTROMETRY (ESI-FTMS)

Chad D. McCormick
Daniele Fabris, Assistant Professor, Department of Chemistry and Biochemistry

A novel approach is proposed for early detection of HIV and screening of possible drug-resistant strains, which involves PCR amplification of target genomic regions and identification of variants by electro spray ionization Fourier transform mass spectrometry (ESI-FTMS). Our strategy is based on the hypothesis that ESI-FTMS can differentiate very small mass differences in DNA samples larger than 25 kDa, when isotopically labeled dNTPs are incorporated in single stranded PCR products. Key targets were selected by performing BLAST searches for conserved regions in HIV -1 genomes of different known strains. Non-infectious DNA plasmids corresponding to these viral strains were obtained in competent cells from NIH. Amplification was performed using phosphorylated antisense primers and labeled dNTPs. Single-stranded isotopically enriched products were immediately analyzed by ESI-FTMS. Preliminary ESI-FTMS data suggests the base composition of each product can be immediately inferred, thanks to the high resolution and accuracy offered by this technique. Each unique base composition can be correlated to the known compositions of the template strains, thus leading to its unambiguous identification. Future work will involve testing the clinical potential for HIV detection and strain screening in patient's only days after infection, as opposed to months required by current antibody technologies.

INVESTIGATION OF EPOXIDE SYTHESIS IN BIPHASIC REACTION CONDITIONS

Tyi L. McCray
Dale Whalen, Professor, Department of Chemistry and Biochemistry

The primary goal of this research is to investigate the epoxidation of unsaturated compounds by mchloroperoxybenzoic acid (m-CPBA) in biphasic methylene chloride (CH2Cb)/ water (IM Na2C03) mixtures. Epoxidation is known to be stereospecific. This particular procedure is often used to synthesize epoxides that are highly reactive with acidic reagents. We have observed that the epoxidation of cisstilbene, however, is not stereospecific. To date, this investigation has revealed that reaction conditions consisting of low molar ratios of peroxyacid to cis-olefin yield almost exclusively cis-epoxide, while higher molar ratios of peroxyaic to cis-olefin yield almost exclusively trans-epoxide. For example, at a 0.6 molar ratio, fifteen times more cis-epoxide is produced that trans-epoxide. At a 2.0 molar ratio, twenty-one times more trans-epoxide is produced that cis-epoxide. The stability of the cis-epoxide under these reaction conditions is being investigated to ensure that it is not being isomerized after the epoxidation reaction occurs. We will further investigate this reaction in an effort to determine the mechanism.

REFLECTION AND TRANSMISSION OF LIGHT WITHIN A ROTATING FRAME

James G. McIlhargey
Morton H. Rubin, Professor, Department of Physics

The Global Positioning Satellite system works by transmitting the satellites position and measured time to users on Earth. Since the satellites are moving, the slowing of the satellite's clocks predicted by relativity, as well as the time delays as a result of Earth's rotation, must be accounted for. The classical effect of rotation, the Sagnac effect, is a time delay between light traveling around the Earth in the direction of rotation versus the light traveling against rotation. Because of this the speed of a light beam appears to depend on direction to observers on the earth. In order to study this effect, a group at UMBC led by Dr. Zhang and colleagues performed a rotating ring laser experiment. They measured the wavelength and frequency of light propagating clockwise and counterclockwise around the rotating ring laser. They observed standing waves arising from the waves traveling clockwise and counter-clockwise. These waves experienced different wavelength shifts, and frequency shifts. These shifts for standing waves have not been reported in the literature. The product of the wavelength and frequency equals the velocity of light, and in the experiment, it was found that in both clockwise and counterclockwise waves, the velocity of light was the universal constant c. This result is contrary to current belief that the different waves have different velocities. The purpose of this research is to use principles of relativity and the wave formulation of electromagnetism to describe the standing wave propagation of light within a rotating reference frame. This theory shows that the distance traveled for the two different waves will be different and observable, as well as the time it takes to traverse those paths. The theory developed will then be applied to the problem of standing wave propagation within a rotating optical fiber, an experiment currently under way.

EQUALITY AND STANDARDS BASED EDUCATION

Aaron S. Merki
Geoffrey Vaughan, Assistant Professor, Department of Political Science

Over the past two decades, schools have shifted their focus toward creating an educated workforce and away from creating a liberally educated public. Beginning with the "A Nation at Risk" report in 1983, educators saw a need to tie student achievement to standards. Children in the U.S. were less proficient than many children internationally in subjects such as reading, math and science where achievement can be measured quantitatively. The result of this was a testing revolution that emphasized those subjects. Meanwhile, art, music, civics and the humanities did not fit into the revolution. Therefore, one of two detrimental things happened in school districts. Either those subjects were tossed out the window, or they were faultily tied to modem educational models for standards and accountability. This trend continues today with initiatives such as No Child Left Behind. While well-intentioned, our standards and accountability approach has been detrimental to our children's education. We have made certain subjects the property of the elite by removing them from our public schools. We are creating a new American working-class that is separated from the aristocracy responsible for the governance of our nation. In a representative democracy, this inequality is unacceptable, and must be ameliorated.

INTERNATIONAL LAW: MORE THAN JUST A PAPER TIGER AMONG MAJOR POWERS?

Viktoriya Mikityanskaya
Jeffrey Davis, Assistant Professor, Department of Political Science

In contrast to municipal law, international law has a lack of enforcement power, which has led people to question its viability, especially in regard to major powers. This leads to an important question: When do major power states abide by international law and why? There have been vast amounts of studies conducted on the subject of international law; however, most look only at a particular country or a particular issue area. My research attempts to address a broader field, examining the actions of four major powers in two issue areas. Furthermore, the research endeavors to uncover why major powers abide by international laws in certain instances while disregarding it at other times. The four major powers that are examined are: China, France, the United Kingdom, and the United States. Each state's compliance with international law is analyzed in the realms of extradition of fugitives across international borders and state sovereignty. This research will also explore the soundness of the theory that major powers abide by international laws only when it is beneficial to their interests because there is very little if any enforcement of international law.

DEVELOPMENT, PROGRESSION, AND LETHALITY OF SPONTANEOUS MAMMARY CARCINOMA IS DELATED IN STAT6-DEFICIENT NeuT TRANSGENIC MICE

Seth M. Miller, Samudra K. Dissanayake
Suzanne Ostrand-Rosenberg, Professor, Department of Biological Sciences.

Deletion of the gene encoding the transcription factor Signal Transducer and Activator of Transcription 6 (STAT6) results in increased immunity and survival of mice inoculated with the 4TI mammary carcinoma, a highly malignant and spontaneously metastatic BALB/c-derived transplantable tumor. To determine if deletion of the ST AT6 gene also confers resistance to naturally occurring breast cancer, we have interbred BALB/c STAT6-deficient (STAT6-1 -) with BALB/c NeuT (NeuT+1 -) transgenic mice, which contain the activated ErbB-2 gene and spontaneously develop lethal mammary carcinoma. (STAT6-1 - x NeuT) FI mice were backcrossed to STAT6-1 - mice and the offspring screened by PCR to identify STAT6-I-NeuT+1 - individuals. Female NeuT+1 - and STAT6-I-NeuT+1 - mice were palpated weekly to compare 1) age at tumor onset, 2) size of tumors, 3) number of tumors per mouse, and 4) survival time of mice. Mice were monitored for up to 28 weeks. STAT6-I-NeuT+1 - mice showed a statistically significant increase in survival time relative to NeuT+1 - mice (27.9 vs. 23 weeks, respectively), and had fewer tumors per mouse, decreased tumor size, and statistically significant delayed tumor onset when compared with NeuT+1 - mice_ These results confirm that host STAT6-deficiency enhances tumor-specific immunity against spontaneous primary and metastatic breast cancer, and that the immunity is not directed against ST A T6 protein.
(NIH ROICA52521, ROICA84232, DOD DAMD-17-01-0312, and DAMD-17-01-0313, and MARC U*STAR grant T34 GM08663, NIH-IINIGMS Grant 08663-05)

BRIGHT, NARROWBAND, PORTABLE ENTANGLED PHOTON SOURCE AND DETECTION SYSTEM

Eric J. Montgomery
Yanhua Shih, Professor, Department of Physics

The Naval Research Laboratory (NRL) requested an entangled photon source to probe their "slow light" experiments. Operation at UMBC and NRL dictated portability. However, no known similar system existed worldwide, so new challenges were overcome. Where detection electronics used to fill a seven-foot rack, they were condensed to a single laptop and PCI card adapter. Where lasers and optics used to fill many square feet of optical bench space, they were condensed to just a few square inches. Results demonstrate that not only is the system compact-it is state-of-the-art. Quantum entanglement through polarization is observed. Detection electronics can distinguish between photons arriving 817 femtoseconds apart, leading to photodiode-limited resolution. Brightness, compared to equivalent single-pass entangled photon sources, is increased significantly through cavity-enhanced parametric down conversion. Bandwidth (range of output frequencies) is narrow, approaching widths of single atomic absorption resonances, and the operating frequency can be locked to an external laser reference. The completed system will benefit both UMBC and NRL, and will be used in exciting "slow light" experiments at NRL in summer 2005.

ROLE OF ZEBRAFISH N-CAHDERIN IN NEUROGENESIS

Nayan Patel
Rachel Brewster, Assistant Professor, Department of Biological Sciences

The aim of this work is to get more insight into the development of the central nervous system (CNS) by using the zebrafish as a model system. The regulation of neuronal differentiation, or neurogenesis, is necessary for cell diversity in the CNS. Recent observations suggest that N-Cadherin (N-Cad), a calcium dependent cell adhesion molecule that functions as the transmembrane component of adherens junctions (AJs), may regulate neurogenesis. Understanding how N-Cad functions may provide insights on the mechanisms of neurogenesis.

I hypothesize that N-Cad interacts with beta-catenin, a downstream component of the Wnt signaling pathway, to regulate neurogenesis. It is known that beta-catenin associates with cadherin as an essential component of AJs and that it also serves as a transcription factor. One of the targets of beta-catenin is neurogenin, a regulator of neurogenesis. One hypothesis is that N-Cad may prevent beta-catenin from activating neurogen in, by sequestering the latter at the cell membrane (AJs). However, loss of N-Cad may cause an increase in the levels of nuclear beta-catenin and hence neurogenin transcription.

This can be demonstrated by collecting embryos and sectioning them. The sections can be labeled for beta-catenin using antibodies, and the sections can be viewed through a confocal microscope. Through the microscopy, the distribution of beta-catenin can be viewed and analyzed.

WHAT'S WAX GOT TO DO WITH IT? AUTHENTICITY AND REPRESENTATION AT THE GREAT BLACKS IN WAX MUSEUM

Faith P. Perfecto
Patrice McDermott, Associate Professor and Chair, Department of American Studies

When one hears the term 'wax museum' oftentimes Madame Tussaud's collection comes to mind. The association is understandable, considering past meanings and uses of wax figures have been centered on entertainment. However, the Great Blacks in Wax Museum in Baltimore simultaneously challenges and embraces this conventional cultural association in the curator's attempt to educate and instill pride in African American heritage. This study examines the unique ways in which African American history is constructed for visitors to the museum through its use of representational wax figures. This project also explores the shifting position of wax within the spectrum of "ethnographic-aesthetic" content in conventional museums and analyzes how the attributes of the physical re-creations of historical characters embody a powerful but perhaps problematic sense of authenticity in the museum's telling of public history.

STITCHED AND STRIPPED: MIXED MEDIA PRINTS ON THE CONSTRUCTION OF FEMININE CULTURE

Phuong X. Pham
Diyan Achjadi, Assistant Professor, Department of Visual Arts

As embroidery acts as a vehicle for pleasure and domestic power for women; it is also inseparable from a woman's supposed powerlessness, in terms of her roles and duties as a homemaker. Portrayals of female sexuality in popular adult media demonstrate this paradox as well, displaying women in pursuit of their own sexual freedom while rendering them passive objects meant to please their viewers. My prints act as a dialogue between a classic, domestic, and nearly asexual definition of femininity and an exaggerated ideal of the female form. These works explore meticulous hand-crafts along with the multiplicity inherent in print culture, investigating how a delicate and gendered craft can alter or shift the meaning of gendered images found in exploitative popular media. Using digital and print manipulation to alter these images, I plan to subvert the intended meanings of them to make layered compositions. Combining distorted layers of women from popular adult media as well as embroidery and what is typically considered women's craft, I aim to negotiate these opposing ends of the spectrum that categorize and assign definitions to what it means to actually be feminine.

FMETACOST: CALCULATING THE COST OF MISCLASSIFICATION IN MACHINE LEARNING BASED ON THE FEATURES OF AN INSTANCE

Natalie C. Podrazik
Marie desJardins, Assistant Professor, Department of Computer Science

The problem of classification, or assigning data items into labeled classes, is a key area in machine learning research. Cost sensitive classification takes into account the varying cost of errors. The most common type of cost-sensitive learning uses a cost matrix, which assigns a penalty to each type of classification error. For example, an item that actually belongs to class A, but is assigned to class B incurs

a cost CAB, as stored in the cost matrix. One of the most important cost-sensitive classifier is Domingos' MetaCost, which uses cost matrices to learn a classifier that minimizes the total expected cost of errors in a data set. 1 However, in many domains the cost of errors is based on the attribute(s) that characterize data items. For example, predicting the credit risk associated with a large loan incorrectly incurs a greater cost than misclassifying a small loan. This project extends the focus of misclassification research from assigning the predicted and actual class labels to using a feature-based cost function within the classifier. This makes the misclassification depend on an instance's features. We compare the performance of this new classifier, FMetaCost, to that of C4.5R, oversampling, undersampling, and MetaCost itself. Future work will lead to the improvement of a feature-based evaluator, thus decreasing the cost of misclassification in machine learning. I Domingos, P. (1999). MetaCost: A General Method for Making Classifiers Cost-Sensitive. In Proceedings of the Fifth ACM SIGKDD International Conference on Knowledge Discovery and Data Mining. Pp. 155-164.

CONSTRUCTIONS OF MASCULINITY IN VIETNAM WAR FILMS

Mary E. Potorti
Dabrina A. Taylor, Visiting Lecturer, Department of American Studies

The manner in which references to the Vietnam War have become incorporated into American vernacular, particularly in the realm of politics, seems to reflect continued, and indeed, conflicting, strong feelings about the historical lessons of Vietnam. Many of these sentiments regarding the war, particularly as a symbol that continues to influence American notions of heroism, conflict, and sacrifice, are not only evident in, but shaped by perhaps the most accessible, popular form of "history" in America--film. Because it seems clear that gender-role expectations playa large role in fostering such paradigms, this examination focuses on the manner in which masculinity is formulated and influenced by cinematic representations of these social conventions, by investigating the themes present in popular Vietnam War films, particularly in relation to larger prevailing myths and symbols regarding war and masculinity. Narrative structure and cinematic techniques, including photography and editing, are examined in order to decode the messages conveyed by various Hollywood renderings of the conflict, and to decipher what, according to these cultural artifacts, it means to be a man in post-Vietnam America.

YEATS'S "LAPIS LAZULI": FROM MAGE TO MYSTIC

Aaron F. Ralby
Raphael Falco, Professor, Department of English

My undergraduate thesis examines the distinction between magic and mysticism in W. B. Yeats's poem "Lapis Lazuli." Throughout his life Yeats was fascinated by magic and the occult. In his desperate search for proof of the supernatural, however, Yeats blurred the line distinguishing magic from mysticism. Not until he met an actual Indian Swami, Shri Purohit, did Yeats finally come to understand this distinction. After traveling and studying with the Swami, as well as assisting him in translating the Upanishads into clear and simple English, Yeats had come to realize the superiority of mysticism over magic. When he received the statue on which the poem is based he said the figures in it were "prophesying perhaps the Swami and myself at Mallorca." If we read "Lapis Lazuli" as an expression of Yeats's self-idealization,

then we see a profoundly different Yeats from thirty years prior. Rather than the secretive Celtic magician chanting words of power, Yeats imagines himself content. This shift in viewpoint, I argue, marks his realization of mysticism's true nature.

A SYSTEM FOR GENETIC ANALYSIS OF RHODOPSIN IN YEAST

Caitlin T. Reavey, Frank Fiol, Benjamin Nickle
Philip Farabaugh, Professor, Department of Biological Sciences
Phyllis Robinson, Associate Professor, Department of Biological Sciences

The G protein coupled receptor rhodopsin is involved in mammalian low light vision. When hit with a photon of light, rhodopsin undergoes a conformational change causing it to interact with the heterotrimeric G protein transducin. The alpha subunit of transducin exchanges GDP for GTP and dissociates from the beta-gamma subunit. The alpha subunit catalyzes a cascade of reactions that results in a neural response responsible for mammalian vision. This is followed by an adaptation process that resets the sensitivity of the proteins in the signaling pathway. Several mutations in rhodopsin have been discovered which make the protein constitutively active; in this state the receptor cannot return to its original conformation. Constitutively acting rhodopsin mutations lead to the human diseases retinitis pigmentosa and constitutive night blindness. This research will create a model system that allows selection of novel constitutive mutations. The goal of the research is to link rhodopsin to the G protein pheromone response cascade in the yeast Saccharomyces cerevisiae. The pheromone cascade acts by a similar mechanism as the rhodopsin cascade; however, the result of the pheromone cascade is the transcription of the FUS 1 gene. Partnering of a constitutively activated rhodopsin mutant to the pheromone pathway will cause the FUS 1 promoter to be activated indefinitely. To allow for measurement of the cascade activation, lacZ and HIS3 have been inserted after the FUS 1 promoter (Stevenson et al. 1995). Activation of the rhodopsin-yeast pathway will lead to colonies that are His+ and Lac+, whereas colonies without the pathway activated are His- and Lac-.
(*This investigation was supported, in part, by UMBC and Pfizer, Inc. through the Pfizer Undergraduate Research Program at UMBC*.)

BECOMING AN INSPIRING VIOLINIST AND TEACHER

Rachele Sills
Airi Yoshioka, Professor of Violin, Department of Music

Music is important to society because of the very fact that music is ingrained into our lives. Even the thought of a world without music is somewhat inconceivable because music is human nature and it is all around us. Additionally, society values teachers and performers who will be able to keep the tradition of playing music alive. One of the reasons why I want to teach music and better myself as a violinist is because I want children to understand that music is a wonderful world to explore and I want to help them to discover that world, but in order to teach music, I must be "well-versed" in music myself. My goal was to attend a summer music festival (Summer 2004) and to improve myself as a musician in the process. I attended the renowned Meadowmount School of Music and studied with Sally Thomas (a faculty member of The luilliard School). Through these experiences, I have grown musically and I have learned so many things about the music field (such as being patient with myself when I'm playing). I will

be playing Serenade Melancolique by P.1. Tschaikowsky that I have been working on that demonstrates all that I have learned at Meadowmount.

STRUCTURAL STUDIES OF THE MAJOR HISTOCOMPATIBILITY COMPLEX CLASS n TRANSACTIV A TOR (CnT A)

Ashina D. Singh
Colin Garvie, Assistant Professor, Department of Chemistry and Biochemistry

Major histocompatibility complex class n (MHCn) molecules have a significant role in the immune response through their presentation of antigenic peptides to CD4+ T cells, which results in the initiation of the mammalian immune response. The expression of MHcn molecules is regulated by a highly specific multi-protein complex. The class n transactivator protein (CnT A) is an essential component of this multi-protein complex. cnTA is recruited to the MHCII promoter through multiple interactions with DNA bound transcription factors. Once localized to the MHCII promoter, CnT A is responsible for activating expression of the MHCII genes. Our aim is to determine the crystal structure of CnT A, which will elucidate how it regulates MHCII gene expression and self-regulates its own activity. We have expressed and purified different domains of CIIT A in bacteria as fusion proteins in order to increase expression levels and to be able to purify the proteins by affinity chromatography. Removal of the fusion proteins resulted in precipitation of the CnT A domains. Experiments are under way to refold these precipitated domains. In addition, previous studies have shown these domains interact with each other to regulate CnTA activity. We will therefore co-purify the different domains to see if this stabilizes the proteins in solution.

COTE D'IVOIRE AND PAKISTAN: THE CRIPPLING EFFECTS OF MILITARY COUP REGIME TRANSITIONS ON JUDICIAL HUMAN RIGHTS PROTECTION

Daniel J. Smyth
Jeffrey J. Davis, Assistant Professor, Department of Political Science

Judicial independence is essential for human rights protection. Without the impartial force of justice, world governments are unrestrained from subjecting citizens to violence, unlawful arrests, discrimination, and other universally recognized deprivations of freedom. For nations in transition from regimes of tightly centralized power-such as dictatorship, communism, and oligarchy-to liberal democracy, judicial independence often proves difficult to attain. Looking specifically at Cote d'Ivoire and Pakistan, I argue that regime change transitions facilitated by military coups are exceptionally damaging to judicial human rights protection. Cote d'Ivoire and Pakistan both recently experienced military coup transitions and demonstrate the relationship between military coup transitions and judicial human rights protection. In my presentation, I will trace what happens when the judiciaries in these cases are suddenly empowered in a democratic framework following years of political insignificance within a tightly centralized regime. In both countries, a pattern emerges in which national judiciaries are prevented from performing their basic function of shielding citizens from lawless government intrusion by the military and executive branch agents with which the judiciary is supposed to be cooperating.

BIGGER IS BETTER: A VISUAL EXAMINATION OF MALE BODY IMAGE

Arthur Soontornsaratool
Calla E.Thompson, Lecturer, Department of Visual Arts

This body of ten 30 x 30" photographic images examines the awkward relationship between many men and their own bodies. The images represent the heightened awareness and sensitivity that males experience when they confront so-called imperfections. Preliminary images functioning as photographic negatives were created using a black and white photocopy machine and a male model. Specific sections of the male human body were set onto the machine and photocopied onto paper. The photocopies were then placed onto a flatbed scanner and imported into digital image manipulation software that allowed for the manipulation of brightness and contrast values, as well as the cropping and enlarging of the images. The final images were printed using a large format inkjet printer. The photographs serve as a catalyst for further dialogue about what drives people to perceive certain portions of their body in such negative ways.

FEELING "FULL": WHAT ASPECTS OF FOOD ENHANCE SATIETY?

Elena A. Spieker
Zoe S. Warwick, Associate Professor, Department of Psychology

A series of studies in rats examined the effects of several food components on postprandial satiety, defined as the reduced willingness to ingest food following a meal. Method: three-day intake of normal rat food (chow) was measured as baseline. Then a 48 calorie "snack" was given daily for an additional three days, and chow intake measured. The satiety effect of the snack was indicated by the percent suppression of chow intake during the snack phase relative to baseline. A fat snack produced less satiety than a carbohydrate snack. Current research is assessing the effects of taste and volume on satiety by giving isocaloric snacks varying in volume and in sweetness. It is predicted that a sweet-tasting, high volume food will exert a greater satiating effect than a less palatable yet calorically identical alternative. In another study, chow intake was measured following a snack that was either signaled, (or thus expected) or not signaled. A signaled snack produced more satiety (lower chow intake) than a non-signaled snack, indicating that anticipation of a meal may increase its satiating effect. These results suggest strategies for maintaining or decreasing body weight and food intake by enhancing the satiety effect of food.

DEFINING SPECIES LIMITS THROUGH COLOR: ANALYSIS OF THE ORCHARD ORIOLE COMPLEX

Ian E. Tracy, Chris Hofmann,
Kevin E. Omland, Assistant Professor, Department of Biological Sciences

The Orchard Oriole (*Icterus spurius spurius*) and the Fuertes's Oriole (*Icterus spurius fuertesi*) are two closely related orioles believed to have recently diverged. These two orioles have geographically distinct breeding areas: The Fuertes's Oriole breeds in Mexico, and the Orchard Oriole Breeds in the eastern United States. These orioles also differ in plumage coloration. Male Orchard Orioles generally appear chestnut whereas Fuertes's Orioles are described as ochre; however, quantitative analysis of the color

differences is lacking. To further define these differences we used a reflectance spectrometer to gather quantitative color measurements of plumage. We found that Orchard and Fuertes's Orioles color plumage has a unique spectral shape. Analysis of reflectance spectra indicates no overlap in color between Orchard and Fuertes' s Orioles. These findings provide further support for classifying the Orchard and Fuertes' s Oriole as separate species.
(*The Arnold and Mabel Beckman Foundation*)

THE LEGACIES OF THE 1968 WASHINGTON RIOTS IN THE SHAW NEIGHBORHOOD

Hieu Truong
W. Edward Orser, Professor, Department of American Studies

The riots that took place in Washington, D.C. in the aftermath of Dr. King's assassination devastated many of the formerly vibrant black neighborhoods of the District. This event, while overlooked in national discourse, is widely believed to be a watershed moment for the residents of the District. By conducting a case study of Shaw, once the cultural center of D.C.'s black community, I explore the tangible legacies the 1968 riot left on the neighborhood, specifically in regard to its physical, social and economic renewal. These legacies, when fully understood, may help in the development of future planning initiatives by the District as well as other planning initiatives across the country directed toward inner city neighborhoods affected by the social unrest of the 1960s.

THE ROLE OF OLFACTION IN INSECT FEEDING BEHAVIOR

Carlos A. Uquillas
Frank Hanson, Professor, Department of Biological Sciences

Olfaction and gustation play key roles in food selection in sightless animals such as larvae of moths and butterflies. Behavioral experiments on laboratory-reared larvae of tobacco hornworms, Manduca sexta, have shown that these animals have distinct food preferences, and that diet experience affects subsequent food preferences. These experiments used taste tests as an assay (Hanson, 1983), and therefore the current study will employ olfactory tests to determine whether the sense of smell affects preference behavior in the same way as taste. The role of olfaction in food preference and feeding behavior was investigated using fifth instar larvae reared on either an artificial diet or tobacco foliage (*Nicotiana tabacum*). Diet reared larvae which were exposed to different treatments including wax covering of the antennae, Maxillary Palps ablations, and normal animals were tested. Individual larvae were placed in a five-chambered arena, which contained an odor source (plant foliage, leaf extracts, etc.) on one end. The larva was separated from the odorant by a wire mesh screen to ensure that only olfaction was being tested and not gustation. It was allowed to roam in the arena for a period of one hour. The location of the larva was recorded using web cams and photo imaging software. The results showed that larvae reared on artificial diet had a weak, yet statistically significant attraction to tobacco leaf scent. Tobacco-reared larvae also displayed an attraction to tobacco leaf scent, but with a slightly lower preference than diet reared larvae. The preference to tobacco leaf scent was eliminated in the diet-reared larvae which had wax covering its antennae. MP ablated larvae experiments are in progress.

In the second experiment, olfactory preference to an odorant was tested using a Y -maze. The larva climbed up to the diverging point in the Y-maze where it encountered two air streams from different odor sources (control vs. odorant). Choice was determined by observing which arm the larva climbed. The significance of the data collected was tested using a Students t-test. Hanson, F.E. (1983) the Behavioral and Neurophysiological Basis of Food Plant Selection by Lepidopterous Larvae. Hervivorous Insect Host seeking Behavior and Mechanisms (ed. by S. Ahmad), pp. 3-23. Academic Press, New York

STOCHASTIC PROCESS MODELS IN OPTION PRICING

Eric Valentine
Muruhan Rathinam, Assistant Professor, Department of Mathematics and Statistics

The Black-Scholes formula for can options is derived from a partial differential equation, and was used to price options for years. But today, the formula does not apply to the real world. For instance, some of the assumptions of the formula are unrealistic, such as a constant volatility. The Black-Scholes formula can be used to find implied volatility at different strike prices, given a call price. In this project, the effects of skewness and kurtosis on the implied volatility curve are examined. We see that skewness rotates the curve, while kurtosis affects the flatness and steepness of the curve. Volatility tens us how risky the purchase of an option is, hence, a change in the implied volatility curve would affect a buyer's comfort with purchasing an option. This project also investigates the effectiveness of delta-hedging strategies under the Black-Scholes conditions, and using a five-branched lattice with and without transactions costs. In the Black-Scholes case, if a portfolio is rebalanced as the stock price changes, then the cost of the portfolio should equal that of the option. In the case of a five-branched lattice without transactions costs, the portfolio will cost less as the portfolio is rebalanced more frequently. In the case of a five-branched lattice with transactions costs, there is an optimal strategy in which the portfolio is rebalanced with less frequency than the change in the stock price.
(*NSF*)

CLONING AND EXPRESSING THE SACCHAROMYCES CEREVISIAE RIBOSOMAL L4 PROTEIN IN ESCHERICHIA COLI

Sabrina Walborn
Janice Zengel, Senior Research Scientist, Department of Biological Sciences

The ribosome is an essential organelle in all living organisms because it is the structure that synthesizes proteins in a cell. This organelle is composed of ribosomal RNA, which has been credited with the ribosome's functions; however, there are more than 50 proteins present in the ribosome that may also play a role in protein synthesis. One of these proteins, L4, lines a portion of the ribosome's peptide exit tunnel in both Escherichia coli and Saccharomyces cerevisiae. The L4 genes of both species are conserved, suggesting that the proteins' functions are similar. The L4 gene of S. cerevisiae was cloned into the pGEM-T vector so recognition sites for the restriction enzymes Pst I and SphI would flank the L4 gene fragment. Using these restriction enzymes, the gene was then excised from pGEM-T and cloned into the pBAD18 vector. The resulting recombinant plasmid will be expressed in E. coli to see how the ribosome's function is altered by the presence of a foreign L4 protein. The cloned L4 gene also contains

a HIS-6 affinity tag, which will make it possible to track the gene in E. coli and later purify the protein for biochemical studies.
(*MARC Program and the National Science Foundation*)

THE EMPOWERED ACCOMPANIST - A COLLABORATIVE PIANIST'S STUDY OF COPLAND SONGS

Stefanie E. Watson
Rachel Franklin, Professor of Piano, Department of Music

As a pianist, it has long been my interest to work with other musicians, not exclusively as a soloist nor merely as an accompanist in the background. There is something deeply exciting about the energy between two or more performers, each important in their own right, with strong musical interpretations working toward a common goal. As a way of furthering my knowledge and skills in this field of collaborative piano, this past summer I attended the Piano Program of the Chautauqua Music Festival in Chautauqua, New York. While there, I worked with another pianist who played the orchestral reduction for my interpretation of F. J. Haydn's D major Keyboard Concerto, while I also focused my efforts on developing a stronger technique as an individual player. Since returning, I have been able apply these skills in collaborating with soprano Christie Finn through a study of Aaron Copland's song cycle, Twelve Poems of Emily Dickinson. We have worked to achieve, both as individuals and as a team, a unique interpretation of the ways in which Copland magnifies the poetry through his musical settings. The culmination of this research is in the performance of the songs and our joint communication of ideas.

ECHOES FROM MARGARET FULLER'S CONVERSATION: WOMAN IN THE NINETEENTH CENTURY AND FULLER'S MODERN APPEAL

Scott White
Christoph Irmscher, Professor, Department of English

Margaret Fuller is typically regarded as a proto-feminist by some and as a footnote in American literary history by others. However, Fuller's Woman in the Nineteenth Century (1844) is evidence of how forward-thinking she truly was. Woman is written in a "conversational style" that highlights the many important binary relationships Fuller puts forth in her essay, such as Man and Woman, Old World and New World, Past and Present. Fuller is able to reconcile these multiple dualities in a way that other Transcendentalists, such as Ralph Waldo Emerson, do not. Most importantly, Fuller does not promote solitude like Emerson, but instead shows an interest in fostering relationships, which manifests itself in how she examines and reconciles the multiple dualities listed above as well as in her "conversational style." Fuller's negotiation of dualities in Woman points towards a problem faced by modem readers that of having to balance an overwhelming record of human history with a commitment to working in the present. In this way, Margaret Fuller is a far more modem writer than she is given credit for.

INITIAL STAGES OF AMYLOID-f3 AGGREGATION REVEALED BY ELECTRON PARAMAGNETIC RESONANCE SPECTROSCOPY

Olusegull Williams,
Veronika A. Szalai, Assistant Professor, Department of Chemistry & Biochemistry

Alzheimer's disease (AD) is a degenerative disease of the brain characterized by build-up of insoluble plaques containing fibrils of beta-amyloid (Af3) protein. Nascent fibrils might be responsible for the effects of AD, but these early stages of fibril formation are largely uncharacterized. We seek to further understand the initial stages of both the kinetics of fibrillization and fibril structure through electron paramagnetic resonance (EPR) spectroscopy. Attachment of an EPR-detectable label to the Af3 peptide provides information about the environment of the label, indirectly allowing us to follow changes in Af3 structure. To attach the label, mutant peptides are used in which cysteine replaces a native amino acid in Af3. The mutant, unlabeled peptide Ai3F19C fibrillizes normally, but less fibrillization is observed for labeled Ai3F19C. EPR spectroscopy showed that the environment of the label attached to Ai3F19C did not change as a function of fibrillization time, most likely due to the presence of unreacted label. To remove unreacted label, labeled peptides were purified by chromatography. The component corresponding to labeled peptide produced an EPR spectrum. In conclusion, we have developed a purification protocol for the labeled Af3 peptides. These purified peptides will be used to conduct further fibrillization experiments.

KINETIC STUDIES ON CONFORMATIONAL CHANGE OF GENE 32 PROTEIN

Aye T. Win
Richard Karpel, Professor, Department of Chemistry and Biochemistry

Bacteriophage T4 gene 32 protein consists of the N-terminal domain, the core domain and C-terminal domain. The C-domain and the adjoining portion (flap) of the core domain mimic single-stranded DNA, suggesting that this flap is associated with the ssDNA binding site of the non-DNA bound form and with the N-domain of an adjacent DNA-bound gene 32 protein upon cooperative binding. According to the model, it must flap out of the binding site, resulting in its conformational change. These insights have motivated us to study kinetics and the mechanism of the association of various truncates of the protein with single-stranded nucleic acids. Investigating the salt dependence of the binding kinetics of *1, which lacks the C-domain, gives two exponential decays which may correspond to protein-DNA and protein-protein binding interactions respectively. Analysis of binding kinetic data for *1 and *III truncates and a comparison with that for the whole protein leads to a deeper understanding of what the mechanism of binding. These experiments may shed light on the rate-determining step for protein-DNA binding and its dependence on the proposed conformational change. We have utilized the stopped flow technique which monitors changes in florescence as the protein and DNA are rapidly mixed.

THE EFFECT OF REWARD AND MOTIVATION ON COGNITIVE PROCESSES, AS MODELED BY THE PACED AUDITORY SERIAL ADDITION TASK (PASAT)

T. Andrew Windsor
Julie B. Schweitzer, Assistant Professor, Department of Psychiatry, UMAB
Rachel Brewster, Assistant Professor, Biological Sciences

The Paced Auditory Serial Addition Task (PASAT) is a well-established neuropsychological test of frontal lobe functioning and executive functioning. It is a measure of working memory, processing speed, and attention, and is thusly a model of cognitive processes. Traditionally, the PASAT has been used to assess executive functioning. The aim of this project is to examine the effect of reward on performance of an executive functioning task. Subjects completed one control condition and three experimental conditions. The three experimental conditions had variable compensation (1 cent, 5 cents, or ± 5 cents) for each trial per session. Each condition was run at 3 different inter stimulus intervals (ISI; 2.0 s, 1.6 s, & 1.2 s) to further examine the interaction between reward and difficulty level (ISI). Each subject was tested at each condition and ISI. Results of this study may benefit the understanding of the interaction between motivation and neuropsychological functioning. This could lead to novel approaches for development of cognitive rehabilitation strategies.

MOLECULAR EVOLUTION OF CYTOSKELETAL PROTEINS: THE PLATEINS OF EUPLOTID CILIATES

JunXu
John A. Kloetzel, Associate Professor, Department of Biological Sciences

In euplotid ciliates, a novel family of proteins, termed plateins, forms a monolayer of skeletal plates below the plasma membrane which provides structural support to the cell. A systematic search for 13/y-plateins in *Euplotes muscorum* was conducted via peR, utilizing a gene-specific primer aided by a telomeric primer. The products underwent a second round of amplification using a "nested" primer; the resultant DNA products were cloned via bacterial transformation and subsequently sequenced. An analysis of the DNA sequences obtained shows that l3Iy-plateins are highly conserved. Only a handful of nucleotide substitutions (with fewer still amino acid substitutions) were found in the main repeating platein domain between *E. aediculatus* and *E. muscorum*, two quite distant species of Euplotes. The infrequency of changes in this region of the protein speaks to its importance in maintaining the integrity of the cortex; in contrast, a 'linker' region between the plateins' two repetitive domains shows a much higher frequency of amino acid substitutions. BLAST searches indicate that homologs of plateins exist in Drosophila, mice and humans. The present findings suggest that these platein genes, conserved by evolution, may be of paramount importance in cell structure generally. The Euplotes cortex is completely disassembled and restructured with each cell division; information on which protein domains are critical for this assembly process will allow a better understanding of how proteins build higher order structures.

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Phuong Pham
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Phuong Pham
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Aaron Ralby
Caitlin Reavey
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Hieu Truong
Carlos Uquillas
Stefanie Watson
JunXu

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Phuong Pham
Mary Potorti
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Carlos Uquillas

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Melissa Blackman
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PhuongPham
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Aaron Ralby
Ashina Singh
Eric Valentine
Scott White
Olusegun Williams
JunXu

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UNCF.MERCK
UNDERGRADUATE FELLOWS
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