



2008 SRS

*14th ANNUAL
SUNY NEW PALTZ
STUDENT RESEARCH
SYMPOSIUM
ABSTRACT BOOK*

STATE UNIVERSITY OF NEW YORK
NEW PALTZ

*14th ANNUAL
SUNY NEW PALTZ
STUDENT RESEARCH SYMPOSIUM*

Friday April 25, 2008
Lecture Center, North Lobby
1:00-3:00 p.m.

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Sponsored by:
The Research, Scholarship and Creative Activities
College Auxiliary Services

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Maureen Morrow, RSCA Director

The 2008 Student Research Symposium

Once again, as the academic year comes to a close, we have this opportunity for scholarly exchange amongst our faculty and students. The 2008 Student Research Symposium will include presentations by 53 students representing 12 departments. This is an occasion for us to share our accomplishments in a spirit of camaraderie.

The Student Research Symposium is sponsored by the Research, Scholarship and Creative Activities (RSCA) Program. The mission of the RSCA program is to encourage and support student- faculty collaboration in the active participation of scholarly and artistic activities that generate new knowledge or works.

Such activities enable students to gain knowledge, skills, and confidence to contribute as productive members of their professions and contribute to a learning environment which is challenging, student-centered, and personalized.

Acknowledgements

We would like to thank the following people for their generous support of this event:

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Tabitha Holmes,(Psychology), Shafiul Chowdhury (Geology), Coleen Lougen (Library), Yoav Kaddar (Theatre Arts), Preeti Dhar (Chemistry), Eve Waltermaurer (Sociology), Anita Gonzalez (Theatre Arts), Mary Roehm (Art Department), Jason Wrench (Communication), Tom Nolen (Biology)

Welcome to the Student Research Symposium

Among our chief goals for New Paltz students are that they will forge close ties with faculty mentors and prepare themselves for graduate or professional school. This is why I'm so proud about the growing numbers of undergraduates involved in research projects with faculty. Our student research initiative provides wonderful ways for students to push beyond the boundaries of their knowledge and to see just how talented they are as researchers and junior scientists. But surely the most enduring aspect of their research will be the bonds that they forge with faculty who will be intellectual guides and friends for the rest of their lives. I salute all of the students and faculty who have given so selflessly of themselves to make this program work—and who embody New Paltz at its best.



Steven G. Poskanzer
President

The opportunity to engage in research in a meaningful way – where the answers are not already known and students must retrieve, understand and assimilate information from current research in the field – provides both a deeper appreciation for their discipline and, often, helps students find their career direction.



We realize that successful student research requires a great commitment of faculty time and attention. Helping to plan, monitor, and guide the project as well as helping to shape the final written and presentation product must be carefully done. And the advisory committee and campus-wide coordinator play very important roles in the management of the entire process and in organizing events such as this symposium. But there are rewards for faculty as well.

As I reflect on my academic career, I find that working directly with students in my lab has been my most fulfilling teaching experience. The bonds that we formed by working together on a day to day basis lasted long after the students finished their undergraduate degrees. Most of the several dozen students who undertook research projects in my lab went on to complete doctoral degrees and kept in contact with me and their fellow students during their further study. I hear from them from time to time even now. As faculty members, we take pride in the accomplishments of our research students throughout their careers.

I would like to congratulate students and faculty for the work that you've completed this year and hope that your research activities will continue to be fulfilling.

David Lavallee
Provost and Professor of Chemistry

On behalf of the Research, Scholarship, and Creative Activities Advisory Board, I would like to welcome you to the 2008 Student Research Symposium. This event is the 14th consecutive celebration of student-faculty scholarship at SUNY New Paltz.



As you are aware, the process of producing scholarship through research and/or creative activities is both difficult and exciting. I am certain the faculty- student interactions you experienced in this process were unique and stimulating. Please know that these experiences are a rewarding part of the job of a college professor; so do stay in touch after you have graduated. It brings us all great joy and inspiration to hear of your post- New Paltz adventures and success.

I hope this event brings you fulfillment in presenting the results of your work and inspiration from your fellow students' accomplishments.

Maureen Morrow
RSCA Director
Associate Professor, Biology

Photo credits:
President Poskanzer by Marlis Momber
Provost Lavalley by the Office of Public Affairs
Maureen Morrow by Christopher Pryslopski

Research, Scholarship and Creative Activities Program

Faculty-student collaborators may propose projects for support through the Summer Undergraduate Research Experience (SURE) and Academic Year Funds programs (AYURE). Both of these programs are competitive and are selected for support by a faculty committee. Congratulations to all of this year's award recipients (see pages 26-27).

SURE

The focus of the SURE program is to encourage intensive student participation in an aspect of faculty research.

Each student participant is supported with a stipend for the 8-week summer project and is expected to devote at least 35 hours per week to the project. Faculty mentors direct and provide guidance to participating students as they work on a particular aspect of the faculty's research program. As a goal of this program is to encourage ongoing faculty-student collaboration, and thus students are encouraged to continue working on the project during subsequent semesters.

ACADEMIC YEAR FUNDS

This program supports student- faculty collaborations on projects that span the disciplines. Projects that generate new knowledge or works are eligible for support. Funds for supplies and support of the research, scholarship or creative activities are provided through this program.

STUDENT CONFERENCE TRAVEL AWARD

The RSCA program supports students to present the results of the collaborative work at professional conferences. Mentors are also supported for travel with the student.

RESEARCH PREPATION

The RSCA program would like to announce a new course that is aligned with the undergraduate research program goals: ENG 399 Research Methods in the Humanities and Social Sciences (1 credit modular course).

For more information, please visit our web page: www.newpaltz.edu/studentresearch.
You may also contact: Maureen Morrow, Director, Undergraduate RSCA
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ARCHAEOLOGICAL GEOCHEMISTRY IN SOUTHERN PERU

Heather Slivko-Bathurst (Anthropology, undergraduate)

Faculty Mentor: Ken Nystrom (Anthropology)

Stable isotopic analysis of archaeological skeletons has provided useful and exciting results in archaeology. In particular, isotopes serve as geochemical signatures that can be used to reconstruct human migration and mobility based on the unique biochemical properties of tooth enamel and bone. One can identify migrants in the archaeological record by comparing the isotopic ratios in tooth enamel, which forms completely between four and twelve years of age, to the ratios in bone, which reforms several times throughout life. While strontium isotopes have proven valuable in this type of research, the stable isotopes of lead are becoming more frequently used. The first step in evaluating the utility of lead isotopes for such research, however, requires determining the potential influence of any natural or anthropogenic diagenetic processes. The current research will collect geologic samples from the Osmore Valley in southern coastal Peru, which was inhabited by the Chiribaya culture between AD 900-1400.

Both surface and buried samples will be collected in order to evaluate the following hypothesis: modern sources of anthropogenic lead have a significant influence only on surface sediments close to modern cities and do not affect the isotopic composition of buried sediments. The results will allow researchers to decide whether or not stable lead isotopes are appropriate to use.

CULTURAL MODELS OF COURTSHIP IN AMERICA

Aaron Leo, anthropology major

victor de munck, advisor

Cognitive Anthropologists assess that culture exists in the minds of individuals. Expanding on this notion, many researchers have identified schemas, a model of behavior that help individuals understand their surroundings, as a force influencing behavior. Schemas that are shared over populations are referred to as cultural models. In order to develop a cultural model of romantic love among Americans, twenty individuals of varying experience and demographics participated in a card sorting interview. One set of cards had events in a typical relationship and the other had common emotions in a relationship. All terms were generated from free list surveys. The event cards were sorted chronologically, and the emotion cards were then placed where the participant believed they began in the relationship. Strands of yarn were used to indicate how long each emotion lasted. From these data, charts have been compiled that describe different cultural models of courtship and variations within and between these models. Also a flow chart has been developed to outline different courtship pathways as represented by the interview material. Such information can be useful to understanding many patterns of behavior in addition to courtship.

THE 2007 US SOCIAL FORUM: NEW VOCABULARIES OF SOCIAL JUSTICE

Flannery Spring-Robinson

Faculty Mentor: Benjamin Junge (Anthropology)

We present issues and findings from investigation of the United States Social Forum (USSF), a large grassroots activist summit held in Atlanta, Georgia in June 2007. With its official slogan, “Another World is Possible! Another U.S. is Necessary!” the USSF brought together more than 15,000 social movement organizers to voice critiques of—and develop new strategies to resolve—social, political, and economic marginalization in the U.S. This presentation looks at the issues raised by organizations participating in the USSF—specifically, at the language used to represent problems, causes, and possible solutions. Our data is a set of 30+ transcribed speeches from “People’s Movement Assembly,” which took place on the final day of the Forum, and during which organization representatives each made a short statement of their resolutions for future work. My poster presentation will display the key terms, buzzwords and slogans used by organizations that participated in the USSF, and will offer some generalizations about the status of grassroots movements in the United States in the early years of the 21st century. I will also focus on a specific case study: the presence of groups representing Native American peoples. I will discuss their specific concerns and frustrations, as well as tensions between their organizations and organizations representing other causes and communities. Finally, I show how the vocabularies of the USSF both reflect the international grassroots justice movement and have taken a form distinctive to the United States.

ISOLATION OF THE DASH COMPLEX IN C.ALBICANS

Matt Zubrowski (Biology, undergraduate)

Faculty Mentor: Jennifer Waldo (Biology)

The DASH protein complex is a decameric protein complex, which forms around the mitotic spindle fibers. Although the mechanism is yet to be understood, it is known that the presence of the DASH complex is necessary for normal chromosomal separation. The DASH complex has already been studied in the yeast strains *S. cerevisiae* and *S. pombe*. To further our understanding of this important protein complex, *C. albicans*, an organism in which the DASH complex has yet to be studied, was chosen. In terms of evolution, *C. albicans* falls “in between” *S. cerevisiae* and *S. pombe*. Characterizing the complex in these three yeast strains will help us understand how DASH evolved. To complete our project we used multiple techniques however the focus was DNA cloning. The ultimate goal is to isolate DASH in *C. albicans*. To this end, we are constructing strains of *C. albicans* that have modified DASH complex genes. The modification is the addition of 6-histidines to the protein. This tag allows for the separation of DASH utilizing a Nickel column; 6 histidine residues will bind to the Ni column, which in turn binds the DASH complex. To add the 6-His tag, we are modifying a PCR-based system that has been developed for addition of a GFP tag. Our work has focused on altering the plasmid pMG1602 to replace the GFP sequence with the 6-His sequence.

ISOLATION AND PURIFICATION OF DAD1 AND DAD3

Elena Adjei (Biology, undergraduate)

Faculty Mentor: Jennifer Waldo (Biology)

The yeast DASH complex in *Saccharomyces cerevisiae* is a constituent of the kinetochore and is essential for separation of sister chromatids in mitosis. The complex forms closed rings around the microtubules that attach to the kinetochores during anaphase. The complex consists of ten subunits (ask1, dam1, spc 34, duo1, spc 9, dad1, dad2, dad3, dad4, and hsk3) that surround and move along the microtubules. Without this DASH complex in *S. cerevisiae*, sister chromatids would remain attached after cell division. A similar complex has been identified in *S. pombe* which also contain 10 subunits but it is not as well characterized as in *S. cerevisiae*. Interestingly, the *S. pombe* DASH is not essential for viability, but a lack of the complex displays defects in chromosome separation. We are currently interested in studying the biochemical and cellular characteristics of the DASH complex in *Candida albicans*. *C. albicans* is evolutionary related to both *S. cerevisiae* and *S. pombe*. Eight subunits were identified by using bioinformatics; spc 34 and dad 4 were not. In this study, we are trying to isolate and study the dad1 and dad 3 proteins from *C. albicans*. The pET 15b was used to clone these proteins and *E. coli* cells were used to over express the proteins. Once we isolate the proteins and purify them, we can then crystallize the protein and study its structure and function more efficiently, and compare *C. albicans* DASH to that from *S. cerevisiae* and *S. pombe*.

PURIFICATION OF HUG1 PROTEIN

Shadi Ibrahim (biology, undergraduate)

Faculty Mentor: Jennifer Waldo (bio)

In *Saccharomyces cerevisiae*, the Hug1 protein plays an important role in repairing DNA damage due to UV radiation exposure or any other damaging factors. The 68 amino acid protein is expressed in cells undergoing replication arrest, including treatment with hydroxyurea. It is speculated that it might require the MEC1 pathway for its expression. Hydroxyurea causes DNA replication to pause, resulting in a series of reactions that culminate in the hyperphosphorylation of CRT1 and the release of the transcriptional inhibition of a number of genes that involved in DNA repair, including Hug1. Purification and crystallization of the Hug1 protein is being attempted in order to determine its structure, which may help us to develop a better understanding of its function in the cell. We set up 90 wells containing 90 different solutions varying in the salt content, pH and the type of buffer. From these trials, two conditions yielded potential protein crystals. In order to optimize Hug1 crystallization, we set up number of variation of the two initial solutions by altering percentage of the salt contents and the pH. To date, we have not been able to repeat the initial crystallization event. This may be due to amino acids fused on to Hug1 during its heterologous expression in *E. coli*. We are in the process of re-cloning Hug1 to omit this sequence and will re-screen this version of the protein for crystal growth.

CLONING OF THE DAD-1 GENE INTO PET-15B

Adam Nassery (Biology, undergraduate)

Faculty Mentor: Jennifer Waldo (Biology)

The Dad-1 protein is a critical component of the DASH complex, which is necessary for accurate chromosome segregation at the kinetochore in yeast *S.cerevisiae*. The DASH complex forms closed rings around microtubules, thus facilitating the binding of the kinetochore to those microtubules, and allowing for proper cell division to occur. Dad-1 has previously been studied in this lab, and the purified protein was found to multimerize. We hypothesized that this multimerization may be due to the inclusion of a Lumio tag on the Dad-1 protein (the Lumio tag - CCPPCC - is used for fluorescence detection and is encoded by the pET161 vector). To test this, we set about constructing an expression plasmid without the Lumio sequence. The plasmid chosen was pET-15b. The cloning process began with the preparation of the plasmid, which involved transforming pET-15b into top-10 cells. The Dad-1 gene was prepared by obtaining the appropriate primers and then amplifying the gene via PCR. Both the plasmid and the gene were digested with restriction enzymes and purified. Following this, pET-15b and Dad-1 were ligated. We are currently in the process of choosing the best plasmid, which will then be transformed into DE3 E.coli cells, and induced with IPTG, to produce the Dad-1 protein. Following this, an SDS-PAGE gel will be run to see if expression occurred, and to assess the degree of multimerization.

LIGAND BINDING DOMAIN FOR C.INTESTINALIS CIHT13L06

Babar Khan (Biology, undergraduate)

Faculty Mentor: Jeff Reinking (Biology)

Ciona intestinalis, a metazoan marine organism, having had its complete genome sequenced in the past decade, serves as a model organism that provides a system for exploring homologous traits to the chordate lineage. Using *C. intestinalis* genes encoding for various Nuclear Receptor (NR), proteins that function in essential organismal processes, I set out to locate and identify the types of ligands that bind to the NR. I spliced out Ligand Binding Domains (LBD) of the *C. intestinalis* ciht013L06 and annealed to a plasmid for insertion into bacteria, allowing experimentation directly on the LBD domain. This will aid in determination of the nature of the LBD without influence from other parts of the NR. Successful completion of project will allow harvest of bacteria containing LBD in large quantities, allowing testing to take place to determine which ligands bind to the domain and thereby pairing ligands with their respective NR. It might be possible that more than one ligand binds to a NR therefore the type of molecular work that will be used to study the LBD will involve as many different methods of testing as possible to determine the type of ligand that binds. Coupling ligands with their relevant NR will provide insight for not just NR in *C. intestinalis*, but due to homology, information concerning the ligand-NR interaction within other chordates such as humans will also be revealed.

MOLECULAR STUDIES OF *C. INTESTINALIS* NR CITB033O5

Caithlin MacNeil (Biology, undergraduate)

Faculty Mentor: Jeff Reinking (Biology)

Nuclear receptors (NRs) are a superfamily of transcription factors that have the ability to directly bind to DNA and regulate gene expression. For this reason, nuclear receptors influence a wide range of important biological functions, such as metabolism, development, disease and reproduction. The regulation of gene expression by nuclear receptors occurs when a NR ligand is present. Because not all ligands have been identified for NRs, the discovery of ligands for their orphan nuclear receptors is a continuous study of research. Thus, the following research focuses on discovering ligands in the simple, well-defined model organism *Ciona intestinalis*. Using a bioinformatics approach, I (1) predicted the domain boundaries of the LBD on the *C. Intestinalis* NR gene target, CITB033O5, (2) explored the targets homology among various organisms, and (3) developed the appropriate PCR primers for the amplification of the target. Using these primers, I created a recombinant plasmid designed to express the CITB033O5 LBD in *E. coli*. I plan to use the cultured cells to produce a surplus of proteins to allow for ligand testing with hopes of identifying the correct ligand to its protein expressed with the LBD. In doing so, I will have provided the foundation for adopting the ligand to its appropriate NR and, thus, have helped de-orphanize yet another NR. Because all NRs share a similar domain architecture among many organisms.

ISOLATION OF *C. INTESTINALIS* LBD ON NR CITB004N11

Cody Secor (Biology, undergraduate)

Faculty Mentor: Jeff Reinking (Biology)

C. intestinalis is an aquatic tunicate whose genome is the smallest of any experimentally manipulable chordate and has served as a major experimental model for today's biologists. This organism provides a good system for exploring the evolutionary origins of the chordate lineage. The *C. intestinalis* genome encodes a variety of nuclear receptors, a class of proteins found within the nuclei of cells that are responsible for sensing the presence of ligands; typically small organic molecules. In response, these NRs work in accordance with other nuclear proteins to regulate the transcription of specific genes, thereby controlling a wide range of biological functions such as metabolism, development, and disease. NRs are termed "orphans" when the natural ligand has yet to be identified. Our goal is to discover ligands for these orphans, thereby adopting them. I used in silico domain mapping techniques to putatively identify the portion of the NR citb004n11 that interacts with the ligand, known as the ligand binding domain(LBD). The region of DNA corresponding to the LBD of citb004n11 was then cloned into a recombinant expression plasmid. Once transformed into *E.coli*, this DNA construct allows us to produce and harvest large amounts of the LBD. The purified citb004n11 LBD will be used in subsequent experiments to identify complementary ligands capable of initiating cell signaling pathways. In doing this we may be able to draw conclusions about similar processes in other chordates.

BREEDING BIRDS AT THE MOHONK PRESERVE

Joseph Chernek (Biology, graduate)

Faculty Mentor: Carol Rietsma, Lawrence McGlinn (Biology, Geography)

I determined changes in resident and migratory breeding birds over 15 years in a plant community called the Pitch Pine Oak Heath Rocky Summit at the Mohonk Preserve in New Paltz, NY. I learned to identify bird and vegetation species found in this habitat, I participated in the 2007 Breeding Bird Census (BBC), and I digitized and analyzed BBC data for five-year periods of time from 1992 through 2007 using a geographic information system (GIS). Two sets of data were collected in 2007 to determine observer variability. Changes in resident species were the inclusion of the downy woodpecker (*Picoides pubescens*), northern cardinal (*Cardinalis cardinalis*), and tufted titmouse (*Baeolophus bicolor*) in BBC data. Changes in short distance migrants included a decrease in eastern towhee (*Pipilo erythrophthalmus*) breeding territories, the absence of the brown-headed cowbird (*Molothrus ater*) since 1997, and a decrease in hermit thrush (*Catharus guttatus*). Changes in long distance (neotropical) migrants were increases in the indigo bunting (*Passerina cyanea*) and red-eyed vireo (*Vireo oliveaceus*). Climate data showed increased temperature and increased precipitation over 111 years of data at the Mohonk Lake Cooperative Weather Station. Habitat change has occurred in the study area from 1986 through 2007 associated with gypsy moth (*Lymantria dispar*) attack, drought, the absence of fire, and an ice storm in 2002.

THE EFFECT OF ACID ON THE USPA GENE EXPRESSION

Kara Ramos (New Paltz High School, Senior)

Faculty Mentor: Maureen Morrow (Biology)

The *uspA* gene in *Escherichia coli* is important to the survival and stress response of these bacteria. In nature, *E. coli* can come into contact with acid, especially during the brief period where farmers treated meat with acid to prevent the spread of bacteria. This experiment will test the effect of acid on the expression of the *uspA* gene. In previous studies, it has been found that the *uspA* gene responds to heat shock among other stresses. The current hypothesis is that acid will increase the production of *uspA*. In this experiment, *E. coli* AF634 will be used because it has a *uspA-lacZ* reporter construct. Bacteria will be grown at a pH of 2, 3, 4, and 6.6 at 28 degrees Celsius. A positive control will be grown at 42 degrees C to stimulate the *uspA* gene. A beta galactosidase assay will be used in order to measure the activation of the *uspA* gene. If pH activated the *uspA* gene, there would be a higher reading in cells incubated at an acidic pH as well as cells incubated at the higher temperature. The cells with normal media at a pH of 6.6 should not show high levels of beta galactosidase. The results of this experiment could be compared to other strains of *E. coli* such as the dangerous 0157:H7. These methods could also be applied to other strains of bacteria that also contain the *uspA* gene.

EFFECTS ON TYROSINASE ACTIVITY FROM PLANT EXTRACTS

Igor Gembitsky (Biology, undergraduate)

Faculty Mentor: Preeti Dhar, Maureen Morrow (Chemistry, Biology)

Psoralea corylifolia, a plant native to India, has been used in traditional medicine to treat vitiligo. Furanocoumarins, present in this plant, are known to induce melanogenesis. Furanocoumarins are also documented to occur in high concentrations in a local North American plant, *Heracleum maximum*, however this plant has not been used traditionally to treat vitiligo. The tyrosine pathway is known to be responsible for the production of melanin in the skin, with the activity of tyrosinase being an integral part of melanogenesis. The objective of this research was to quantify the effects on tyrosinase activity of both plant extracts, and thereby elucidate on the reasons why one plant has been used in traditional medicine and the other one has not.

HIERARCHICAL STRUCTURES OF NATURAL ACELLULAR POLYM

Kseniya Orlik (Biology/ Chemistry, undergraduate)

Faculty Mentor: John P. Harrington (Chemistry)

It has been our premise that natural acellular Hbs may serve as models for the development of therapeutic hemoglobin-based oxygen carriers (HBOC). An understanding of how other organisms utilize acellular oxygen carriers and maintain their structural integrity and redox stability within their circulatory systems is vital for the design of a safe and effective red cell substitute. Biochemical and biophysical characterizations of naturally available acellular Hbs are warranted to determine the unique structural and chemical properties that contribute to their success as acellular oxygen carriers. Our attention has focused on the acellular Hbs from a terrestrial (*Lumbricus terrestris*) and marine (*Arenicola marina*) invertebrate, testing the hypothesis that their unique hierarchical structure and functional properties are significant in their success as natural oxygen carriers. During the course of this project, structural and redox properties of these highly polymeric invertebrate Hbs were investigated. Structural stability was evaluated by two methods: 1) alkaline pH dissociation of the intact duodecameric (in vivo molecular hierarchy) molecule by gel chromatography (pH 7.0-9.1 range), and 2) classical urea unfolding studies. Redox properties were examined by a comparison of the rates of autoxidation of each of these invertebrate Hbs and compared to a uniquely cross-linked high molecular weight polymeric hemoglobin, (OxyVita HB), that is presently being developed for pot. appl.

PHOTOTOXICITY OF HERACLEUM & PSORALEA FRACTIONS

Ingrid Walfish, Alisha Philip (Chemistry, undergraduate)

Faculty Mentor: Preeti Dhar (Chemistry)

Psoralea corylifolia and *Heracleum maximum* are plants belonging to different families but rich in a class of compounds called furanocoumarins. Furanocoumarins are phototoxic compounds and plant extracts containing them can be easily detected using brine shrimp bioassay. Earlier studies in our lab have shown that ethanol is a good solvent to extract the furanocoumarins from both the plants. The brine shrimp bioassays conducted earlier in our labs were done on ethanol extracts and the *H. maximum* ethanolic extracts, in particular, showed a lot of toxicity. Much lower toxicity was seen with *P. corylifolia*. We wanted to see if we could fractionate the ethanolic extract further so that the fraction containing the toxic substance(s) would be separated. The two plants were extracted with ethanol using the soxhlet extraction procedure and the ethanolic extract was concentrated to remove the solvent. The extract was resuspended in water and extracted with hexane and ethyl acetate to yield three fractions. Each of these fractions was concentrated and subjected to brine shrimp bioassay. We expect that after subjecting the ethanolic fractions to sequential extraction procedure, we would be able to find a solvent in which toxic material would be separated. Results of this experiment along with modifications of the bioassay would be discussed.

CHLORIDE IONIZATION AND UV-VIS SPECTROSCOPY

Kenneth Hassler, Aidan Benson, Miriam Rossi, Francesco Caruso (Chemistry, undergraduate)

Faculty Mentor: Daniel Freedman (Chemistry)

Arene-ruthenium- complexes have been investigated for their anti-cancer properties. We report UV-Vis and ¹H-NMR experiments characterizing the chloride ionization of two arene-ruthenium Beta-diketonate complexes, [(p-cym)Ru(acac)Cl] and [(p-cym)Ru(curcumin)Cl]. The equilibrium constant for the aquation of [(p-cym)Ru(acac)Cl] was determined to be 0.95(9) at 25C. [(p-cym)Ru(curcumin)Cl] was not sufficiently soluble in water to directly determine K for chloride ionization. UV-Vis and ¹H-NMR data indicate that [(p-cym)Ru(curcumin)] is very slightly ionized in acetone solution and more completely ionized in methanol solution. ¹H-NMR data indicates that the exchange between coordinated and solvated chloride is rapid in methanol on the NMR time-scale. Analysis of the UV-Vis spectrum of [(p-cym)Ru(curcumin)] suggests that the intense visible absorbance bands can be assigned to intraligand curcumin transitions. The spectroscopic behavior of [(p-cym)Ru(curcumin)Cl] in aqueous solutions is complex. Preliminary data suggests that the compound may be oligomerizing.

THERMODYNAMIC STUDIES OF LNA IN DNHAIRPINS

Corinne Szewcyk (Chemistry, undergraduate)

Faculty Mentor: Pamela St. John (Chemistry)

Model sequences containing DNA and a mixture of DNA and LNA, composed of GAAA tetraloops with varying numbers of complementary bases within the stem have been used to help understand how LNA can affect a stable single-stranded structure in short oligonucleotides. Melting curves of the hairpin structures, obtained from UV-Vis spectroscopy, have been used to study the differences in the thermodynamics of each strand when LNA is incorporated into the hairpin. For example, noticeable differences in the changes in enthalpy and entropy have arisen from incorporating LNA into the loop of the hairpin. The effects of position and number of LNAs in the sequence on the stability of the hairpin will be discussed.

SYNTHESIS OF SKELETALLY MODIFIED α -PINENE DERIVATI

Cynthia Colon, John Menendez, Daniel Cohen (Chemistry, undergraduate)

Faculty Mentor: Preeti Dhar (Chemistry)

α -Pinene, one of the constituents of pine oil is known to have considerable antimicrobial activity. α -Pinene is a rigid bicyclic monoterpene with a double bond that allows for variety of skeletal and functional transformations. Testing and comparing the antimicrobial activity of each of the α -Pinene derivatives resulting from either skeletal or functional group transformations could help us better understand how the structure of α -Pinene affects its antimicrobial activity. Previous work from our lab focused on the functional group modification of α -Pinene. To further understand the link between structure and activity, we have focused our attention on reactions that would alter the α -Pinene carbon skeleton. In this project we synthesized skeletally altered α -Pinene derivatives using standard organic reactions starting with S- α -Pinene. These derivatives have been purified and characterized using spectroscopic methods. Synthesis of these compounds would be presented. In the future, these compounds would be tested for their antimicrobial potential using thin-layer-chromatography (TLC) - autobiographic assay.

PREPARATION, CHARACTERIZATION, AND KINETIC STUDIES OF RUTHENIUM-THIOCYANATO LINKAGE ISOMERS

Lucas Vandenburg

Daniel A. Freedman

We report the first isolated and structurally characterized ruthenium-thiocyanato linkage isomers. Reaction of [(p-cym)Ru(bpy)Cl]⁺ with SCN⁻ in methanol gives two products as determined by ¹H-NMR. Column chromatography using neutral alumina coated with 5% by weight of Hg(NO₃)₂ separates the mixture into orange (1) and yellow (2) compounds. X-ray structures show that 1 is [(p-cym)Ru(bpy)(SCN)]PF₆ and 2 is its linkage isomer [(p-cym)Ru(bpy)(NCS)]PF₆. Equilibrium and rate constants for the inter-conversion between the linkage isomers were measured by ¹H-NMR spectroscopy at 50°C. In d₆-acetone solution, K_{Ru-S→Ru-N} = 0.74(4) while in CD₃OD solution K_{Ru-S→Ru-N} = 0.31(2). In d₆-acetone k_{Ru-S→Ru-N} = 1.1(1) × 10⁻⁶ s⁻¹ and k_{Ru-N→Ru-S} = 1.4(1) × 10⁻⁶ s⁻¹. In CD₃OD, k_{Ru-S→Ru-N} = 1.5(1) × 10⁻⁴ s⁻¹ and k_{Ru-N→Ru-S} = 4.9(4) × 10⁻⁴ s⁻¹.

THE BASIN OF ATTRACTION FOR THE DRUVE MODEL

Robin Augustine Thottungal (Electrical & Computer Engineering, undergraduate)

Faculty Mentor: Natalie Cartwright (Dept of Mathematics)

In physical problems, the computation of an inverse Fourier transform oftentimes does not have a closed solution. Other methods, such as asymptotic expansions, are available to find approximations to the inverse transform. These methods require the locations of the saddle points of the exponential function that appears in the inverse transform (called the complex phase function). The saddle points of the complex phase function are the zeros, or roots, of its first derivative. The Newton Rapson method is a numerical method for finding the roots of a function. The ability of this numerical method to find a root depends on the initial guess as to the location of the root. Based upon the initial guess, Newton's method will either converge to a root or diverge. This study color maps the complex plane based on the ability of the Newton-Rapson method to find the saddle points of the complex phase function for the Drude model from that initial value; that is, we plot the basin of attraction. MATLAB was used for the numerical simulation. The results show that there are three saddle points and the convergence is highly dependent upon the initial condition. In addition, the basin of attraction forms a fractal.

BIOSURFACTANT PRODUCTION BY P. PUTIDA

Kerri Degroat (Environmental Geochemical Science, undergraduate)

Faculty Mentor: Megan Ferguson (Chemistry)

Pseudomonas putida aerobically degrades a variety of soil and groundwater contaminants, including polycyclic aromatic hydrocarbons (PAHs) such as anthracene, phenanthrene, acenaphthylene, fluoranthene, and pyrene. Biosurfactants produced by *P. putida* are believed to enhance the bioavailability of PAHs. Most previous work with biosurfactants has focused on compounds secreted by the cell into solution, but here we focus on cell membrane-bound biosurfactants. *P. putida* cells were grown in minimal media supplemented either by anthracene or glucose, and membrane-bound compounds were extracted with acetone. This crude extract demonstrated an ability to modify surface tension using the water drop method. Further information on compounds present in the crude extract was obtained by direct exposure probe mass spectrometry.

PROCESSES OF INTER-RELIANCE

Janet Hirsch (Foreign Languages, undergraduate)

Faculty Mentor: Ligia Aldana (Foreign Languages)

This study focuses on the role of women in Santería-Lucumí, an Afro-Cuban religion. Analysis of the mythology, cosmology, and history of Santería-Lucumí is used to determine what culturally prescribed roles women play in the religious community. Works by key authors are examined including Mary Ann Clark, David Brown, Lydia Cabrera, and William Ramos. Analysis focuses on the portrayal of women in patakines, the participation of women in the highest culturally recognized rituals, the historic participation of women in religious society, the role of women in the Cuban Revolution, and the effects of the Cuban Revolution on women's role in society. Analysis indicates that men and women participate in Santería-Lucumí religious society based on processes/positions of inter-reliance. The ceremonies and mythology of Santería-Lucumí reflect a discourse based on the primacy of reproduction. The cooperation between opposite gendered individuals is stressed as necessary for the successful reproduction of the Orisha and thus the religion. Women have an integral role in the perpetuation and reformation of Lucumí practices through leadership and non-leadership positions. Women (and men) can participate in the religion in various ceremonial capacities whose success is inter-reliant on the participation of a man (or woman). In this way there is an established system, which prevents the consolidation of power within one sex.

MID-DEVONIAN FAUNAL TURNOVER IN EASTERN AMERICA

Thomas Schramm (Geology, undergraduate)

Faculty Mentor: Alex Bartholomew (Geology)

The general timing of faunal turnover of ecological-evolutionary sub-units (EESUs) within the Middle Devonian Appalachian Basin is relatively well constrained. However the precise onset of major turnover events is still under investigation. The first appearance of distinct faunal elements of each of the EESUs is locally controlled by facies. Although, distinct faunal associations may transcend facies, barren or very sparsely fossiliferous facies provide no data. A major faunal turnover in the Middle Devonian of eastern North America occurs between the Stony Hollow-Rogers City Fauna and the Hamilton-Traverse Fauna. This large-scale turnover has been shown to occur across most of ENA in both the Appalachian and Michigan basins, during the latest Eifelian. The first appearance of the Hamilton Fauna has long been identified as occurring in the Halihan Hill Bed of the Oatka Creek Formation, which lies above the East Berne Member (EBM) shale interval. Recent attention has focused on investigating the precise timing of this turnover in the stratigraphically expanded interval of the EBM. Lying between the top of the Cherry Valley Mbr. and the Halihan Hill Bed in eastern New York State, the EBM is composed primarily of dark-gray to gray shale with thin siltstones and sandstones near the top, interpreted to represent the highstand and falling-stage systems tracts of the lowest 4th-order stratigraphic sequence of the Oatka Creek Formation.

BIOFACIES ANALYSIS IN THE MIDDLE DEVONIAN OF NY

Jaelyn Martin (Geology, undergraduate)

Faculty Mentor: Alex Bartholomew (Geology)

Recent investigations of biofacies within the Middle Devonian of eastern North America have focused primarily on the recurrence of biofacies through time. The issue of biofacies response to sea level fluctuations has been analyzed to a large extent in vertical stratigraphic successions; the matter is complicated by the interplay of controls such as sediment input and water depth on the formation of biofacies. In order to disentangle the effect of these two dominant factors, it is necessary to examine biofacies changes along a single time-parallel gradient, where one of these factors can be assumed to be nearly constant. One such possibility would be a gradient that runs parallel to the direction of incoming sediment supply and perpendicular to depositional shoreline strike, where water depth is known to change. Such a gradient would factor out the control of sediment supply upon the distribution of biofacies along the gradient. Just such a case exists in the Middle Devonian of the Appalachian Basin in the coral beds of the Otisco Member of the Ludlowville Formation of central New York State. Exposures of the Staghorn Point submember along the shores and tributaries of Skaneateles Lake run roughly perpendicular to the main gradient of sediment supply in the basin and display a deepening trend to the northwest making this an excellent bed in which to test these hypotheses.

BROOKS ORGANIC FARM SOIL ANALYSIS

Ara Krom, Kerri DeGroat Kristine Garbarino (Geology, undergraduate)

Faculty Mentor: Shafiul Chowdhury (Geology)

Abstract Brook Farm is an organic farm located in New Paltz New York. Samples were obtained on October 31, 2007 from an area that had been used for the cultivation of tomatoes. A hole was dug and samples from the Ap layer and B horizon were assessed for pH, permeability, porosity, nitrate, phosphate, humus and ammonia. The values for the Ap layer were: pH of 6, porosity was 26.22%, nitrate was 10-20 pounds per acre, phosphate was 50 pounds per acre, the humus was medium or about 20-28% and the ammonia content was very low. The B horizon had a pH of 6, porosity of 25.03%, nitrate of 10 pounds per acre, phosphate of 10-25 pounds per acre, the humus was low or about 10-14% and ammonia content was very very low. These values were used to evaluate the relative ease with which a crop could grow. Identifying soil porosity, permeability (conductivity), texture and chemistry is important to determine what the land use may be suitable or if the land is being used for farming, what could grow there. Also determining the chemical constituents already present in the soil is helpful in determining how much fertilizer may be needed for optimal growth of certain plants. The porosity and texture indicates a good internal drainage for mixed soils. The pH, nitrate and phosphate are adequate for plant growth in this area. The ammonia content is low but, overall the soil was determined to be sufficient for farming uses.

HYDROGEOCHEMICAL ANALYSIS OF PRIVATE WELLS

Christina Hartwell, Jennifer Geller, Maureen O'Connell (Geology, undergraduate)

Faculty Mentor: Shafiul Chowdhury (Geology)

Hydrogeochemical Analysis of Private Wells in the Mid Hudson Valley Region A hydrogeochemical analysis of groundwater well samples obtained from fifteen private wells from three different counties in eastern New York State was conducted. Fifteen samples were collected from Ulster, Dutchess, Rockland and Orange counties. The following tests were conducted: pH, Dissolved Oxygen, conductivity, alkalinity, nitrate, phosphate, chloride, ammonia, calcium, magnesium, sodium and potassium. Significant findings were that of higher than normal concentrations of sodium, chloride and nitrates. It was found that the highest amounts of these solutes found in the water samples which were caused by runoff containing fertilizers and the natural dissolution of minerals. Results were then compiled and it was found that all wells but one fell into the standard allowable drinking water regulations. One well near Accord, NY in Ulster County had a few measurements, which are above the USEPA's maximum contamination level (MCL) and not recommended for drinking.

EFFECT OF POST-CONFLICT RECONCILIATION ON PEACE

Amanda Garlin (International Relations/Political Science, undergraduate)

Faculty Mentor: Kathleen Dowley (Political Science)

Reconstructing the Future: The Effect of Post-Conflict Reconciliation on the Duration of Peace. The positive psychological and social effects of reconciliation suggest that implementing such mechanisms after a civil conflict will prolong peace. Post-conflict reconciliation includes two categories of justice - retributive and restorative - which are different ways of approaching past atrocities. This study analyzes the effect that retributive (trials, exiles) and restorative (amnesties, truth commissions, reparations) reconciliation mechanisms have on peace duration while variables controlling for the literature also affect peace duration. Data analysis finds that reconciliation significantly and positively affects peace duration. The case study of Argentina strongly supports this finding while the case study of Chad suggests avenues for future research.

UNDERSTANDING (UNDER)DEVELOPMENT

Amanda Cheney (International Relations, undergraduate)

Faculty Mentor: Kathleen Dowley (International Relations)

Liberalism on the international level constrains the pursuit of power and revokes the utility of war in state-building. With contemporary enduring statehood no longer dependent upon effective war-making, weak, underdeveloped countries are the result of a benign environment which insulates states from the necessity of a social contract. To determine how liberalism imposes decadent values' preferences for self weakness on late developing countries I analyze the effects of the changing nature power in international politics on the formation of a state's identity and subsequent behavior. I assess the cohesion of identity and behavior with a qualitative indicator of legitimate identity and quantitative indicators of developmental strength in 177 countries. I also conduct case studies of Zimbabwe, Burundi, Singapore and Malaysia to illustrate the causal mechanisms linking identity and state development. Ultimately, the legitimacy of a state, its domestic capacity for effective governance, is a significant determinant of its likeliness to develop strongly.

RECOVERING MINUTE BIOGENIC ELECTRIC FIELDS

Ryan Vinson, n/a (physics, undergraduate)

Faculty Mentor: Richard Halpern, Spencer Mass, (physics; biology)

It has been known for some time that small steady state ionic D.C. currents occur at wound sites of organisms. These currents apparently play a large role in the healing process but, as of yet, the reason has not been ascertained. The biology department investigates wound healing and regeneration processes in a small flatworm (planaria). It was not known whether such small invertebrates would produce such signals. If so, given the simplicity of the planaria, it should be possible to investigate the phenomenon in much finer detail and perhaps get to the core function of the steady-state currents. The first stage of the project required that a device be made that can measure small voltages (in the estimated microvolt to nanovolt range) in the presence of much larger noise. This was accomplished by vibrating a probe at a known reference frequency to simulate the D.C. voltage as an A.C. voltage. It was then analyzed with the use of a lock-in amplifier. Our initial results show that planaria do indeed produce a D.C. signal at a wound site in the low (~10) microvolt range. Currently the project is attempting to immobilize the worms in order to gain more accurate readings. Plots are presently being taken to understand how the signal changes over time during the entire healing process.

ALL THE PRESIDENT'S NERDS: UNLEARNED LESSONS

Justin Holmes (Political Science, undergraduate)

Faculty Mentor: Nancy Kassop (Political Science)

This study examines whether or not the current legal framework and current actual practices of Presidential record creation and retention demonstrate awareness of the problematic history of data security in the White House, beginning with the first use of email during the Reagan Administration. While the available literature is already awash in strictly legal analyses of arguments made by the various legal and political actors, this study aims to break new ground by critically examining technical details put forth by White House IT staff and the legal reasoning which sometimes implicitly underlies them. Specifically, this study is concerned with instances of loss or destruction of certain electronic records protected by the Presidential Records Act which are explained by the White House IT staff as technological quandaries, but whose technically faulty underpinnings reveal political motives and / or conduct which is contrary to the applicable legal framework. The resulting paper and multimedia presentation aim to be informative, exciting, and amusing to both legal and technological scholars. Sources include legal statutes, court cases, books, Congressional hearings, interviews with representatives of companies that create software used in the White House, and interviews with individuals involved in record retention.

NONVERBAL BEHAVIOR AND THE INTERVIEWING PROCESS

Leigh Rokitowski, Kristin Markgraf, Brittany Pfeifer, Jessica Ocheret (Psychology, undergraduate)

Faculty Mentor: Douglas Maynard (Psychology)

The purpose of this research is to determine the effect nonverbal behavior of a job applicant during an interview has upon the behavior and judgments of the interviewer. Also under investigation is whether the interviewer's sensitivity to nonverbal behavior might influence this relationship. There are 3 major hypotheses in this study. First, it has been hypothesized that as compared to positive introductory nonverbals (a firm handshake with good eye contact), negative introductory nonverbals (a weak handshake with poor eye contact) on the part of the applicant will cause the interviewer to end the interview sooner, judge the applicant less favorably and be less likely to express interest in hiring the applicant. Second, positive nonverbals will be positively associated with interviewer ratings of the applicant's extraversion and openness, and negatively associated with the interviewer ratings of the applicant's neuroticism. Finally, interviewer nonverbal sensitivity will moderate these relationships, such that the effects described above will be stronger for interviewers who are more sensitive to nonverbal behavior. Data is collected through a mock interview scenario, in which the participant takes the role of an interviewer, and a confederate takes the role of an interviewee. Data analyses have drawn insignificant conclusions, leading to the need for several improvements to be made in order for research to continue.

MOTHER BELIEFS ON PARENTING AND ADOLESCENCE

Heather Mangione (Psychology, graduate)

Faculty Mentor: Tabitha Holmes (Psychology)

Fifty-four mothers (M_{age} = 44.5) of adolescents from diverse backgrounds in the U.S. participated in this study about parent goals for their adolescents and how parents teach them. Mothers described goals and responded to six hypothetical scenarios by describing parental teaching strategies. Using an inductive analysis mothers were coded as having a self-sufficiency or self-actualization goal orientation. Mother responses to the hypothetical scenarios were coded on an ordinal scale (1-4) reflecting how much the response required adolescents to think actively and process information independently. Preliminary findings revealed that mothers with self-actualization goals endorsed strategies that were more cognitively demanding than mothers with self-sufficiency goals, suggesting that parents who emphasize independence may limit teenager opportunities to solve problems independently.

INTERVIEW BEHAVIOR

Rachel Moreau, Leigh Rokitowski, Nadia Fadonougbo, and Anna Lange

(Psychology, undergraduate)

Faculty Mentor: Dough Maynard (Psychology)

The purpose of this project was to determine the potential effect of two variables - applicant résumé strength and perceived accountability - on the behavior and decision making of the interviewer. Research has demonstrated the importance of early interviewer impressions of an interviewee on subsequent interviewer behavior. The current study represents the potential effects of pre-interview information and accountability upon interviewer's behavior and decision. We predicted that interviewers provided with positive applicant information will ask fewer questions, and interviewers who are accountable will ask more questions, take more interview notes, and hold the interview longer. Thirty-five undergraduate students at a small public university volunteered to participate in this study. Participants were told that they would be acting as an interviewer for the position of resident assistant (RA) that they would be interviewing a single applicant and then making a decision about whether to hire her. Half of the participants also were told that they would have to justify their hiring decision.

After conducting the interview, participants rated the applicant on various skills and decided whether to hire her or not. Résumé strength had no effect upon either the number of questions asked by the interviewer or judgments of applicant performance during the interview. Participants in the accountability condition asked more questions, took more extensive notes.

GENDER ROLE EXPECTATIONS AND LEADERSHIP

Sean Brown, Nicholas Johnson (Psychology, undergraduate)

Faculty Mentor: Maryalice Citera (Psychology)

A case study examined whether women face greater scrutiny based on gender role expectations than men when competing for high profile leadership positions, specifically during a United States presidential campaign. The study examined whether gender role expectations influenced the media coverage of the three candidates vying for the 2008 Democratic nomination (Barack Obama, Hillary Clinton, John Edwards). Fifty newspaper articles randomly selected from the ABI/INFORM Global Advanced Search database from December 1, 2007 and January 31, 2008 will be critically coded using the NVivo coding software. The articles will be coded for positive and negative gender stereotypes of power (Diekman, Goodfriend, & Goodwin, 2004). We predict that political candidates will be judged not only on their credentials for the position but also on expectations regarding how members of their gender should act. Individuals who act in gender role consistent ways should be viewed more favorably than those who act in gender role inconsistent ways.

WORD SUPERIORITY EFFECT IN BILINGUALS

Joseph DiPietro (Psychology, undergraduate)

Faculty Mentor: Giordana Grossi (Psychology)

In previous studies, Italian-English bilinguals had shown a clear advantage in identifying letters in real words (ex. Tape) versus pseudowords (ex. Lape). This effect is known as the word superiority effect (WSE) and indicates the familiarity that a speaker has with the words of his/her own language. In a more recent study, Welsh-English bilinguals did not show a WSE for either language. Because a different apparatus was used to measure the WSE for the Welsh-English bilinguals (laptop instead of desktop computer), the current study was conducted to assure that the difference in results for these two groups of bilinguals was due to a difference in orthographic processing, and not to the apparatus used. Participants included 18 native English monolinguals of both sexes (mean age = 33, range:19-61). It was predicted that, if the laptop had no effect on performance, these participants would show a clear WSE for English stimuli, but no WSE for Welsh stimuli. The results confirmed this prediction. Therefore, the difference in orthographic processing between Italian-English bilinguals and Welsh-English bilinguals is a real effect, and may be due to such factors as age of acquisition (early vs. late bilingualism) or difference in bilingual education (simultaneous vs. separate).

ATHLETES SUPPORT FOR SOCIAL ISSUES

Jenna Weinstein (Psychology, undergraduate)

Faculty Mentor: Peter Kaufman (Sociology)

This study examines the opinion of 118 student athletes [males (n=46) and females (n=81)] regarding their willingness to support three social issues: anti-discrimination, workers' rights, and environmental protection. All participants were given one of three surveys which contained information outlining the basics of each issue and how it could possibly affect athletes. They were then asked to indicate whether or not they agreed with the statement and their reasons why or why not. Participants who agreed with the statements (n=102) tended to base their support on one of two orientations: an individual perspective or a holistic perspective. Students who disagreed (n=16) generally expressed having no personal connection with the issue or believed that the statements being made were false or not relevant to athletics. This finding occurred primarily with participants who were given the topic on environmental protection. The study reveals that most participants were willing to support a serious issue if they felt that they or a large number of others would be directly affected.

RESTORATIVE JUSTICE AND INTIMATE PARTNER VIOLENCE

LeAnn Heathwood (Sociology, undergraduate)

Faculty Mentor: Eve Waltermaurer (Sociology)

The purpose of this study is to identify areas that are actively using restorative justice (RJ) as an alternative to punishment for intimate partner violence (IPV). Briefly, restorative justice is a process that restores relationships between victims, offenders and the community by using innovative ways in order for these parties to become more involved in decisions made about a particular case. In regards to the application of RJ for IPV, there have been some positives and negatives discussed in the literature. This qualitative study entailed in-depth interviews with the five agencies in the United States identified as actively using RJ for IPV. Interviews included question about victim/offender satisfaction, safety and overall program goals. Overall it was found that both victims and offenders claimed to be satisfied with the use of RJ for IPV. Also, most of the agencies emphasized the importance of recognizing safety issues when using RJ for IPV. The use of RJ for IPV is not commonly used in The United States but has the potential to be very affective when dealing with IPV cases.

COSTUME DESIGNING FOR THE PROMISE KEEPER

Mary Hunt (Theatre Arts, undergraduate)

Faculty Mentor: Andrea Varga (Theatre Arts)

The SUNY New Paltz production of Dias Gomez' *The Promise Keeper* marked its American premiere. As such, a careful study of Brazilian language, street politics, customs, and ethnic dress were essential to creating a theatrical atmosphere that was both translatable to an American audience and true to its Latin American roots. The production sought to demonstrate the contrast between rural and urban living, the effect of media and propaganda on society, and the force of police and religion that dominate the small Brazilian town of Bahia. Costumes were crucial to *The Promise Keeper*, because the majority of other technical elements were rooted in minimalism. The use of color, fabric weight and texture, and silhouette were used to tell each character's individual story and to place them within the world of Bahia. Initial research was gathered from literary sources about climate, social demographics, and cultural customs of the region. Visual references of architecture, artwork, festivals, and pop culture were also studied and compiled. This proved crucial later on in the design process to communicate specific ideas and character traits. Upon presenting research to the production team of *The Promise Keeper*, costume design renderings were created. These illustrations communicated specific characteristics of the individuals in the story. Additionally, fabrics were chosen that fit within both the aesthetics of the production and were cohesive with previous research.

2007 SURE Award Recipients

(faculty mentors and departments are provided in parentheses)

- Corinne Szewcy** (2008), “A thermodynamic study of the effects of LNA in DNA hairpins” (Pamela St. John, Chemistry)
- Kerri DeGroat** (2008), “Evaluation Of The Health Of Lower Esopus Creek Using Benthic Macro Invertebrates” (Shafiul H. Chowdhury, Geological Sciences)
- Igor Gembitsky**, “Study of melanogenesis stimulation by *Psoralea corylifolia* and *Heracleum maximum* plant extracts and their coumarin constituents in murine B16 melanoma cells” (Preeti Dhar, Chemistry and Maureen Morrow, Biology)
- Rodica Buzu**, “The Effect of Interviewer Expectations and Cognitive Style Upon Confirmatory Behavior and Judgments During the Interview” (Douglas C. Maynard, Psychology)
- Rana Balesh**, “Women’s Experiences of Objectification” (Melanie S. Hill, Psychology)
- Annet Nakamya**, “Women’s military roles in national liberation wars and internal conflicts in Africa: implications for political empowerment” (Eudora Chikwendu, Political Science)
- James W. Smith**, “Relationship Between Political Party Systems and Mass Movement Participation” (Igü Özler, Political Science)
- Regina Klein**, “The effects of nutrition on sleep patterns in *Drosophila melanogaster*” (Aaron Haselton, Biology)
- Nicole Vitillo**, “Crystallization of HUG1” (Jennifer Waldo, Biology)

Fall 2007 AYURE Award Recipients

- LeAnn Heathwood** (’08) Survey of Innovative Justice Responses to Domestic Violence in the United States (Eve Waltermaurer, Sociology)
- Corinna Chaize** The cross-sex mind-reading component of mating intelligence (Glenn Geher, Psychology)
- Matthew J. Restivo** Reading the Audience: Transformations of Nineteenth-Century American National Identity (Reynolds J. Scott-Childress, History)
- Jaclyn Martin** (’09) Paleoecology Of The Middle Devonian (Givetian) Stag Horn Point Coral Bed (Alexander Bartholomew, Geology)
- Thomas Schramm** (’09) Karst Groundwater Hydrology Of The Pompey’s Cave Area (Alexander Bartholomew, Geology)
- Leigh Rokitowski** (’08) Effects of Interviewee Nonverbal Behavior on Interviewer Perceptions and Decisions (Douglas C. Maynard, Psychology)
- Cynthia Colon** (’08) Synthesis and antimicrobial activity of skeletally modified α -pinene derivatives (Preeti Dhar, Chemistry)
- Matt Zubrowski** (’08) DASH complex in *Candida* (Jennifer Waldo, Biology)
- Arsalan Aslam** (’10) Production of a thermostable enzyme (Maureen Morrow, Biology)
- Colin Mills** Land-use and the Impact on Water Quality in Wallkill River, Ulster County, New York (Shafiul H. Chowdhury, Geology)

Spring 2008 AYURE Award Recipients

- Mary C. Hunt** ('08) Costume Design for The Promise Keeper by Dias Gomez, (Andrea Varga, Theater Arts)
- Heather Slivko-Bathurst** ('10) Bioarchaeological Investigations at Cola de Zorro, southern Peru, (Kenneth C. Nystrom, Anthropology)
- Matt Zubrowski** ('08) Analysis of the Candida albicans DASH complex, (Jennifer Waldo, Biology)
- Leigh Rokitowskim** ('08) Effects of Interviewee Nonverbal Behavior on Interviewer Perceptions and Decisions, (Douglas C. Maynard, Psychology)
- Risa Alfieri** ('09) Hooking-up behavior among college students: Experiences and expectations, (Melanie S. Hill, Psychology)
- Igor Gembitsky** ('08) Effects of Psoralea corylifolia and Heracleum maximum extracts on the tyrosinase activity of cultured murine B16 melanoma cells, (Preeti Dhar/ Maureen Morrow, Chemistry/Biology)
- Christopher Gahn** ('09) Taphonomy of Chambered Cephalopod Shells: comparing the preservation of Lower Devonian goniatites from Morocco with experimentally "fossilized" Nautilus pompilius shells, (Alexander Bartholomew, Geology)
- Ryan Vinson** ('09) Measurement of Electromagnetic Fields in Regenerating Planaria , (Spencer Mass / Richard Halpern, Biology / Physics)
- Flannery Spring-Robinson** ('09) The 2007 US Social Forum: New Vocabularies of Social Justice, (Benjamin Junge, Anthropology)
- Kerri Degroat** ('08) Effects of polycyclic aromatic hydrocarbons on biosurfactant production by Pseudomonas putida, (Megan Ferguson, Chemistry)
- Aaron Leo** ('09) Function of Romantic Love for Married and Divorced Adults, (Victor de Munck, Anthropology)

Student Travel Award Recipients

- Cynthia Colon** (Mentor: Preeti Dhar, Chemistry) Spring 2008 American Chemical Society National Meeting, New Orleans, LA
- Igor Gembitsky** (Mentors: Preeti Dhar, Chemistry) and Maureen Morrow, Biology) Spring 2008 American Chemical Society National Meeting, New Orleans, LA
- Colin Mills** (Mentor: Shafiq Chowdhury, Geology) 2008 Geological Society of America Annual Conference, Denver, CO
- Thomas Schramm** (mentor: Alex Bartholomew, Geology) 2008 Geological Society of America Annual Conference, Denver, CO
*****awarded second place for Best Student Presentation on the topic of Paleontology.
- Liza Valdivia** (Mentor: Dan Freedman, Chemistry) Fall 2007 2008 American Chemical Society National Meeting,, Boston MA
- Darren Ceckanowicz** (Mentor: Pamela St. John, Chemistry) Fall 2007 American Chemical Society National Meeting,, Boston MA
- Corinne Szewcyk** (Mentor: Pamela St. John, Chemistry) Fall 2007 American Chemical Society National Meeting,, Boston MA
- Igor Gembitsky Jackie Martin, and Tom Schramm** presented posters at the 2008 National Conference on Undergraduate Research at Salisbury University in Maryland

(www.salisbury.edu/ncur22). Approximately 2,800 students and faculty mentors attended the conference where students from over 350 colleges and universities presented research representing over 50 disciplines. The students commented that they enjoyed learning about the methodology and results of research in different disciplines. They also benefited from the process of discussing their own research with the individual who visited their poster.



Pictured: Tom Schramm, Igor Gembitsky, and Jackie Martin
(photo by M. Morrow)

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