

ABSTRACTS ALPHABETIZED BY PRESENTER

THE BLACK PLAGUE AND ITS EFFECT ON THE MEDIEVAL MIND

Ranya Abi-Falah, Bioinformatics

Faye Prichard, University College, Faculty Mentor

Between the fourteenth and eighteenth centuries, Europe was hit by devastating outbreaks of the Black Plague, which resulted in the decimation of one third the population of Europe. This research paper, investigates the various assumptions of the plague and what they reveal about the medieval mind in sixteenth and seventeenth century England. The main outbreaks of the plague that claimed the most lives were during the sixteenth and seventeenth centuries and it was during these times that both Renaissance and the Reformation were in full swing. The Renaissance in England revolutionized man's way of thought and the Reformation divided England in terms of two parties: Catholicism and Protestantism. As such, the medieval mind coupled with the random outbreaks of the Black Plague, resulted in a need for people to find a reason as to why those nearest to them were perishing from this disease so mercilessly. With religion being a major factor in English society, people looked for behavior which would justify divine wrath and retribution, particularly in the instances where science held no viable answer. With the increase of religion, the role of magic and astronomy in society declined, but did not totally disappear. Astrologists maintained that the stars and planets could foretell and explain occurrences and disasters, such as the outbreak of the plague. This is exploratory research that looks through the lives of those living through the Black Plague in England and study how the average person dealt with such a natural disaster and tried to make sense of it.

ESTABLISHING AN ELECTROSPUN MATRIX MICROENVIRONMENT FOR MODELING BREAST CANCER BIOLOGY

M. Jeannette Aiken, Forensic Science

Michael P. Francis and Lynne W. Elmore, Department of Pathology and Gary L. Bowlin, Department of Biomedical Engineering

Maintaining or disrupting homeostasis in the breast involves the interactions of many cell types with one another and with the microenvironment, contributing to the deterrence or development of cancer. Realizing the complexities this creates in a research situation, an investigation began for designing a novel 3-D model system to imitate the functional components of *in vivo* breast tissue with human mammary stromal-epithelial co-cultures in an electrospun extra-cellular matrix. The potential of growing cultures in an electrospun scaffold was explored because it gives the researcher control over the fiber size, scaffold density, the size and makeup of the scaffold proteins and the component ratios of the matrix. The characterization of both stromal and epithelial mammary isogenic cell lines were required for establishing the co-cultures on various matrices. Through viral transfections, infections and drug selection parental stromal cells were immortalized to express human telomerase reverse transcriptase and MCF-10A cells were tagged with green fluorescent protein to distinguish the cell types in co-culture and visualize ductular formations. After establishing stable cultures, experiments with collagen and fibrinogen matrices and varying seeding densities began to construct the most effective *in vivo*-like microenvironment. Cultures of MCF-10A cells were seeded onto electrospun fibrinogen 200-500 microns thick and remained viable, but after a week of growth they barely penetrated the matrix even when pore size was increased. This preliminary data shows promise for the viability of cultures on electrospun matrixes and indicates the need to investigate other methods, perhaps electrospaying, for integrating the cellular cultures into the scaffold.

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HYDRATED PEPTIDE NANOCALORIMETERY: DETERMINING THE EFFECTS OF SOLVENT ON BIOMOLECULAR REACTIVITY

M. Jeannette Aiken, Forensic Science

Ryan D. Leib, William A. Donald, and Evan R. Williams, Faculty Mentors

Department of Chemistry, University of California, Berkeley 2008 Amgen Scholars Summer Research Program

Fourier transform ion cyclotron resonance mass spectrometry (FT/ICR-MS) has been established as a primary tool of biochemical analysis due to its rapid detection of functional groups, high mass accuracy, and high resolution. Electron capture dissociation (ECD), a recently introduced mass spectrometry technique, has found particular utility in the field of proteomics for the sequencing of proteins. ECD experiments are conducted by trapping gas phase ions with electric and magnetic fields and introducing low-energy thermally generated electrons to interact with the trapped ions. The resulting odd-electron ions release energy, forming the unique fragments detected for identification. While the efficacy of this approach is irrefutable, the mechanics are highly disputed. A novel approach to investigating ECD is the use of hydrated ions as nanocalorimeters, in which the total energy deposited by the electron is measured from the number of water molecules released upon electron capture. By mimicking solution-phase conditions with the enveloping water, the results obtained here will form a basis of comparison between gas and solution ion-electron interactions. Using "thermometer" ions of solvated protein analogs, such as diaminoalkanes or peptides, their energetics and interactions can be determined both intramolecularly and intermolecularly with the surrounding water. Describing the energetics of these ECD reactions goes beyond comprehending the mechanism towards better understanding of the solvation nature of proteins.

THE EFFECT OF RING SIZE ON GAS-PHASE SUBSTITUTION AND ELIMINATION REACTIONS

Andrew Alexander, Chemistry

Scott Gronert, Chemistry, Faculty Mentor

Funding provided by a grant through the National Science Foundation

Gas-phase studies of reaction processes offer a unique opportunity to study reaction mechanisms in the absence of solvation effects. This is particularly useful in ionic reactions where strong solvation, hydrogen bonding, and ion pairing can greatly alter the course of the reaction and the nature of the product distribution. Over the past several years, the Gronert group has used a novel ionic platform approach to study the rates and product mixtures of the gas-phase reactions of nucleophiles with alkyl halides and related substrates (Scheme 1). In this approach, a dianion nucleophile is used such that one of the ionic sites is reactive and the other (sulfonate) is inert under the reaction conditions. In this way, the ionic products indicate the mechanism (S_N2 or E2) and can be detected by mass spectrometry. It is true that the neutral products also indicate the mechanism, but there is no practical way to identify them in gas-phase experiments. In this study, the effect of ring size on the competition between substitution and elimination has been explored. Rates have been measured and branching ratios determined. The reactions of dianions with cyclobutyl, cyclopentyl, cyclohexyl, cycloheptyl, and cyclopropylmethyl bromide have been studied. Ring size has a large effect on the product distributions and in some cases, a reaction path is completely suppressed. For example, cyclohexyl bromide gives only elimination products.

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FINANCIAL TURMOIL IN WORLD ECONOMY

Kanwar Anand, Financial Technology
Carol Lehr, Economics, Faculty Mentor

Financial turmoil has been haunting the United States for over a year now. It started when the housing bubble busted a year ago. The bursting of the housing bubble showed the shortcomings of the subprime mortgage markets and how they were being regulated. The housing market slowdown was not the only reason behind the current economic slowdown. In the early 2000's the world savings considerably increased compared to the 1990's. For example, there was a large availability of credit in world markets. This availability of credit led to increased borrowings and financial institutions did not consider the risk involved. Consequently, lenders started distributing credit to borrowers as they saw fit. The loans were highly leveraged. The financial institutions made financial securities and instruments that failed when the economy was under financial pressure. Because of the risk and the threat of losing the money, lenders stopped giving out loans and this led to tightening of credit in world economies. Realizing that the financial turmoil was not a national problem but an international problem, the United States has begun to coordinate with other central banks around the world. On October 10-11, 2008, the representatives of the G-7 countries met in the U.S. to figure out how the financial slowdown can be avoided. They discussed actions that need to be taken to restore confidence and stability in the economy. They agreed to use all financial tools that are available to avoid any possible insolvency and bankruptcy in banks all over the world. This analysis will explore how central banks are coordinating and attempting to restore confidence in the credit markets. This analysis will also explore why the central banks are now using core CPI over headline CPI to stabilize the economic situation and why inflation expectation targeting is so important for restoring stability.

DESIGN AND SYNTHESIS OF ANIBAMINE-BASED MACROPHAGE CCR5-ANTAGONISTS FOR HIV-1 FUSION INHIBITION

John Ernest Vallarta Bajacan, Guo Li, Kendra May Haney, Yan Zhang, Chemistry
Yan Zhang, Medicinal Chemistry, Faculty Mentor
Funding provided by a grant through the U.S. Army Prostate Cancer Research Program PC073739, NIH/NIAID AI69975 and AI074461 and the Honors Summer Undergraduate Research Program

The global dispersion of HIV-1, the primary causative agent of the AIDS pandemic, may be attributed to the rapid mutation and high development of drug resistance. Thus, the need is rising for more potent antiretroviral drugs with novel modes of action in targeting critical and more conserved HIV-1 activities. Recent findings have confirmed the role of CCR5 as the critical co-receptor for the viral envelope protein gp120 during macrophage-tropic phase HIV-1 fusogenesis. The natural product anibamine was shown to effectively bind to CCR5 (IC₅₀=1.0uM) in a [¹²⁵I]-gp120 competitive binding assay. Anibamine was also found to block HIV-1 invasion (EC₅₀=0.6uM) in an HIV-1[BAL] inhibition assay. Completion of the total synthesis of anibamine permits the materialization of derivatives to analyze its structure-activity relationship (SAR). Two series of analogs have been designed and chemical synthesis is in progress. Characterization of final compounds will be accomplished by NMR, IR, MS, and elemental analysis. Evaluation of the CCR5 binding affinity of these final compounds will include [¹²⁵I]-gp120 competitive binding assay. Promising compounds (binding assay IC₅₀ < 0.10uM) will be evaluated on HIV-1 entry inhibition assays, including competition with HIV-1[BaL] on GHOST R5 cells. The SAR analysis may identify a novel lead compound for future anti-HIV-1 agent development.

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RELATIONSHIPS AMONG SERUM LEPTIN, BODY WEIGHT STATUS, AND CARDIORESPIRATORY FITNESS IN OBESE AFRICAN AMERICAN FEMALE ADOLESCENTS ENROLLED IN A WEIGHT MANAGEMENT PROGRAM

Blackwell, WM, Herrick, JE, Franco, RL, Lipford, GF, Wickham, EP, Evans, RK; Health, Physical Education, & Exercise Science

Ronald K. Evans, Health & Human Performance; Jeffrey E. Herrick, Internal Medicine, Faculty Mentors

Funding provided by a grant through the Virginia Premier Health Plan, the American Heart Association, Ronald McDonald Charities, and the VCU General Clinical Research Center (NIH 5M01RR000065)

Leptin, an adipose-derived hormone, is positively correlated to adiposity in humans, and hyperleptinemia has been implicated in several obesity-related comorbidities. Reduced leptin resulting from weight loss has been correlated to initial leptin concentration and changes in fat mass. The purpose of this study was to examine the relationships among leptin, body weight status, and cardiorespiratory fitness (CRF) before and after 6 months of participation in a weight management program. Thirty-six obese African American female adolescents (13.4 ± 1.6 yrs; 36.4 ± 5.4 kg/m²) were enrolled in the intervention, which included physical activity, nutrition education, and behavioral support. Baseline leptin was positively correlated ($p < 0.05$) with body mass, body fat percentage (%BF), BMI, and BMI z-score (BMIz) and negatively correlated with CRF. Twenty-six participants (72%) completed 6 months and had reductions in leptin (PRE 70.0 ± 19.3 ng/ml, POST 50.4 ± 19.2 ng/ml, $p < 0.01$), %BF (PRE $51.9 \pm 5.0\%$, POST $50.5 \pm 5.8\%$, $p < 0.01$), and BMIz (PRE 2.43 ± 0.27 , POST 2.36 ± 0.29 , $p < 0.01$). CRF was not significantly increased ($p = 0.116$). Changes in leptin were correlated with reductions in BMI ($r = -0.521$, $p < 0.05$) and BMIz ($r = -0.493$, $p < 0.05$) but not with initial leptin concentration, changes in %BF, or CRF. These findings indicate that a weight management program can contribute to reductions in leptin independent of changes in CRF. Reducing leptin in obese adolescents may attenuate the progression toward obesity-related comorbidities in adulthood.

ELECTORAL REFORM: WHAT WE NEED, AND WHY WE NEED IT

Sam Bosch, Political Science

Bonnie Orzolek, University College, Faculty Mentor

When we conceptualize the idea of a democracy, one of the first attributes we think of is free and fair elections. In the United States, one of the world's oldest and most powerful democracies, this ideal falls short when we examine the reality of our electoral procedures. Millions of Americans are denied the right to vote every election based on rules that are analogous to the old literacy tests and Jim Crow laws the civil rights movement fought so hard to defeat; of those that do cast ballots, millions more are rejected or wrongly counted because of improper ballot formats. We have one of the lowest voter turnout rates in the world for developed countries, yet we seem largely unconcerned with the massive amount of inactivity and non-participation. Advancements in technologies like Internet voting and more secure voting machines have great promise, but they remain largely unexplored for no other reason than a lack of political impetus. My research examines these and other electoral reforms that have been recommended in the United States but have hitherto been ignored or forgotten election after election. After a cumulative review of scholarly articles, from academics to think tanks to other experts in the field, this essay is a compilation of twelve of the most important suggestions for reform; each proposal is deconstructed to evaluate the validity, the implementation, the practicality and the overall worth of these reforms to the voting public. It concludes by calling readers to action, urging them to use this information to bring change to our system in the hopes of making our country a better democracy and a better international leader in promoting fundamental rights and freedoms.

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RELATIONS BETWEEN EXPOSURE TO VIOLENCE AND AGGRESSION AND ANXIETY AMONG RURAL ADOLESCENTS: THE PROTECTIVE ROLE OF IMPULSE CONTROL

Gabrielle Brost, Psychology and Criminal Justice
Terri Sullivan, Developmental Psychology, Faculty Mentor

Relations between exposure to violence (witnessed community violence and direct victimization), anxiety, and physical and relational aggression, and the potential protective role of impulse control in moderating these relations were explored among 940 predominantly Caucasian ninth graders living in a rural area of Florida. ANOVAs testing for gender differences across study variables indicated that boys reported higher levels of exposure to violence and aggression while girls endorsed higher rates of impulse control and anxiety. Using hierarchical regression analyses, it was found that higher levels of both witnessed violence and victimization were positively associated with anxiety and aggression (physical and relational). In contrast, impulse control was negatively associated with these anxiety and aggression outcomes. For anxiety, a two-way Witnessed Violence x Impulse Control and Victimization x Impulse Control interaction was found. For both relational and physical aggression, a significant three-way interaction between witnessing violence, impulse control, and gender emerged. For both types of aggression, it was found that high levels of impulse control operated as a protective factor for girls who had high amounts of witnessing violence. These findings provide important information about violence exposure in rural communities and also have important implications for intervention efforts in rural areas.

THE RELATION BETWEEN ANXIETY, SIBLING CHEMICAL USE, AND DRUG USE IN ADOLESCENTS

Gabrielle Brost, Lauren Perry, Jessica Rich, Trevor Solderholm, Psychology and Criminal Justice
Wendy Kliewer, Psychology, Faculty Mentor

This research project examined the moderating effect of anxiety on the relation between sibling chemical use and drug use in adolescents amongst urban adolescents. The sample was comprised of primarily African-American adolescents living in an urban environment. The effect of sibling chemical use on youth drug use was assessed using regression analysis. Also, the potential moderating effect of anxiety on this relation was examined in the same regression analysis. It was found that significant gender differences were present for anxiety, with females reporting higher levels of anxiety than males. Youth drug use was significantly correlated with sibling chemical use ($r=.37, p < .01$). Total anxiety was also significantly correlated with sibling chemical use ($r=.12, p < .05$). Results also indicated that there was a significant two way interaction between Anxiety x Sibling Chemical Use. These findings have important implications for prevention and intervention programs, especially those in which considerable emphasis is placed on family environment and familial influence.

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ENVIRONMENTAL REMEDIATION THROUGH NANOSCALE ZERO VALENT IRON (NZVI) FOR REDUCTION OF CHLORINATED VOLATILE ORGANIC COMPOUNDS

Lester W. Brown II, Chemistry

Everett E. Carpenter and Garry P. Glaspell, Chemistry; Michael D. Shultz, Radiology, Faculty Mentors

Nanoscale Zero Valent Iron (NZVI) particles have become a material of interest due to their small size, large surface area, and enhanced magnetic properties relative to their bulk counterparts. Due to these properties, NZVI have become prevalent in industrial, biomedical and environmental applications. The use of NZVI in environmental remediation is of particular interest. Large industrial areas containing underground storage tanks (UST) are a cause of ground water and soil contamination from chlorinated volatile organic compounds. Through the use of NZVI, CVOC can be reduced to simple organic compounds that are easily absorbed or digested through anaerobic processes. Considerations for NZVI include size, charge, surface functionalization, cost and efficiency. Methods for the synthesis and surface functionalization of NZVI are examined as size and charge affect mobility of the particles through the contaminated area during remediation. Monitoring of the remediation is conducted through pH testing and determination of electrochemical potentials as the CVOC are reduced to less harmful organics.

SIMULTANEOUS CICLIZATION AND LABELLING OF LINEAR PEPTIDES

Pedro B Carneiro, Chemistry

Matthew Hartman and Gajanan Dewkar, Chemistry, Faculty Mentors

Peptides are adaptable therapeutic agents used for various treatments, including cancer and post menopausal osteoporosis, for example. Cyclic peptides, more specifically, are very advantageous drug materials due to their defined conformation which makes them selective target recognizers. The cyclic structure of a peptide gives lower conformational entropy, longer biological half life, and a reduced biodegradability by proteases; each of these physical and biochemical properties improve the bioavailability of cyclic peptides relative to linear ones. The problem however is finding ways to cyclilize and label linear custom-made peptides to improve specificity and permeability. We have developed a cyclization assay for peptides based on MALDI-TOF MS., that cyclilizes and labels, simultaneously, peptide libraries. The assay introduces a linker (Table 1) to a peptide chain containing 2 residual cysteines at each end. The cyclization was confirmed by mass spectroscopy analysis, and the derivations of dibromo xylene, when the two bromine atoms are found to be in the same ring, were observed to be the best cyclilizing agents. The expected result for the addition of such linkers is to promote stability for the newly cyclic conformation, promoting permeability, and increasing selectivity.

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REDUCING INJURY DUE TO HEART ATTACKS: A NOVEL APPLICATION OF ERECTILE DYSFUNCTION DRUG TADALAFIL

Vinh Q. Chau, Biology

Fadi N. Salloum, Rakesh C. Kukreja, Internal Medicine, Division of Cardiology; Faculty Mentors
Funding provided by a grant through the National Institutes of Health and the Honors Summer Undergraduate Research Program

Background: Myocardial infarction (MI) severely reduces cardiac function despite recent therapeutic advances. Tadalafil, a novel long-acting phosphodiesterase-5 inhibitor, induces cGMP accumulation by preventing its breakdown. Because overexpressing cGMP-dependent protein kinase-G (PKG) has shown to attenuate MI injury, we hypothesized that PKG activation with tadalafil would lessen MI injury following ischemia/reperfusion (I/R). Methods and Results: ICR mice were pretreated with tadalafil (1mg/kg; ip) or 10% DMSO (vehicle) one hour before 30 minutes of ischemia by left coronary ligation and 24 hours of reperfusion. KT5823, a specific PKG inhibitor (1 mg/kg, ip), was given 10 minutes before pretreatment. Cardiac PKG activity was determined at one hour after treatment with tadalafil or vehicle. Following reperfusion, left ventricular (LV) function was assessed with echocardiography; infarct size (IS) was measured by TTC staining. Myocardial IS (mean±SE) was reduced with tadalafil (13.2±1.7%) in comparison to vehicle (40.6±20.5%, P<0.05). KT5823 abolished the tadalafil-induced cardioprotection (IS: 39.2±1.0%). Alone, KT5823 had no effect on IS (40.9±0.9%). Tadalafil preserved LV fractional shortening (FS) (31±1.5%) post-infarct, as compared to vehicle (22±4.8%, P<0.05). Baseline FS was 44±1.7%. KT5823 treatment before tadalafil diminished FS (17±1%), indicating a loss in the preservation of function. At the time of ischemia, PKG activity (A450/mg protein) was increased in tadalafil-treated mice (154.6±25.5) as compared to vehicle group (83.5±10.8), suggesting PKG involvement in the cardioprotection. Conclusions: Tadalafil increased cardiac PKG activity, which attenuated injury and improved LV function post I/R. Our data imply phosphodiesterase-5 inhibition as a novel therapeutic tool in improving the outcomes of patients post MI.

NEIGHBORHOOD DIFFERENCES IN MESSAGES ABOUT USING AGGRESSION AND REPORTED AGGRESSION AMONG URBAN ADOLESCENTS

Nicole Constance, Psychology and Anthropology

Wendy Kliever, Psychology, Faculty Mentor

Funding provided by the National Institutes of Health, the National Institute on Drug Abuse and the Honors Summer Undergraduate Research Program

The present study investigated neighborhood differences in parental support for aggressive problem solving, and neighborhood differences in aggression among adolescents, using data from 313 families in a longitudinal study of violence, coping, and adjustment in youth. One adolescent (M = 13.95 years, SD = 1.54, 55.6% female, 90.9% African American or black) and one maternal caregiver from each family participated in face-to-face interviews. Information on neighborhoods was obtained from the United States 2000 Census, and the neighborhoods were divided into four groups based on differences in the percentage of female-headed households with children living below the poverty line. Parental support for aggressive and non-aggressive problem solving was obtained from the Beliefs about Aggression and Alternatives Scale. Maternal reports of their child's aggression was obtained from the Child Behavior Checklist (CBCL), and adolescent self-reports of aggression were obtained from the Problem Behavior Frequency Scale (PBFS). Analysis of variance was used to test the hypothesis that neighborhood differences existed for parental support of aggression and use of aggression by adolescents; group differences were explained using Tukey's HSD. For parental support of aggressive and non-aggressive problem-solving, as reported by both maternal caregivers and adolescents, mothers were more likely to support the use of aggression for problem solving in

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the neighborhoods with the highest percent of the predictor variable compared with the lowest percent group. From the CBCL, there was an overall neighborhood difference on the Delinquency subscale; no group differences were significant. Also from the CBCL, there were neighborhood differences for maternal-reported aggressive behavior, with mothers in the highest percentage groups being more likely to report more aggressive behavior in their adolescents than in the highest SES neighborhoods. From the PBFS, adolescent self-reports of physical aggression achieved marginal significance, and no specific group differences were observed.

THE CHANGE IN FEMALE FRIENDSHIPS OVER TIME

Carly Croft, Criminal Justice

Bonnie Orzolek, University College, Faculty Mentor

Although it has been a long upheld belief that female friendship is necessary and plays an important role for women, female friendships have changed over time. There is evidence that Victorian era female friendships (1837-1901) were much more intense and involved than female friendships are now. Research shows that modern day female friendships are fragile and prone to breaking up. This research examines reasons and causes for change in the nature of and motivation behind female friendships. I propose that because women are no longer confined to their homes with their families and close friends, and women work many hours a day outside of their homes, female friendships have become more difficult to create and maintain, and are relatively superfluous. Adding that to the fact that society is also ever changing does little to show promise for female friendships. The major change that has affected this particular issue is the introduction of communication technologies, i.e. telephones, cell phones, computers, and internet. This is supported by the increasing trend of multimodality in communication. Communication is the most fundamental and necessary skill for a friendship to survive, and I believe that in addition to the women changing because of working outside the home and having less time at home with friends, new communication technologies have caused communication to be less intimate and involved, thereby causing weakened friendship bonds among females and inability to communicate effectively. This paper will discuss reasons for why female friendships have changed over time.

FORGIVENESS AND THE COMMENSURABILITY OF GOODS SCALE (COGS)

Karl Dorn, Psychology and Philosophy

Everett L. Worthington, Jr., Psychology, Faculty Mentor

When considering two options, will it always be the case that either one option will be better than the other or that both options will be equally good? Could it be that there is sometimes no fact of the matter about how one option relates to the other because the goodness of the options are qualitatively distinct from each other in such a way that the options become incomparable? This is a philosophical question. However, how a person answers it is of profound psychological importance. The Commensurability of Goods Scale (COGS) assesses the degree to which goods are seen as interchangeable. If people perceive everything in life to be interchangeable (i.e., the highest COGS score), then they will conduct themselves differently than they would if they believed that what is lost can sometimes never be replaced (i.e., a low COGS score). This is of great importance to psychological theorizing in forgiveness because it demonstrates a difference between a mere return to a pre-offense state and one that is accomplished via forgiveness. Namely, one might return to a pre-offense state because everything that was wrongfully lost is believed to have been fully replaced and compensated for. Such a return hardly seems to be forgiveness, nor indeed even a virtuous act. Or people can return because they have given an altruistic gift of letting go of personal resentment or personal negative feelings towards the offender. Sample items for both a personality trait-level scale and a scale that is domain-specific to transgressions are provided,

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as well as hypotheses about predictive, convergent, and discriminant validity of the COGS. Applications are also reviewed.

ARSENIC AND OLD LACE: A FORENSIC TOXICOLOGY PROSPECTUS

Lyndsay S. Durham, Forensic Science
Michelle R. Peace, Forensic Science, Faculty Mentor

This research uncovers the history of forensic toxicology and arsenic testing, including its introduction to the courtroom. The first qualitative test for arsenic came as a result of the 1752 case of Mary Blandy, while the first quantitative test for arsenic occurred with direct correlation to the 1840 case of Marie Lafarge. The Marsh Test for arsenic first appeared in the courtroom during the Lafarge case through its introduction by the leading expert at the time, Mateu J.B. Orfila. The basic principles behind the Marsh Test for arsenic still find use today in modern instrumentation.

ANGER MANAGEMENT & FEMALE INMATES

Nicole A Durose, Social Work and Spanish
Peter Nguyen, Social Work, Faculty Mentor

Among the industrialized nations, the United States continues to have the highest rate of incarcerated persons. The proposed research evaluates the effectiveness of anger management classes for female inmates. Anger is an emotion with which almost everyone is familiar. However, not everyone understands how to regulate their anger. Understanding and dealing with anger is especially an issue for inmates. However, most research has focused on men and has ignored the unique challenges women face with anger. Through the use of anger management classes, female inmates will learn how to manage their anger. Determining if this type of class is effective or not is applicable to the social work practice because it can help us find what needs to be changed or added in order to raise the quality of our society.

MULTIMEDIA ART ADVOCACY – “aMUSEment”

Kevin Estes, Music; Peter Soroka, John Labra, Brittany Shade
Brian Jones, Kris Keeton, Music; Robert Carter, Fine Arts
Funding provided by the VCUarts Grants for Undergraduate Students
Mr. Estes will perform on his sculpture at 1pm.

The goal of this project is to promote arts advocacy by appealing to diverse populations through mixed media. Through this interdisciplinary project, students from the Sculpture, Graphic Design, and Music Departments have generated one multifunctional art work that personifies a percussion instrument and can take the role of a sculpture. Graphic artists have assisted with computerized abstracts to help with construction and lecture/demonstrations. Musicians play the sculpture as a percussion instrument and visual artists have presented it as a sculpture. Each student will participate in every phase of development including design, sculpting, and musical composition. In culture today, visual art and music rarely interact in our society as one medium of education and employment. As young artists about to enter a new phase in life, we believe that art advocacy is extremely important in keeping art alive in America's society. Developing the skill to collaborate with artists of other disciplines will build more opportunities for education and employment as well as enlarge audiences. In an effort to enhance social interactions of the arts, we have used the completed work to reach out to students through musical performance and visual aesthetics. In addition we plan to reach out to the community through exhibitions at various venues such as art galleries and public performance venues. We project that by giving free public performances and exhibiting the

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sculpture will convince society that art interaction is important in education as well as everyday life.

[RE]CREATION

Elisabeth Forde, Homeland Security and Emergency Preparedness; Prerak Patel, Mass Communications-Advertising
Sarah Branigan, School of the Arts, Faculty Mentor

How do we inform youth to act and sustain the drive towards a more environmentally responsible future, specifically through creative reuse? Today there is a trend to be “green” or environmentally conscious but little action. Action can be difficult for children and young adults because environmental responsibility requires a lifestyle transformation. The poster will highlight a local non-profit, Stuff Inc, whose mission is to “provide Richmond with a community space for creative reuse, education, environmental awareness, and fun stuff.” Stuff is able to overcome the most significant barrier to youth involvement in environmental action, providing recreation and education simultaneously. The non-profit inspires kids to not only act in environmentally responsible ways but also dream and create. The poster will illustrate examples of creative reuse that may stimulate the youth to look beyond conventional recycling. The “stuff” in our environment can be used again for a different purpose instead of being thrown away; the concept of cradle-to-cradle production and consumption, rather than cradle-to-grave. Stuff promotes the restoring of our planet by preventing the buildup of waste in landfills. The goal is to convey a fun and exciting way to reuse, resulting in increased efficiency of product use rather than re-processing.

SEX EDUCATION IN IRAN

Peter Ghamarian, Biology and Chemistry
Bonnie Orzolek, University College, Faculty Mentor

Since the conception of the Islamic Republic after the Iranian Revolution of 1979, the Iranian people have had to follow Islamic Law, which has led to such things as an Islamic dress code for men and women, the restriction and closing of newspaper and media outlets, systematic human rights violations including the mass executions of members of the overthrown monarchy, as well as the suppression and subduing of millions of Iranian women. Iran has seen a tremendous reduction in all things “western” under the hard-line rule of this extremist theocracy. This abatement of western influences in the country has unfortunately created a lack of knowledge, attitudes, and sources of information regarding sex, pregnancy, and HIV/AIDS in Iranian adolescents, leading to what the World Health Organization has called “an alarming trend” of a drastic increase in the rate of HIV infection in Iran. After a cumulative review of all recent published research done on sexual activity in Iran, this poster was put together in order to present a thorough study of startling statistics and possible solutions to this previously unexplored problem of Iran’s system of sex education, or lack thereof. Although sex outside of wedlock being deemed unacceptable in Islam has led to a lack of sex education for the youth under the Islamic Republic of Iran, this age group’s sexual and reproductive health needs cannot be ignored any longer because STDs, abortions, and HIV rates are at an all-time high in the region. International pressure is required now more than ever in order to develop a culturally sensitive model of sex education that will effectively turn about the harmful lack of basic sex education for the Iranian youth.

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LETHAL MYOCARDIAL ISOTHERM TEMPERATURE DURING RADIOFREQUENCY CATHETER ABLATION

Aneesh Goel, Finance and Chemistry

Mark Wood, Internal Medicine, Division of Cardiology, Faculty Mentor

Introduction: Radiofrequency (RF) catheter ablation cures many cardiac arrhythmias by heat-induced injury to arrhythmogenic tissue. In isolated guinea pig papillary muscle, the temperature for irreversible myocardial injury is 48-50°C. The lethal temperature for large tissue sections, as occurs in clinical practice, has not been established. This study investigates the lethal isotherm in porcine ventricular myocardium preparation.

Methods and Results: Domestic pigs (*S. domestica*) were euthanized and their hearts obtained according to IACUC protocol. RF lesions were delivered to isolated porcine myocardial tissue in a warmed saline bath (37°C) using a closed-irrigation RF ablation catheter. Infrared (IR) images were taken at the end of the RF energy delivery. Optical images were taken after lesion staining (2% triphenyltetrazolium chloride) to delineate viable from non-viable tissue. The lethal isotherm was determined by an image fusion overlay of optical and thermal images using FLIR Reporter software (v8.2) to determine the temperature corresponding to the edge of the lesion. The visual boundary of the lesion was marked on the optical image; this was then compared to the IR isotherm corresponding to the lesion edge. The average IR isotherm was found to be 59.7°C ± 5.79°C, while the average lesion temperature was 58.9°C ± 3.08°C.

Conclusion: These results suggest that the lethal isotherm in RF cardiac ablations is 59–60°C, which is much higher than the previously accepted temperature of 48-50°C. The accurate definition of this lethal isotherm has direct implications for clinical procedures and the design of catheter ablation equipment.

THE USE OF PRE-PCR WHOLE GENOME AMPLIFICATION TO AMPLIFY SINGLE POLLEN GRAIN DNA FROM CORNUS FLORIDA

Vinodhini Gowda, Biomedical Engineering

Rodney Dyer, Biology, Faculty Mentor

Funding partially provided by the Honors Summer Undergraduate Research Program

Gene movement between individuals affects the genetic structure of the population and its overall fitness. Plants have two mechanisms of gene dispersal, by pollen and seeds. The majority of current research focuses on the fertilized individuals after dispersal but not about the mechanisms of the spatial movement of genes prior to pollination. Moreover, pollen that is wind dispersed can be easily characterized by diffusion models whereas the factors influencing insect-mediated pollination are both more complicated and less understood. This research attempts to develop a separate model to predict insect-mediated gene flow by tracking individual pollen grains using genetic fingerprint technologies to provide a more complete picture of how genes are dispersed across a forested landscape. We studied *Cornus florida* (flowering dogwood) in an experimental population from Virginia Commonwealth University's Inger and Walter Rice Center for Environmental Sciences. The goal of this student's part in the overall project was to amplify DNA from single pollen grains that were collected directly from plants in the field and from pollinating insects. Whole genome amplification, polymerase chain reaction, and gel electrophoresis were used to develop a protocol amenable to conducting large scale parentage analysis originating from single grains. This approach to understanding pollen movement will provide a valuable tool for quantifying contemporary gene flow, developing genetic conservation strategies, understanding the impacts of land use on future population structure, and even be of use for monitoring transgenic gene escape.

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THE SOVIET LUNAR EFFORT

Anthony Greco, Chemistry
Faye Prichard, University College, Faculty Mentor

When President Kennedy first committed the United States to a manned lunar landing it seemed an impossibly tall order. Even more difficult would be the unspoken goal of achieving a landing before the Soviets. Yet when the moon dust settled the Soviet Union had not even attempted a landing. This begs the question “Why did the Soviet Union never land a man on the moon despite their apparent lead in the space race?” The question is especially relevant today as the US mounts another lunar effort. Information gained since the fall of the Soviet Union regarding the failure of their lunar program could prove invaluable in avoiding similar pitfalls. A number of materials both Russian and American from before and after glasnost reveal the reasons for the Soviet’s reversal of fortune. First and foremost among these is an account of the Soviet program as it was occurring by defector Leonid Vladmirov. His book was the first to suggest that the Soviet’s apparent lead in the space race was a façade. This is contrasted by the work of American journalist William Shelton who lauded the Soviet’s superiority in the years leading up to the American’s moon landing. However, it was Vladmirov who was vindicated by the investigations of American researchers who took advantage of the openness of glasnost. His assertions that the Soviet’s lacked the rocket power and computer technology necessary for a moon landing were later confirmed by prominent researchers James Oberg and Charles Vick. Another key element in the Soviet failure was the untimely death of the program’s Chief Designer Sergei Korolev. The purpose of this research is to determine which of these factors is the ultimate cause of the Soviet’s failure to land on the moon.

THE AFFECTS OF THE HOLOCAUST ON THE PEACE EFFORTS BETWEEN ISRAEL AND PALESTINE

Anjali Hari, Biology, History and Spanish
Bonnie Orzolek, University College, Faculty Mentor

Since the end of the Cold War, many peace efforts have been made to relieve the conflict between Israel and Palestine which arose after the creation of the Israeli state and the advent of Zionism in the early 1900s. In the early 1990s, the Oslo Declaration of Principles was signed by the Palestinians and the Israelis but the ink was barely dry by the time Palestinians were retiring to terrorist attacks and Israelis were coming up with new restrictions such as settlement expansions, checkpoints, and closures. Like peace efforts made during the Cold War, it failed within years because of suicide bombers, the Second Intifada, and the influence of Western Nations. Much research has been conducted on the reasons for the ongoing violence in the Middle East between the Arab nations and Israel and like the media often presents, the causes mentioned have to do primarily with the religious differences and contradictory politics of the two states. The purpose of this research was to look into the effects of the Jewish Holocaust in the propagation of the conflict in the Middle East. After conducting a cumulative review of past research conducted on the issue using various journal articles and UN findings, it was found that the Holocaust indeed plays a role in the relations between Israel and Palestine as it affects the psyche of Israelis-collectively and individually and creates strong feelings of guilt and “moral blindness” among Western Nations. In reviewing this research through a poster, people can gain a deeper understanding of the conflict in the Middle East and look at the issue from not just a historical perspective but also a psychological perspective. We can only hope that in looking at the conflict from different lights, peace may be achieved one day.

ABSTRACTS ALPHABETIZED BY PRESENTER

EXAMINING WORKING MEMORY USING TIC TAC TOE

Calesha Hayes, Holly Guelig, Psychology
Michelle Ellefson, Psychology, Faculty Mentor
Funding provided by a grant through the British Academy

Working memory and executive control are brain processes studied in order to better understand cognitive functions. A study was performed to look at working memory, which is the procedure of temporarily storing and using information.

The study included 215 participants with 106 males and 109 females ranging from 6 years of age to adults. Working memory was studied using a computer program called *Tic Tac Toe*, designed by Mariette Huizinga (Huizinga, Dolan, & van der Molen, 2006). Participants viewed different arrangements of Xs and Os on a three by three grid. Participants were presented with one arrangement and viewed it for as long as they needed to remember the pattern. After the familiarization phase, they were presented with a series of Xs and Os and pressed a button when they believed they were viewing the correct arrangement. Participants' reaction times (RT) were measured in milliseconds (ms).

An analysis was performed using the data analysis software, JMP, on reaction times of accurate participants who correctly identified the arrangement. Overall, the participants did well on this task, responding accurately to 76% of the trials with a reaction time of 554.15 ms. Adults responded the most accurately at 97% and responded the quickest at 428.01 ms. The youngest age group responded the least accurately at 59% and they took the longest amount of time to respond at 678.10 ms.

Children have difficulty with working memory at young ages, but the results show that these executive functions become easier throughout development. It is important to understand these differences so that education and curriculum development are appropriately designed for the intended age group.

THE BIOLOGICAL ACTIONS OF HYDROXY-CIS-TERPENONES

Tristan Hayes, Lin Zhang, Bioinformatics
Jennifer Stewart, Qibing Zhou, and Ghislaine Mayer, Biology, Faculty Mentors
Funding provided by a grant through the Jeffress Memorial Trust J-849, NSF Grant MCB-0131419 and the Honors Summer Undergraduate Research Program

Hydroxy-cis-terpenone (HCT) was synthesized by Dr. Qibing Zhou in the VCU Chemistry Department. Previous studies demonstrated that HCT protects human liver cells from aflatoxin. Additionally, Dr. Ghislaine Mayer in the VCU Biology Department found that HCT killed all blood stages of *Plasmodium falciparum*, the parasite responsible for most cases of human malaria. The goal of this project was to investigate mechanisms of HCT actions. The data indicated that HCT decreases cellular accumulation of aflatoxin by decreasing the binding of aflatoxin to intracellular liver microsomal proteins. This finding suggests that HCT is a competitive inhibitor of protein binding. HCT also decreased the accumulation of estrone-sulfate in both uninfected human red blood cells and cells infected with *Plasmodium falciparum*. Estrone-sulfate is a major substrate for several organic anion transporters and multi-drug resistant transporters. Effects of HCT on the activity of these transporters will be investigated in the future.

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WHO DOESN'T WANT TO BE HEALTHY? - HEALTH CARE: ECONOMIC COSTS, INEFFICIENCIES AND SOLUTIONS

Niyant Jain, Economics

Faye Prichard, University College, Faculty Mentor

The world revolves around three things, food, water, and shelter. With thousands of years of progression in civilizations, many people are able to access the three necessities for the benefit of their health. In the United States, health needs are met through the means of capitalism. Capitalism is the economic system in which the means of production are owned by private persons and operated for profit. The prices of goods and services are predominantly determined through the operation of a free market. However, not everyone can afford healthcare and health insurance, especially the elderly. Many choose to use their money towards other goods; subsequently, healthcare becomes a merit good, a commodity that everyone should have, yet many do not. The U.S. government has the highest per capita health care spending in the world, but its health care system is cost inefficient, suffers economic costs, and needs to be reexamined with other nations' programs as models to provide for better economic stability in the long run. Various insurance programs and the government funded programs of Medicaid and Medicare are structurally inefficient and 15.7% of the United States is still without any sort of health coverage. Insurance premiums are increasing and with the entrance of the baby boom generation into retirement, the total federal Medicare outlays will rise from 4 percent of the GDP in 2007 to 12 percent in 2050. The health care systems of Canada and Great Britain are thoroughly examined in order to see the viability of such alternatives in the United States. Both systems are far more cost efficient, reduce health administration costs, and use a less percent of each country's GDP. Immediate actions need to be taken to tackle current healthcare programs. After all, without good health life cannot be enjoyed to the fullest.

PHYSIOLOGICAL AFFECTS OF MEDITATION ON THE BRAIN AND POTENTIAL PREVENTION OF ALZHEIMER'S DISEASE

Kunal Kapoor, Religious Studies

Faye Prichard, University College, Faculty Mentor

Neurodegenerative diseases without cure, such as Alzheimer's disease, have been pervasive throughout the elderly population, rendering many treatment responses, both pharmaceutical and alternative. Although acetylcholinesterase inhibiting and glutamate inhibiting drugs have shown promise in treating the ailment, they are not free of side-effects, and are only able to treat, rather than reverse or prevent the onset of the disease. This shortcoming has made alternative methods of treatment more appealing. A recent light has been shed on the correlation between meditation and physiological affects on the brain. Recent studies have proven that meditation is able to increase cortical thickness and strengthen cortical growth in areas of the brain responsible for somatosensory processing. Stimulating the cortex region of the brain by meditation may prevent the thinning of the frontal cortex that normally occurs with the progression of age. Furthermore, structural changes of the brain have been associated with meditation. Meditators have been shown to possess decreased degeneration of occipitotemporal regions of the brain as well as a greater distributed thickness to the right hemisphere of the brain to areas such as the right anterior insula. The physiological alterations of the brain caused by meditation overturn previous dogma that neuroplasticity and cortical plasticity are unattainable as one grows older. Structural changes have all been confirmed by fMRI testing. Aside from structural changes, meditators have also demonstrated larger amplitude gamma-wave oscillations as confirmed by electroencephalogram testing (EEG). Increased gamma waves can boost memory, information processing, and levels of focus. As these alterations to the brain have been attained without negative side-effects,

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future studies may point to meditation's efficacy and convenience in combating and preventing Alzheimer's disease and possibly other neurodegenerative disorders as well.

ADULT ATTACHMENT AND ROMANTIC EXCLUSIVITY: FACEBOOK HABITS OF THE INSECURE KIND

Phillip S Keck, Sandra R Heims, Psychology
Jody Davis, Psychology, Faculty Mentor

Attachment theory posits that individuals differ in their tendencies to create and build meaningful, interdependent relationships with close others, originating with the first of all intimate relations, the child/caretaker bond (Bowlby, 1977; Ainsworth, Blehar, Waters, & Wall, 1978). Future relationships are sincerely affected by the manner in which the primary caretaker, usually the mother, is consistently available to fulfill the needs of the infant. Initial research linking developmental attachment ideas to adult relationships was first undertaken by Hazan and Shaver (1987). They found similar distribution patterns of attachment in adults as were evident in infants and children. Young adults in the technology age have taken to the virtual airwaves in their quest to form meaningful relationships, utilizing an abundance of popular social networking websites. Researchers at Virginia Commonwealth University are currently completing an investigation into the relation between the different attachment styles, secure, anxious-ambivalent, and avoidant, and social networking habits. The study also aims to uncover young adults' reliance on the social networking site, Facebook, to fulfill social needs as a function of their commitment in exclusive romantic relationships. In the current research, participants (N~50) were administered the 36-item Experience in Close Relationships – Revised (ECR-R; Fraley, Waller, & Brennan, 2000) and the 8-item Facebook Intensity Scale (FIS; Ellison, Steinfeld, & Lampe, 2008). In this presentation, we will report Pearson correlations hoping to reveal a significant relationship between the outcomes as well as preliminary findings concerning romantic exclusivity, commitment, and social networking habits.

SELF-EFFICACY AS A MEDIATOR IN TOBACCO-USE RESISTANCE IN ADOLESCENTS

Phillip Keck, Jennifer Callear, Kathryn Conley, Earl Dowdy, Psychology
Earl Dowdy, Psychology, Faculty Mentor
Funding provided by a grant through the Virginia Tobacco Settlement Foundation

According to Social Cognitive Theory (SCT; Bandura, 1986), individuals learn behavior patterns and consequences through social observation and modeling. For example, an adolescent emulates the behavior of his or her parents or peers. SCT also emphasizes a singularly important outcome of learning new behaviors – the growth of “self-efficacy,” or the individual's belief in his or her ability to competently perform a given behavior. According to SCT, individuals are more likely to favor and perform behaviors for which they have developed a sense of self-efficacy. For example, an adolescent may practice role-play resistance to smoking and as a result gain confidence in their ability to resist, and then actually engage in resistance to smoking initiation. A team of researchers with the Life Skills Center (LSC), Virginia Commonwealth University, recently completed a group-randomized, controlled efficacy trial of a school-based, health-promotion intervention called LIFT+. The intervention aimed to enhance adolescents' healthy behaviors, health knowledge, and health-related skills and self-efficacy regarding the avoidance of tobacco products and the consumption of fruits and vegetables. LIFT+ is an enhanced version of LIFT, Living Free of Tobacco, an LSC intervention that was tested in several rural Virginia school districts. LIFT+ added a healthy eating component to previously tested materials on tobacco-use prevention, goal setting, and the effects of advertising on health-related behaviors. LIFT+ was designed to employ LSC-trained high-school peer volunteers to administer an 8-session curriculum to middle school students in health/PE classes. In the efficacy trial, ten rural Virginia middle schools were randomly

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assigned to the intervention (n=5) or delayed control (n=5) condition. All 7th graders in these schools were recruited to complete baseline, post-test and 1-year follow-up surveys. In this presentation we will report preliminary data (N~ 1,000) showing significant intervention effects in participants' self-efficacy to avoid and resist tobacco use.

IS REASONING ABOUT CHEMISTRY CONSTRAINED BY CAUSAL PARSIMONY?

Hima Khamar, Michelle Ellefson, Christian Schunn, Biology and Chemistry

Michelle Ellefson, Psychology, Faculty Mentor

Funding provided by a grant through the National Science Foundation and the Honors Summer Undergraduate Research Program

Grasping scientific phenomena requires the creation of appropriate models of relations among many variables, frequently of a causal form. The chemical world contains few examples of simple causation. Instead, multiple factors interact to produce outcomes, e.g., chemical reactions occur only when multiple reactants react to create new product(s). Despite the general importance of understanding how children make sense of interactions among multiple causal variables, relatively few studies on reasoning seriously investigate this issue. Do children simply add new information to their mental models, or do they follow some sort of causal parsimony replacing old ideas with new ones? Our goal was to capture students' causal models of chemical phenomena and to examine whether these models change after instruction. The participants were urban high school chemistry students (n = 69, mean age = 16.77, SD = 3.61) completing a 6-week unit concerning the chemistry of paint-making, designed to give students a more in-depth causal understanding of important chemistry concepts. During the unit, students created their own shades of paint by combining different chemicals in their own experiments. Students completed a concept mapping activity before starting and after completing the unit, i.e., pretest and posttest to answer the question 'What causes different paints to be different colors on different substrates across time?' Our results suggest that students used causal parsimony, replacing some of their naïve conceptions with what they learned while creating paint. However, students continued to use atomic explanations sparingly, indicating that students were willing to adopt shallow-level causal explanations, but were reluctant to do the same for deeper-level chemical processes.

PREVALENCE OF HAEMOSPORIDIA IN A BREEDING POPULATION OF PROTONOTARIA CITREA IN VIRGINIA

Olga Kochurova, Biology

Ghislaine Mayer, Biology, Faculty Mentor

Funding partially provided by the Department of Biology

Protonotaria citrea, commonly known as Prothonary Warbler, is a golden Neotropical songbird that nests in tree cavities along the eastern coast of U.S. and southern Canada. In Virginia, they are most commonly found nesting along tidal tributaries of the Chesapeake Bay. The *P. citrea* population has been declining due to destruction of lowland forests and avian diseases. Climate changes are expected to increase the incidence of zoonotic avian diseases. This study is part of a larger continuing study that was founded by Dr. Charles Blem, ornithologist and ecologist from the VCU Department of Biology. The overall goal of the project is to understand the ecological factors leading to disease transmission at the local level. This study focuses on the pathogens of the genus *Haemosporidia*, which cause avian malaria in the *P. citrea* population and on the flaviviruses which cause West Nile virus and Saint Louis Encephalitis. Currently there are 650 nest boxes installed in appropriate habitats in the tidal freshwater region of the James River. The data collection took place at this site in summer of 2008. Blood samples were preserved with the use of FTA cards. The presence of *Haemosporidia* was measured using molecular techniques such as Polymerase Chain

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Reaction (PCR) and flaviviruses were detected using a test kit. We have shown that 60% of the birds tested in 2008 were positive for *Haemosporidia* while 32% were positive for West Nile virus and 6% positive for St. Louis encephalitis. The data collected in the season of 2008 will be compared to future seasons and the mode of transmission will be investigated. We will also determine if the incidence of zoonotic avian diseases affects the breeding success of the *P. citrea* population in Virginia.

THE REACTIONS OF METAL COMPLEXES WITH DIAZOACETATES

Scott Koehn, Chemistry

Scott Gronert, Chemistry, Faculty Mentor

Funding provided by a grant through the National Science Foundation

Metal carbenes are key intermediates in organic synthesis and represent the prime tool for the formation of cyclopropane derivatives. They generally are formed in a catalytic process by the action of a ligated transition metal with a diazo derivative. Once formed, the highly reactive metal carbene rapidly transfers the carbon center to alkenes or other substrates such as sulfides. Because of their high reactivity, it has been difficult to characterize the first step in the process, formation of the metal carbene. Gas-phase work is ideally suited for studying the factors that affect the formation of the metal carbenes and control their subsequent reactivity. The studies focus on three metals, iron, cobalt, and manganese, and two multidentate ligands, salen and porphyrin. As reagents, ethyl diazoacetate and t-butyl diazoacetate have been investigated. The major product channels are addition with the loss of N₂ (i.e., metal carbene formation) and adduct formation. Sequential additions of the reagents are also seen at higher flow rates or longer reaction times. The branching between addition/elimination and adduct formation is metal dependent and metal carbene formation is most likely with cobalt and least likely with iron. In the cobalt/salen system, a series of 7 salen complexes with ring substituents of varying electron-donating/withdrawing capabilities were used. The rate data indicate that electron-donating substituents significantly retard the rate of carbene formation with methoxy giving the slowest reaction.

CONSUMER-PRODUCER INTERACTIONS AT A MOLECULAR LEVEL: INTEGRATED NETWORK METABOLOMICS IN DROSOPHILA MELANOGASTER AND SACCHAROMYCES CEREVISIAE

Kamya Kommaraju, M. Ryan Woodcock, Bioinformatics

Danail G. Bonchev, Mathematical Sciences, Faculty Mentor

Yeasts represent the major essential food source of both adult and larval *Drosophila*; thus an understanding of the interactions between *Drosophila* and yeast are central in interpreting the ecology and life history of these two organisms. In a natural context it has been observed that multiple yeast species are often isolated from digestive samples of wild *Drosophila*, and that *Drosophila* reared on monocultures of yeast species demonstrate inferior developmental time compared to those reared on inter-specific yeast polycultures. Potentially these observations may indicate that dietary complementation of key drosophilid metabolites may take place in yeast polyculture, or that some concerted response by yeast producers takes place against *Drosophila* consumers when yeast are released from competitive confamilial interactions. This pilot study establishes a framework to investigate the shared and respective metabolic network properties for *Drosophila* and yeast. Various combinations of whole metabolic networks with the enzymes, proteins, and compounds (metabolites) found in both organisms were constructed for *Drosophila melanogaster* and *Saccharomyces cerevisiae* using data collected from KEGG (Kyoto Encyclopedia of Genes and Genomes) database and PathWay Studio 6.0 (Ariadne Genomics). The individual networks of these two models were observed in isolation, in union, and at the integrated interface of essential nutrients produced by yeast and

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sequestered by *Drosophila*. Statistical properties of network subgraphs were analyzed for all metabolic networks using FANMOD. It was hypothesized that certain reoccurring subgraphs (motifs) would be statistically over-represented at all levels of the network hierarchy; the presence of such would have implications toward understanding potential selective forces operative in network natural history. Future research will adapt this methodology to build integrated metabolic networks involving additional genera of yeast and *Drosophila* species.

THE EFFECT OF MENTAL RETARDATION ON FAMILY RELATIONS

Neerav Mangipudi, Biology and Economics
Bonnie Orzolek, University College, Faculty Mentor

Mental retardation is a generalized disorder characterized by sub average cognitive functioning and deficits in adaptive behavior and mental functioning. Mental retardation affects millions of individuals in America and millions more worldwide. However, research on mental retardation, specifically research geared towards familial and societal impacts, was not in effect until the late 1960s. Families with a mentally retarded member were passively looked upon with pity and scorn, and no research was conducted with the exception of minor studies regarding the relationship between mothers and their mentally retarded children. Early research indicated that strained family relations was directly caused by mental retardation and resulted a high incidence of institutionalization. More recent research on mental retardation has drifted from the social isolation and chronic stress aspects of mental retardation to focus on family relations and demographics. A cumulative review of research has shown that each member of the family has a unique role. A careful analysis of these roles can result in a societal change favoring deinstitutionalization and social acceptance of mentally retarded individuals. Individually, however, these studies lack the thoroughness to make a tangible difference. Therefore, this research presentation will scrutinize the roles of mothers, fathers and siblings. The poster will outline a proposal on how each of these entities can customize the orthodox views of family relations in order to maximize functional ability and the potential well being amongst family members. The only way to brighten the outlook for mentally retarded individuals is to preponderate outdated assumptions about seemingly insurmountable burdens and stress with optimism for increased familial closeness and “affective solidarity.” The potential to turn a seemingly grim family situation into an environment that maximizes life satisfaction and overall morale exists; it is simply a matter of enlightening our society and pursuing the possibilities.

LYING: LEARNING OR THE BRAIN?

Monica McLemore, Pre-Pharmacy
Bonnie Orzolek, University College, Faculty Mentor

Why is that humans are so drawn to the habit of lying, though many times we do not believe it to be intentional? Looking at youth, we see that even small children deceive. According to Piaget, we undergo stages of moral development, and around age 8, there is a certain distinction between deceptive actions and rightful actions, referred to by some as the theory of the mind. The behavior of lying is influenced by many factors, from culture type to personality type. As studies have shown, different culture types, mainly collectivist and individualist, have shown opposing differences in the acceptability of lying in social situations. In personality studies, it was determined that “known” liars are more manipulative, more social, and more concerned with self-presentation. Delving into more personality studies, I wanted to find more information on types of people who lie; therefore I looked into studies on pathological liars. One of the newest proposals is that the prefrontal cortex is highly involved in the behavior of lying. Although the development of the habit of lying is widely accepted as a learned behavior, recent research studies introduces the idea that intentional deception is

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more than a developmental trait, but rather an executive brain function, correlated with increased amounts of prefrontal white matter. Through evolution and animal studies, it has been shown that the developing size of the neocortex corresponds with the deception rate in primates, showing that deception may be more of a biologically-related trait than we initially assumed. Research on this subject must be further continued. There is not enough evidence to conclude a cause-effect relationship between human neurology and human deception.

THE FORMATION AND ELIMINATION OF 2-METHOXYESTRADIOL IN THE HUMAN PLACENTA

Rachel Ann Miller, Biology and Chemistry

Phillip Gerk, Pharmacy, Department of Pharmaceutics, Faculty Mentor

Funding partially provided by the HHMI Summer Scholars Program

Pregnancy-induced hypertensive disorders, including preeclampsia, are a leading global cause of deaths associated with pregnancy. Preeclampsia is associated with a deficiency in catechol-O-methyl transferase activity, which results in lower levels of 2-methoxyestradiol. 2-Methoxyestradiol is an endogenous metabolite of 2-hydroxyestradiol that affects angiogenesis. The formation of 2-methoxyestradiol from 2-hydroxyestradiol is dependent on activity of the enzyme catechol-O-methyl transferase (COMT). The goal of this study is to correlate the formation of 2-methoxyestradiol with COMT expression in the human placenta. Human term placenta villous tissue was fractionated to obtain cytosol and microsomes. The cytosol was incubated in the presence of 2-hydroxyestradiol, extracted and analyzed by reverse-phase HPLC with fluorescence detection. A linear increase of 2-methoxyestradiol was found over time. The protein was analyzed for catechol-O-methyl transferase by Western blotting, and both soluble and membrane-bound forms of COMT were detected. Future studies will correlate the expression of catechol-O-methyl transferase to its activity.

URINE DRUG TESTING

Katherine N. Moore

Michelle Peace, Forensic Science

This presentation compiles a timeline of the evolution of forensic urine drug testing. Stemming from the Vietnam War to public, private, and Federal employment, this timeline traces the main events that led to widespread awareness of drug abuse and initiatives to create a safe and drug-free workplace and analyzes the events leading to implementation of employee drug testing.

STRUCTURAL CUES: THE INFLUENCE OF COLOR AND FONT TYPE ON LEARNING COMPLEX INFORMATION

Tamika Moore and Jazmon Dabney, Psychology and Criminal Justice

Michelle Ellefson, Psychology, Faculty Mentor

Previous Research found that learning complex information was facilitated by at least two types of structural cues: the use of parentheses and spatial location. Pilot data previously collected indicated that color and font cues might also improve learning. Our goal for this study was to further already known information on statistical patterns. This was done by testing the influence of color and font type on learning complex information. Participants (VCU students) were asked to complete a task that would take 60 minutes. First was the dots task, in which the participant sees items in which they have to identify the number within. The dots

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task, tests for color blindness and those determined to be color blind are screened out of the color cues condition. After determining whether the participant is color blind or not they will be randomly assigned to one of the four conditions. These include the no cues, font, color, and color and font conditions. Once the participant is assigned to a condition they will complete the second task which is broken up into three blocks. They will see a string of letters that will appear and after a brief pause will have to type in the string of letters that they just saw. The third task is separated into two blocks and appears as a string of letters where a letter will be missing. The participant will have to choose the letter that completes the string. As we continue to collect data we expect to find that different cues help to influence how people learn complex information. The results of this study could help to apply any new and already known information, towards helping individuals with special needs; such as those with learning disabilities.

AN INVESTIGATION OF GENDER STEREOTYPES AND POLITICS

Christopher A. Morgan, Psychology

Natalie J. Shook, Psychology, Faculty Mentor

The notion of the “glass ceiling” is used to explain the phenomenon that leadership positions continue to be held predominantly by males and implies that there is a barrier of discrimination towards female success. Eagly & Karau (2002) have suggested in their Role Congruity Theory that the small percentage of women in leadership positions is in part due to the conflict between female stereotypes and leadership stereotypes. That is, leadership traits (e.g., pragmatic) violate traditional female attributes (e.g., caring). Thus, occupancy of leadership positions by women compromises the perceivers’ expectations of the female gender role. The goal of the present research was to investigate how individuals’ perceptions of gender roles relate to political ideology and attitudes toward leadership, specifically voting intentions. One hundred and thirty-five Psychology 101 students at Virginia Commonwealth University participated in the study for one hour of research credit. During study sessions, participants completed a series of questionnaires that assessed voting intentions, endorsement of gender roles, and political ideology. Beliefs in gender stereotypes were also measured by having participants make a series of trait ratings in which they rated a number of social groups, including males and females, on several stereotypically male (e.g., aggressive) and female (e.g., gentle) attributes. Participants who reported more traditional attitudes toward gender roles tended to be more politically conservative. They also were more likely to report stereotypical voting intentions. That is, they were more likely to vote for White males than other social groups, such as females or racial minorities. The results provide support for Role Congruity Theory and the relation between gender stereotypes and leadership attitudes. The current study particularly highlights the role of gender stereotypes in the political domain and has implications for voting behavior.

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EFFICACY OF A COMMUNITY-BASED PROGRAM THAT ASSISTS INDIVIDUALS WITH A MENTAL ILLNESS AND SUBSTANCE ABUSE DISORDER WHO HAVE BEEN IN TROUBLE WITH THE LAW

Lauren A. Myers, Social Work

Monica Leisey and Humberto E. Fabelo, Social Work, Faculty Mentors

Funding provided by the School of Social Work Field Department

This study evaluates the efficacy of a community-based program that assists individuals with a mental illness and substance abuse disorder who have been in trouble with the law. The sample consists of 14 participants who were or are currently enrolled in the program. Of these 14 participants, 50% are male and 50% are female. In addition, the participants are predominately Caucasian (72%); while African American participants represent 21% and participants that identify as other represent 7%. Each participant completed a baseline interview at the time of his or her entry into the program and a six-month interview (six months after his or her entry into the program). The interviews were conducted confidentially in a structured, face-to-face interview format. The study looks at significant increases or decreases in specific areas of client functioning. Analyses found a significant decrease in alcohol use, alcohol use to intoxication, drug use, arrests, and nights incarcerated from baseline to six-month. Analyses conducted of data from a scale to measure psychosocial functioning (specifically, difficulties in specified areas of life) found some areas that suggest program effectiveness and others that do not show any significant change. In the areas where no significant changes were found, six-months may not be enough time for change to occur.

SISTERS ACROSS THE AISLE: VIRGINIA WOMEN LEGISLATORS

Jennifer Nguyen, Psychology and Pre-Pharmacy

Deirdre Condit & Janet Hutchinson, Wilder School of Gov't. and Public Affairs, Faculty Mentors

Funding partially provided by the Honors Summer Undergraduate Research Program

In 1920, the nineteenth amendment guaranteed women the right to vote in the United States. Nearly immediately afterwards in 1924, two women were voted to the House of Delegates in Virginia. Despite this promising start today women still make up less than 20% of the Virginia Legislature. The purpose of this research project is to explore the lives of past and present women legislators to find trends that might explain why there is such a gross disproportion between the number of male and female Virginia legislators in the House of Representative and the Senate. It focuses on categories such as political party, age when first elected, reasons for running for (and leaving) office, significant others, children and their ages at the time of election, education and occupation, and other offices held. Research found that the mean age at the time of election was 48.7 (House) and 51.6 (Senate). A number of them had been educators, and most were married with children that were teenagers. Interestingly, of the 54 women that served in the House, nearly half of them had only been elected in the past two decades. Furthermore, although the reasons for entering office varied, most women legislators tended to leave office due to retirement, losing reelection, or redistricting.

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NEUROPLASTICITY, REWIRING YOUR BRAIN

Plamen Nikolov, Biomedical Engineering
Bonnie Orzolek, University College, Faculty Mentor

In 1612 Galileo Galilee first proposed the theory of the universe and laid the foundation for the theory of localizationism: that each part of the brain is thought to have its own respective function, similar to that of a complex machine with numerous parts that work together to make the whole operate. In this theory, should one part of the brain be damaged or lost then that user would lose that part's respective function. That's what we have always taught to believe – there is no hope for children that have learning disabilities and all those of patients suffering from neurological defects such as blindness, deafness, and paralysis. This theory is wrong. In order to truly understand how the brain is able to reorganize itself we must first try to disbelieve every “basic” notion we were ever taught to believe when we grew up. This means that we must try to not think along the lines of “we see with our eyes, hear with our ears, taste with our tongues, smell with our noses, and feel with our skin.” (Doige) Just as the famous neuroplastician Bach-y-Rita said, “We see with our brains, not our eyes.” Our eyes, ears, skin and tongue are merely external receptors that translate different external energies into electrical signals – the universal language of the brain. These signals go to specific cortices which “all have similar six layer structures,” (Mountcastle) and thus, in theory, each cortex should technically be able to interpret electrical signals for any other cortex, thus allowing the brain to reorganize itself should it need to compensate for a missing part in order to retain a jeopardized function. Neuroplasticity argues for the theory of the plastic nature of the brain, ever changing and ever able to change in response to the environment.

DNA PROBES FOR GENOTYPING CRYPTOSPORIDIUM PARVUM AND CRYPTOSPORIDIUM HOMINIS

Ezenwa Obi Onuoha, Virginia Union University, Biology
Luiz Shozo Ozaki, Microbiology and Immunology, Faculty Mentor
Funding provided by a grant through the National Institutes of Health

Cryptosporidium is a human and animal parasite. Cryptosporidium hominis and Cryptosporidium parvum are two major species of concern. Cryptosporidiosis is a disease that is common in both *C. hominis*, and *C. parvum* infections. In this study, we used 18S rRNA gene probes 18SF (5'-GTTGATCCGCCAGTAGTC-3') and 18SR (5'-TAAGGTGCTGAAGGAGTAAGG-3'), and species-specific oligonucleotide probe Lib13SF02 (5'-TTTTTTCATTAGCTCGCTTC-3') with the anti-sense probes Lib13SRT-1 (5'-ATTTATTAATTTATCTCTTACTT-3) for *C. hominis*, and Lib13SRT-2 (5'-ATTTATTAATTTATCTCTTCG-3' for *C. parvum* to genotype DNA extracted from human and animal hosts in Chile using Polymerase Chain Reaction (PCR) based 18S rRNA gene assay, and Lib13 assay, respectively. Using the probes listed above we were able to genotype Cryptosporidium DNA samples isolated from both human and bovine hosts from Chile in July of 2008 and February of 2009. Due to the difficulties encountered when extracting Cryptosporidium DNA samples in the past, collaborators in Chile used multiple extraction conditions in order lyse the Cryptosporidium protective oocyst. Based on the current results of this study we are able genotype *C. hominis* only in DNA samples isolated from humans, and *C. parvum* in DNA samples isolated from both human and bovine host. The results of this study tell us that there are possible zoonotic infections of *C. parvum* in Chile, which encourages for an in-depth epidemiological study in this geographic region.

ABSTRACTS ALPHABETIZED BY PRESENTER

STUDENTS CAUSAL REASONING ABOUT GENES

Mariam Osman, Health, Physical Education and Exercise Sports Science
Michelle Ellefson, Psychology, Faculty Mentor

Causal reasoning is the idea that any cause leads to a certain effect and is an example of inductive reasoning. Causal reasoning is what allows us to deduce what the cause of a specific event or reaction maybe. In this study students were asked a biological question and were prompted to create a concept map to illustrate the answer to a question. The question posed was “What causes the cells in your body to express different traits even though they have the same DNA?” Students were provided with nodes that had terms to illustrate what made some cells different from others despite the fact that they shared the same DNA. The students were told to group related node terms and to also connect them using drawn in lines between terms or groups.

All of students who participated in the study were chosen at random and were given both pre and post tests. One group of the students did not receive any type of guided tutorial that addressed the prompted question. The second group of students took the pre-test, were given a guided tutorial and then were given the same prompt and were asked to create a concept map that would illustrate the answer to the prompt using what they learned.

An analysis of the data so far indicates that students that receive a guided tutorial before the prompt were more likely to use accurate terms in their responses, accurate groupings and connections and were able to more accurately use causal reasoning. It is important to understand how to effectively foster causal reasoning in students because it will make the learning process more efficient.

PERCEPTION OF STEREOTYPES AMONG AFRICAN-AMERICAN WOMEN

Brooke M. Owens, Virginia Union University, Psychology
Heidi F. Villanueva, Virginia Union University Psychology, Faculty Mentor

This study was designed to examine the relationship between African American women and everyday stereotypes they face. The study included a group of 20 African American college students who attended Virginia Union University. The participants were given a survey of 20 questions to answer. Most of the participants agreed that they face discrimination and negative stereotypes every day. This study originated from the book "Shifting: The Double Lives of Black Women in America" by Charisse Jones and Kumea Shorter-Gooden, and was modified to fit African American college students.

ABSTRACTS ALPHABETIZED BY PRESENTER

EUGENICS—A RESURGENCE CONNECTING REPRODUCTION WITH CONSUMERISM

Alexis Park, English

Bonnie Orzolek, University College, Faculty Mentor

Eugenics, as defined by its creator, Sir Francis Galton, is the “science of improving heredity.” In the past it involved the practice of discouraging and even not allowing those seen as “unfit” to breed, while encouraging the more “fit,” eminent beings to reproduce. Regulation of reproduction was accomplished through social methods, medical methods, and psychologically. The idea of eugenics intertwined social concerns with science as eugenicists sought to improve the whole of society through scientific selection, similar to Darwin’s ideas of natural selection. However, in the last decade, scientific selection and eugenics have begun to resurge as a result of advances in biotechnology. Technology is continuing to advance at a rapid rate and we are quickly approaching the ability to create “designer” children as sex selection and gene alteration are already possibilities. However, there are endless possibilities as to what science will be able to do because there are not any current regulations on many biotechnologies. These advancements need to be closely regulated and monitored so that we do not repeat the history of eugenics as we are coming dangerously close to establishing a strong connection between reproduction and consumerism.

AFFIRMATIVE ACTION IN EDUCATION: LESSONS FROM ITS "MISSING MINORITY"

Krina Patel, Biomedical Engineering

Bonnie Orzolek, University College, Faculty Mentor

Most research on affirmative action in college admissions has focused heavily on its benefits, mainly providing educational opportunities for “underrepresented minorities” (i.e. African Americans and Hispanic Americans) and increasing campus diversity, often at the expense of White Americans or other racial minorities. Relatively few studies discuss affirmative action’s detrimental effects, including the reasons for its anomalous exclusion of Asian American students, the “missing minority,” who often make up significant portions of student bodies at selective colleges where affirmative action is used. Even fewer studies recognize affirmative action as a provisional policy designed to compensate for the achievement gap present at grade-school level. Thus, this research uses a thorough review of literature to fuse together policymaking, educational statistics, culture theory, and American Dream mentality to analyze Asian Americans’ complex relationship with affirmative action and more importantly, explain their traditionally high academic performance despite their status as minorities. I claim that affirmative action in admissions is unnecessary and punitive to all students, and claim that as a more viable alternative, students and communities should build from the Asian sociocultural value model for academic achievement, which has proven so successful thus far. If followed, such a model would encourage genuine “equal opportunity,” strengthen community values, and work toward bridging the achievement gap, rather than excusing it.

ABSTRACTS ALPHABETIZED BY PRESENTER

THE INFLUENCE OF GENDER ROLES, ETHNIC IDENTITY, AND CONDOM ATTITUDES ON CONDOM NEGOTIATION AMONG AFRICAN AMERICAN WOMEN

Brittney Pearson, Hiawkal Gizachew, Ashleigh Leftwich, and Kristina Hood, Psychology
Faye Belgrave, Social Psychology, Faculty Mentor

Among the 126,964 women living in the United States with HIV/AIDS, 64% are African American (CDC, 2008). The current study will address this health disparity by examining the impact of gender roles, ethnic identity, and condom attitudes on condom negotiation efficacy among college-aged African American women. The aforementioned variables were chosen due to their influence on the sexual relationships of black women. For example, Buckley and Carter (2005) state that identification with a masculine orientated gender role, which is common among African American women, may encourage assertiveness in sexual relationships and increase condom use. In addition to gender roles, ethnic identity is cited as a protective factor against risky sexual behaviors for African American women (Armistead et al 2003). Furthermore, a look at condom attitudes reveals that many African American women “may not insist on condom use because they fear that their partner will leave them or abuse them” (CDC, 2008). Using data gathered from Gumboyaya’s SISTA Project it is hypothesized that African American women who identify with a masculine gender role orientation will report higher condom negotiation efficacy in comparison to African American women who identify with a feminine gender role orientation. Additionally, African American women who report higher ethnic identity will report higher condom negotiation efficacy in comparison to African American women who report lower ethnic identity. Finally, African American women who report positive condom attitudes will report higher condom negotiation efficacy than those who report negative condom attitudes. Results from this research will be influential in modifying existing HIV/AIDS prevention programs for African American women.

ASSOCIATION STUDY BETWEEN GABA RECEPTOR GENES AND ANXIETY DISORDERS

Xuan Pham, Biology and Psychology
Jack Hettema, Psychiatry, Faculty Mentor
Funding provided by a grant through the VA Institute for Psychiatric and Behavioral Genetics

Human anxiety disorders are complex diseases with relatively unknown etiology. Dysfunction of the GABA system has been implicated in many neuropsychiatric disorders, including anxiety and depression. In this investigation, we explored four GABA receptor genes for their possible associations with genetic risk for anxiety disorders. Using multivariate structural equation modeling, we selected twin subjects scoring at the extremes of a latent genetic risk factor shared by neuroticism, several anxiety disorders, and major depression from a large population-based twin sample. Our study sample consisted of 589 cases and 539 controls (n=1128), which we subjected to a two-stage association study. In stage 1, all genetic markers were screened, and only positive results were tested for replication in stage 2. We genotyped altogether 26 single nucleotide polymorphisms (SNPs) from the four GABA receptor genes. Of the 26 SNPs genotyped in stage 1, we identified four markers in the GABRA3 gene that met the threshold ($p \leq .1$) to be tested in stage 2. Of those four markers, we found marginally significant association for rs6627221 ($p = 0.07$) in the replication stage. Because the GABRA3 gene is located on the X-chromosome, we also examined frequency differences for these markers between males and females. This suggests some associations are male-specific. Our findings suggest that some variants in the GABA gene system may contribute to genetic risk for human anxiety disorders. Further follow-up studies are necessary to determine the full extent to which polymorphisms in the GABA system affect the genetic predisposition for anxiety disorders.

ABSTRACTS ALPHABETIZED BY PRESENTER

PARENTAL ACCEPTANCE AS A MODERATOR BETWEEN VICTIMIZATION AND INTERNALIZING AND EXTERNALIZING PROBLEMS IN URBAN ADOLESCENTS

Katelyn Procci, Terria Jones, Brooke McKay, Sarah Smith, Felicia Page & Nicole Constance, Psychology
Wendy Kliewer, Psychology, Faculty Mentor
Funding provided by grants through the National Institutes of Health and the National Institute on Drug Abuse

We explored the association between victimization and internalizing and externalizing problem behaviors as moderated by parental acceptance in urban adolescents. The present study was conducted as part of a semester-long project for Dr. Wendy Kliewer's prevention research internship at Virginia Commonwealth University in Richmond, Virginia. The data used was collected for Project COPE, a four-year longitudinal study examining how exposure to stressors such as violence and poverty are associated with physiological responses and adjustment. Our sample consisted of 358 adolescent-maternal caregiver dyads recruited from neighborhoods affected by high rates of violence and poverty. The mean age of the adolescents was 13.95 with a standard deviation of 1.54. The sample was 55.60% female and the majority of the sample was African American (90.90%). Thirty-four percent of the families had a weekly household income of less than \$300.00 per week. Twenty-three percent of the maternal caregivers in the sample had not completed high school and 41% of the maternal caregivers had never been married. We ran a series of regressions to explore the association between victimization and anxiety, victimization and depression, and victimization and physical aggression as moderated by parental acceptance. While parental acceptance was not found to serve as a moderator between victimization and depression, anxiety, or physical aggression, we did find that victimization was positively associated with acts of physical aggression which means that children who have been victimized are more likely to also be physically aggressive, and that parental acceptance has a negative association with depression. These results suggest that while parental acceptance is not a moderator of the association between victimization and internalizing and externalizing problem behaviors, the effects of victimization have long-term implications for externalizing, but not necessarily internalizing, problems.

BODY IMAGE AND SATISFACTION: A CULTURAL PARADOX

Yasmin Qaseem, Biology
Bonnie Orzolek, University College, Faculty Mentor

Previously, much research has been conducted on body image and body dissatisfaction of primarily middle class Caucasian, adolescent females. This group is often thought of as being most affected by negative body image and high levels of dissatisfaction. The primary cause of this dissatisfaction is thought to be the effects of Western culture and ideals on the mindset of women and the ensuing desire to be thin. However, it is unfair that the majority of past research has been focused on privileged Caucasian females. Researchers have primarily focused on this group because of common belief that this group is mostly affected by body image problems and body dissatisfaction. Since most of the research has been focused on this group, ethnic minorities have stayed out of the focus of body image research until fairly recently. This unfair treatment of ethnic minorities has led to very little study of the role of cultural factors on body image. Slowly increasing amounts of research have shown that body image varies widely across ethnicity and culture; many different components are involved. This poster presentation will shed light on the paradox that exists between the body ideals and standards of attractiveness of the individual cultures and the overall Western culture. This presentation provides a cumulative review of research on the body image of African American, Hispanic American, and Asian American women. This research was conducted to determine trends of body dissatisfaction and the strong cultural factors that lead to these trends. There

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will be a focus on the conflicts found between the ideals of these cultures and the overreaching Western culture.

VISUALIZING THE EARLY DEVELOPMENTAL STAGES OF ZEBRAFISH EMBRYOS USING GREEN FLUORESCENT PROTEIN (GFP)

Ruslana Remennikova and Jamie McLeod, Biology and Chemistry
Robert Tombes, Biology, Faculty Mentor

A study is being conducted to observe the role of Ca²⁺/calmodulin-dependent protein kinase type II (CaMK-II) during early embryonic development of zebrafish, *Danio rerio*. CaMK-II is a ubiquitously expressed multi-functional serine/threonine protein kinase shown to play a role in such things as cell migration, neurite outgrowth and cell cycle progression. This ongoing research was started by the graduate student Jamie McLeod in the fall of 2008. There are five main periods of embryogenesis, including the zygote, cleavage, blastula, gastrula, and segmentation periods. Jamie's primary goal is to visualize CaMK-II's effect on cell morphology and motility during the blastula, gastrula and segmentation periods of early zebrafish development using confocal microscopy. My focus is to clone a green fluorescent protein (GFP) tagged CAAX motif. The CAAX motif is membrane-targeted, which when tagged by GFP will allow for the visualization of each individual cell during embryogenesis. When GFP-CAAX is injected into the zebrafish embryo at the one cell stage, individual cells are fluoresced, enabling cell number, cell motility, and cell morphology to be examined during early developmental stages of *Danio rerio*.

INVESTIGATING THE DISCRIMINATIVE STIMULUS PROPERTIES OF THE CLOZAPINE METABOLITE N-DESMETHYLCLOZAPINE IN C5BL/6 MICE

William D. Renzulli, Jason M. Wiebelhaus, Sarah A. Vunck and Joseph H. Porter, Psychology
Joseph H. Porter, Psychology, Faculty Mentor

N-desmethylclozapine (NDMC), the major active metabolite of the atypical anti-psychotic drug clozapine, expresses unique pharmacological properties that may be indicative of antipsychotic efficacy in people with schizophrenia. Similar to clozapine, *in vitro* observations demonstrate the ability of NDMC to act as a serotonin 5-HT₂ antagonist; however, NDMC differs from clozapine by acting as a partial agonist at dopamine D₂ and muscarinic M₁ receptors. (Gray et al. 2007; Maggio et al. 2008). Because of its muscarinic M₁ agonist properties, it has been proposed that NDMC may be used to treat cognitive impairments in schizophrenic patients (e.g., Li et al. 2005). Previous studies conducted in our lab showed that NDMC does not substitute for clozapine in C57BL/6 mice trained to discriminate 2.5 mg/kg clozapine from vehicle using a standard two-lever operant task. In the present study 12 male C57BL/6 mice were trained to discriminate 10.0 mg/kg NDMC from vehicle. Mice acquired the discriminative stimulus of NDMC in a mean of 27.5 training sessions (range 14 to 58 sessions). Generalization tests revealed that clozapine fully substituted for the 10.0 mg/kg NDMC discriminative stimulus at doses of 2.5 (86.79% DLR) and 5.0 (94.82% DLR) mg/kg, indicating asymmetrical generalization between the two compounds. These differences in generalization between the parent compound (clozapine) and the metabolite (NDMC) may be due to functional differences in activity at M₁ and/or D₂ receptors.

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PROSTAGLANDIN PRODUCTION BY INTERSTITIAL CELLS OF CAJAL REGULATES SPONTANEOUS RHYTHMIC CONTRACTION OF THE URINARY BLADDER

Vikram Sabarwal and Corey M. Johnson, Biology and Chemistry

Clinton Collins, Aaron Stike, Amy S. Miner, Paul H. Ratz, Harry P. Koo, and Adam P. Klausner, Biochemistry and Pediatrics, and Surgery, Division of Urology, Faculty Mentors

Funding provided by a grant through the National Institutes of Health

Introduction: Patients with the overactive bladder disorder tend to show elevated spontaneous rhythmic contractions (SRCs) in detrusor smooth muscle (DSM) of the bladder, which is suggested to be caused by endogenous signaling molecules known as prostaglandins (PGs). PGs are produced by cyclooxygenase (COX)-1 and COX-2. We recently determined that bladder interstitial cells of Cajal (ICC) express these isotypes. By examining the links between the stated pathways, the present study sought to lower levels of SRC through the inhibition of COX resulting in PG production that would be substantially decreased. **Method:** Longitudinal strips of the DSM free from underlying urothelium were dissected from rabbit bladder. Tissues were incubated in a physiological salt solution (PSS) for 1, 5 and 15 minutes with or without (control) the non-selective COX inhibitor, ibuprofen (IBU) 30 μ M, the selective COX 1 inhibitor, SC-560 (0.1 μ M), and the selective COX 2 inhibitor, NS-398 (0.1 μ M). Enzyme Immunoassay (EIA) was used to measure both PG production and specifically PGE2. **Results:** EIA analysis revealed a 2.5 fold increase in PG production and 4.8 fold increase in PGE2 production at 15 minutes (both $p < .05$). In the PG EIA group ibuprofen reduced PG production 56% compared to the control ($p < .05$). In the specific PGE2 analysis, a reduction in PGE2 production was seen among all 3 COX inhibitors. The reduction was 47% for NS398 ($p = .065$), 88% for ibuprofen ($p < .05$), and 45% for SC560 ($p < .05$) compared to controls. All three agents inhibited SRC. **Conclusion:** PGs and specifically PGE2 were produced by strips of bladder free from urothelium. PG production was inhibited with ibuprofen. Notably, PGE2 production was inhibited by both ibuprofen and a low concentration of COX 1 inhibitor. The COX2 inhibitor demonstrated a strong trend to inhibit PGE2 production as well. Enhanced SRC in human bladder is associated with overactive bladder.

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EXAMINATIONS OF THE PERCEPTIONS OF YOUNG TQI/DSD ADULTS (18 TO 30 YEARS OLD) ON THE IMPACT OF AGING ON HEALTH, HEALTHCARE NEEDS, AND THE WELFARE OF OLDER TQI/DSD POPULATION MEMBERS (65 YEARS AND OLDER)

Courtney Saw, Biology

Tarynn Witten, Center for the Study of Biological Complexity and Deirdre M. Condit, and Jennifer A. Johnson, Wilder School of Government and Public Affairs, Faculty Mentors

Currently, estimates state the LGBT (lesbian, gay, bisexual, and transgender) elder population includes 1 to 3 million people and is likely to grow to 4 to 6 million people by the year 2030. However, little is known about the incidence prevalence of elder trans. While this population grows, the amount of information about its health concerns does grow with it. National-level health data is almost nonexistent, and state-level data has derived mostly from the Centers for Disease Control and Prevention's Youth Risk Behavioral Surveillance System, a few households, convenience samples, and anecdotal information. As transgender persons' legal rights to health and social care are still being contested, it is apparent that this population suffers from prejudice as well as discrimination based upon their gender identity. Consequently, this community is likely to have a lower standard of living than their peers. As such, research in this field would help to improve the TQI/DSD (transgender, queer, intersex/disorders of sex development) population's quality of life by bringing to light their healthcare needs. The purpose of this research project is to ascertain how young (defined as ages 18 to 30) transgendered persons interpret and anticipate both their own healthcare needs as they age as well as those of older members of the transgender and LGBTQI/DSD population. A mixed methods survey instrument is being designed to assess the target population's perceptions on the aforementioned subjects, and its online version will be made available via VCU's Inquisit software. A multifold method relying upon snowball sampling for gathering participants will be utilized: electronic mail and direct contact meetings. Traditional descriptive statistics and graphics will be used to describe the quantitative data. SPSS 14/15 will be used for the quantitative statistical analysis with an acceptance criteria of $p < 0.05$.

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TEMPERATURE CONTROLLED SMALL ANIMAL PLATFORM FOR IN VIVO MICROCIRCULATION STUDIES

Linda Scheider, Biomedical Engineering

Brian Berger, Ivo Torres Filho, Biomedical Engineering, Anesthesiology, Physiology and Biophysics, Emergency Medicine, VCU and VCURES, Faculty Mentors

Funding provided by a grant through the AD Williams Trust Funds and the Honors Summer Undergraduate Research Program.

Mouse models are becoming more representative of human studies with the complete mapping of the mouse genome. Anesthetized mice may easily become hypothermic and exposed tissues are highly affected by environmental temperature changes. In certain applications, superfusion is not necessary: a dry, compact, inexpensive, temperature controlled platform with a clear viewing field is needed for these studies. We describe two designs for animal platforms with these characteristics. The platforms include a body heater and heated pedestal for tissue observation under an upright microscope. In the fixation area for the exposed tissue, metal cylinder heats an isolated water column. The platforms use feedback sensors and controllers to maintain a constant body temperature. One platform is very compact and is about 13 mm in height for optimal distance between the substage condenser and the microcirculation. The second is slightly taller but uses all readily available inexpensive parts for easy assembly. These platforms are ideal for studies with transillumination of small animal microcirculation. Testing of the platforms showed constant temperatures were held with time and the components are durable and reliable.

TAKE IT TO THE SKY: RELIGIOUS COMMITMENT AS A MODERATOR OF VIOLENCE EXPOSURE AND ADJUSTMENT IN LOW-INCOME URBAN ADULTS

Lisa Scott, Psychology

Wendy Kliewer, Psychology, Faculty Mentor

Funding partially provided by the Honors Summer Undergraduate Research Program

Exposure to violence has been negatively associated with psychological adjustment. Research clearly demonstrates that witnessing or experiencing violence can increase levels of depression, anxiety, PTSD, and hostility. In contrast, religiosity has been positively associated with mental health. Studies have indicated that religious commitment can increase one's satisfaction with life, and decrease levels of stress, anxiety, and depression. The purpose of the current study was to examine religious commitment as a protective factor in the relation between violence exposure and adjustment in low-income urban adults. Participants included an urban, predominantly African American sample of 319 maternal caregivers. As hypothesized, religious commitment interacted with exposure to violence to predict psychological adjustment. Specifically, there was an interaction between exposure to violence and religious commitment. For participants with high religious commitment, levels of victimization were not associated with depressive symptoms. However, when participants reported having low religious commitment, victimization was positively associated with depressive symptoms. Also, as hypothesized, there were main effects of both violence exposure and religious commitment on adjustment. Victimization was associated with higher levels of hostility, higher levels of anxiety, higher levels of depression, and lower levels of satisfaction with life. Witnessing violence was associated with higher levels of anxiety, higher levels of somatic symptoms, and higher levels of satisfaction with life. Religious commitment was related to lower levels of hostility, lower levels of depression, higher levels of somatic symptoms, and higher levels of satisfaction with life. Overall, these findings highlight the importance of violence exposure on the adult population's psychological adjustment, and how religious commitment can act as a protective factor in the relation between violence exposure and adjustment in low-income adults.

ABSTRACTS ALPHABETIZED BY PRESENTER

IN VIVO CLONING OF THE ENTIRE GENE CLUSTER OF RHIZOXIN, A POTENTIAL ANTI-CANCER DRUG

Devangi Shah, Zhe Rui, Biology and Chemistry
Tin-Wein Yu, Louisiana State University Department of Biology, Faculty Mentor
Funding partially provided by the HHMI Summer Scholars Program

Rhizoxin is a natural, anti-mitotic product, which can potentially function as an anti-tumor agent. Rhizoxin, a 16-membered macrolide, is produced by *Burkholderia rhizoxina*, an endosymbiotic bacterium isolated from the plant-pathogenic fungus *Rhizopus microsporus*. To identify genes involved in the rhizoxin biosynthesis, a cosmid library has been constructed from the total genomic DNA of the isolated *Burkholderia* symbiont. Using the conserved polyketide synthase DNA probes, we were able to identify 30 positive cosmid clones which were mapped in a 95 kilobase DNA region. A potential rhizoxin NRPS/PKS gene cluster was further located, cloned, sequenced and revealed nine open reading frames including six large NRPS/PKS genes, one encoding for the adenylation activity, one for O-methyltransferase which is expected for C-17 methoxylation of the macrolide, and a cytochrome P-450 oxygenase presumably for the epoxidation after formation of the rhizoxin macrocyclic ring. To further verify the cloned rhizoxin genes, our ongoing work will focus on the cloning of the entire rhizoxin biosynthetic gene cluster in a single broad-host range plasmid vector through the λ -RedD in vivo recombinant strategy and then reintroduce it into a related *Pseudomonas* bacterium. The plasmid pCRE5-235-87000 was constructed for in vivo rhizoxin gene cluster replacement. Our specific interest is to reconstruct the biochemical pathway through which the rhizoxins are formed.

THE EFFECT OF IMMUNIZATIONS ON CHILD DEVELOPMENT, ESPECIALLY IN AUTISM

Kathryn Shook, Psychology
Bonnie Orzolek, University College, Faculty Mentor

Vaccinations have long been recognized as beneficial to children and in protecting communities from life-threatening diseases. The majority of children receive immunizations every year, as mandated by the federal government. However, since the Hannah Poling v. Secretary of HHS case, much speculation has been done regarding a correlation between vaccines and autism. This presentation is based on a cumulative review of the literature about the possible correlation between autism spectrum disorders and vaccinations. From these scientific journals, it is obvious that scientists have not yet reached a consensus. Nevertheless, studies do indicate that there are associations between vaccines, mercury, and autism in children. Mercury has been discovered to linger in children's brains when several vaccinations are given within a close time-frame. This information remains mostly unknown to the general public and even some doctors, causing many parents and pediatricians to remain unaware of the potential problems immunizations can cause in a child's first two years of life. Because of this, pediatricians continue to enforce the recommended vaccination schedule, without acknowledging the possible dangers to children. While vaccinations are helpful in preventing serious diseases, there should be a schedule that allows more time between vaccines in children's lives so that mercury from vaccines does not build up in the child's brain, leading to potential neurodegenerative problems, such as autism.

ABSTRACTS ALPHABETIZED BY PRESENTER

GENETIC AND PSYCHOLOGICAL FACTORS THAT CAUSES A HUMAN TO BECOME A SERIAL KILLER

Sana Siddiqui, Biology
Faye Prichard, University College, Faculty Mentor

The research question being investigated is to see what psychological and genetic factors causes a human become a serial killer. The FBI's official manual defines a serial killer as someone who murders at least two people with the intent of killing again. There are three genetic disorders that have been seen in numerous cases of serial murders; schizophrenia, multiple personality disorder (MPD), and bipolar disorder. There are several psychological problems that can affect a human's ability to deal with hardships. These problems can range from a lack of proper parenting, failure to raise a child in a positive environment, and overall lack of attention to the child. Sometimes when the severity of the problem increases, people result to creating fantasies in which they have true power over others which they eventually confuse with reality.

THE FUNERAL AS A REFLECTION OF MODERN CULTURE

Austen Siebenaler, Psychology
Bonnie Orzolek, University College, Faculty Mentor

In our modern society, losing a loved one is possibly the greatest struggle that we face individually and as a culture. Death is irreversible, and no matter how hard we will against it, sooner or later we are all confronted with the imminence of mortality. In a civilization motivated by material profit, death acts as the great equivocator. Death does not discriminate based on wealth, beauty, or how well you lived your life; it is egalitarian and unpredictable. As Americans, we are comfortable with the things that we can control- the television channel babbling from the living room as we eat dinner, the kinds of food on our plates, the clothes we put on each morning, and even the type of house we live in. In a society that values control and autonomy, death represents a force to be reckoned with and ultimately feared. Funerals and commemoration rituals provide an opportunity for individuals close to the deceased to garner a sense of control through the organization of an event memorializing loss. However contemporary symbols and materials employed as manifestations of grief disguise the true nature of death beneath a façade of lifelike appearances. Therefore, while funerals may help assuage the pain of bereavement, contemporary funeral rituals are concealing the real countenance of death, and thus augmenting societal anxieties of the imminence of mortality.

ABSTRACTS ALPHABETIZED BY PRESENTER

THE DELAY AND PREVENTION OF THE ONSET OF ALZHEIMER'S DISEASE: A NUTRITIVE PERSPECTIVE

Nitin Tiwari, Statistics

Bonnie Orzolek, University College, Faculty Mentor

We live everyday in hopes that our memories will last a lifetime, but will they? Alzheimer's disease is equivalent to erasing someone's life by taking away their ability to recollect and form memories. Scientists believe this will be the fate of over 106 million worldwide by the year 2050. Alois Alzheimer was the first to describe this brain disorder in 1906 making it a relatively new disease. There has been much research on the pathogenesis of Alzheimer's since leading to suggestions that majority of the disease is controlled by one's genetic makeup and the degeneration is irreversible and progressive. However not much is known on prevention which could divert the disease and ultimately save individuals and families from much of the suffering that results from Alzheimer's. The poster reviews new research focused on a nutritive mechanism for the prevention of Alzheimer's. Causes of the disease may not be brought on by a single factor but many; every day nutrients from a myriad of sources that play a role in a web of physiological interactions are digested. This ongoing event of nutritional intake has a cumulative effect on the brain since it receives many of these vitamins, minerals, and other substances which can potentially reduce vasoconstriction and inflammation, a serious risk factor for Alzheimer's disease. Although aging and one's genetics may play roles in developing the disease, one's nutritional intake may aid in the delay and even prevent the onset of Alzheimer's. In a growing number of mouse models and more importantly human studies, nutritional intake such as alcohol and foods containing antioxidants and omega-3 fatty acids are showing promise in the prevention of the disease.

ASSESSMENT OF CHANGES IN CARDIORESPIRATORY FITNESS PARAMETERS OF MORBIDLY OBESE FEMALES FOLLOWING GASTRIC BYPASS SURGERY

SD Vesely, Franco RL, Fallow BA, Herrick JE, Larson NY, Arrowood J, Evans RK; Exercise Science

Ronald Evans, R. Lee Franco, Health and Human Performance and Internal Medicine, Faculty Mentors

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The purpose of this study was to evaluate cardiorespiratory fitness (CRF) parameters of morbidly obese females before and after gastric bypass surgery (GBS). Nine morbidly obese females (37.4±9.7 yrs; 42.9±4.1 kg/m²) voluntarily participated in the study and performed graded exercise tests prior to and 3 months after GBS. Pre and Post-GBS measures included absolute (L/min) and relative (ml/kg/min) maximal oxygen consumption (VO₂max), percentage of age-predicted maximal heart rate attained (%MHR), maximal oxygen pulse (O₂pulse), maximal respiratory exchange ratio (RER), and treadmill time to fatigue (TT). Data were analyzed using paired samples t-tests. While absolute VO₂max was not significantly different (p=0.288) between the two time points, a 20% weight reduction following GBS led to a significant increase in relative VO₂max (21.6±4.8 mL/kg/min vs. 26.2±5.4 mL/kg/min, p<0.05). Additionally, TT was significantly increased (825.6±176.6 sec. vs. 965.5±183.3 sec, p=0.018) without a concomitant improvement in O₂pulse (p=0.635), %MHR (p=0.17), or RER (p=0.617), suggesting that the increased exercise capacity was not the result of improved cardiovascular function.

ABSTRACTS ALPHABETIZED BY PRESENTER

MICROFLUIDIC STREAMING POTENTIALS INSIDE POLYCARBONATE MICROCHIPS

John Walrod, Chemistry and Biology

Julio Alvarez, Chemistry, Faculty Mentor

Funding provided by a grant through the National Science Foundation, CHE-0645494.

My research involves micro-fluidic streaming potentials generated inside of a polycarbonate microchip. Streaming potentials are an electrochemical quantitative measurement based on charge created inside of a channel as liquid flows through, and directly related to the Smoluchowski equation. Streaming potentials can be used to monitor adsorption of analyte forced through a channel, and has specific interest to the biomedicine related fields. My research of streaming potentials also involved complete fabrication of polycarbonate microchips, and two small electrical circuits used in the machine that monitor the potential. The instruments used to measure the streaming potential include the following: a vacuum pump, resistive voltmeter, controlling valve, and computer software. The streaming potentials were measured using different buffered solutions forced through the channel. The different buffered solutions were used to monitor the change in potential at different pH values. The potential was also studied by coating the inside of the channel with three different polymer solutions. The polymer solutions were used to evaluate the effect on potential due to the charge of the polymer and different adsorption rates as the liquid was forced through the channel. The potential was also measured at different values of pressure using a constant pH due to the potential being directly related to pressure. The liquid was forced through the channel at a pulsed flow compared to a constant steady flow, allowing for quicker measurements. The streaming potentials were graphed and analyzed in the different conditions, and repeated to compare the accuracy and precision of the experiment. My research will be presented in scientific poster format so that an introduction, methods, and observations section is included.

EXAMINING THE DISCRIMINATIVE STIMULUS PROPERTIES OF THE ATYPICAL ANTIPSYCHOTIC DRUG CLOZAPINE IN 129S2/SVHSD MICE

Kevin A. Webster, George C. Brimmer, Raymond M. Pettway, Sarah A. Vunck, Jason M.

Wiebelhaus, Psychology

Joseph H. Porter, Psychology, Faculty Mentor

Clozapine has long been considered the “gold standard” of atypical antipsychotic medications. It has been found to be the most effective medication used for schizophrenic patients who show resistance to treatment with other antipsychotic drugs. Clozapine’s discriminative stimulus properties have been established in a number of different animal species including rodents, primates, and pigeons, and more recently in our laboratory, mice. Studies from our laboratory have looked at clozapine’s discriminative stimulus properties in two mouse strains, C57BL/6 and DBA/2, as comparisons between inbred mouse strains can be used to reveal important differences related to genetics and behavior. In the present study 17 male 129S2/SvHsd mice were trained to discriminate 1.25 mg/kg clozapine from vehicle in a two-lever drug discrimination task for food reinforcement. The 129S2 mice acquired the clozapine discrimination in a mean of 20.64 sessions (range of 6 to 32), as compared to the DBA strain of mice who met discrimination training criteria in a mean of 10.63 sessions (range 6 to 15) and the C57BL/6 mice who met training criteria in a mean of 14.8 sessions (range 6 to 34). In addition to taking more time on average to acquire the discriminative stimulus, the 129S2 mice displayed a greater sensitivity to clozapine’s response rate suppression effects as compared to both DBA/2 and C57BL/6 inbred mouse strains as a lower (1.25 mg/kg) training dose had to be used (a 2.5 mg/kg training dose was used in the other two mouse strains).

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Thus, there are important differences between inbred mouse strains that may be useful for studying the underlying mechanisms of action of antipsychotic drugs.

THE EFFECT OF IL-10 ON ADAM-10

Kathryn Williams, Biology and Chemistry

John Ryan, Biology, Faculty Mentor

Approximately twenty million people have asthma; the percentage of children under five years of age diagnosed with asthma has increased 160% from 1980 to 1994. Currently, there are no drugs on the market that are effectively inhibiting an asthmatic response. ADAM-10 is being investigated as a method of stopping allergic inflammation. B cells produce IgE, which produces cytokines in response to foreign particles, causing an asthma attack. When CD23 binds to B cells, there is a break in the production of IgE. ADAM-10 is an influential protease expressed by mast cells which clips CD23, allowing IgE to be produced. It is hypothesized that by inhibiting ADAM-10, CD23 would not be clipped so IgE would be inhibited by the bound CD23, severely diminishing the asthma attack. Research is currently being conducted to determine how ADAM-10 is regulated. Previous research shows that interleukin-10 (IL-10) is produced by mast cells, and it inhibits ADAM-10 production. The effect of IL-10 on ADAM-10 mRNA levels is being researched. Quantitative PCR measures how IL-10 inhibits ADAM-10 expression. This technique is implemented by having two groups of mast cells. One group is treated with interleukin-3 (IL-3) while the other is treated with IL-3 and IL-10. RNA is harvested for days 1, 2, 3, 4, 7, and 10 and then the RNA is isolated and reverse transcribed. Finally, quantitative PCR is performed. Preliminary results show that ADAM-10 is initially inhibited on the mRNA level. In the future, ADAM-10 surface expression will be measured with and without IL-10 using flow cytometry. Mast cells and B lymphocytes will be cultured to look at the production of antibody. Finally, ADAM-10 expression will be monitored in vivo using mast cell extracts from mice treated with IL-10 or normal saline.

COLLEGE STUDENTS' PERCEPTIONS OF INDIVIDUALS WITH ANOREXIA AND BULIMIA NERVOSA

Natalie Wingfield, Psychology

Suzanne Mazzeo, Psychology, Faculty Mentor

Previous research demonstrates that eating disorders are often surrounded by negative misconceptions and stigma. With the mass media serving as the primary source of information about mental illness, the general public often relies on misinformation which can lead to stigmatizing beliefs. Specifically, many believe that eating disorders are self-inflicted or not as serious as other mental health problems. Such beliefs are often detrimental to the overall wellbeing of people who have mental illnesses. This study sought to extend research in this area by exploring whether perceptions of individuals with eating disorders differ depending on whether they have Anorexia Nervosa or Bulimia Nervosa. Additionally, we examined whether providing information regarding affected individuals' genetic and environmental risks for eating disorders influences the degree to which they are stigmatized. Finally, we investigated whether participants' level of previous contact with people with eating as well as their own eating behaviors affected their degree of stigmatizing beliefs. A series of questionnaires were administered to participants including an assessment of their perceptions about sixteen fictitious characters with symptoms of eating disorders. Data collection has just been completed and results will be presented.

ABSTRACTS ALPHABETIZED BY PRESENTER

THE SHAPE SCHOOL (EXTENDED VERSION)

Earl Yevak, Psychology

Michelle Ellefson, Psychology, Faculty Mentor

Funding provided by grants through the British Academy (SG-39180) and the Levehulme Trust (F/215/AY).

The Shape School (Espy, 1997) is an exercise measuring cognitive control that has been used in various studies conducted by Dr. Michelle R. Ellefson in the Instruct Lab at Virginia Commonwealth University. Dr. Ellefson's Shape School is an extended version of Espy's Shape School. The Instruct Lab seeks to explore how people learn with the goal of applying these findings to how children are being taught in elementary, middle, and high school. The Shape School exercise uses shapes and colors to test how proficient people are in controlling their executive functions. More specifically, it explores the processes of inhibition and switching. Task switching is a term used to describe how a person is able to manage their executive functioning in tasks that require the participant to inhibit or stop one response that would be correct given a previous set of rules in order to say or do something else that is correct according to the new set of rules. One of the main focuses of Dr. Ellefson's exercise was on how the complexity of a task affected the participant's ability to perform the task correctly. Task switching has been explored in similar studies, often using the popular method known as the Stroop Test. Dr. Ellefson's Shape School is important in further understanding how our brains respond when a rule is established, then changed. The participants we college aged students who signed up to fulfill a psychology course requirement. Participants were scheduled to meet in a lab and complete the experiment, which lasted approximately one hour. We recorded how long it took to complete each task, as well as how many errors the participants made, and the type of errors made.

ABSTRACTS ALPHABETIZED BY PRESENTER

Abi-Falah,	Ranya - 1	Moore,	Tamika - 19
M. Jeanette	Aiken - 1, 2	Morgan,	Christopher - 20
Alexander,	Andrew - 2	Myers,	Lauren - 21
Anand,	Kanwar - 3	Nguyen,	Jennifer - 21
Bajacan,	John - 3	Nikolov,	Plamen - 22
Blackwell,	Wren - 4	Onuoha,	Ezenwa Obi - 22
Bosch,	Sam - 4	Osman,	Mariam - 23
Brost,	Gabrielle - 5	Owens,	Brooke - 23
Brown III,	Lester - 6	Park,	Alexis - 24
Carneiro,	Pedro - 6	Patel,	Krina - 24
Chau,	Vinh - 7	Pearson,	Brittney - 25
Constance,	Nicole - 7	Pham,	Xuan - 25
Croft,	Carly - 8	Procci,	Katelyn - 26
Dorn,	Karl - 8	Qaseem,	Yasmin - 26
Durham,	Lyndsay - 9	Remennikova,	Ruslana - 27
Durose,	Nicole - 9	Renzulli,	William - 27
Estes,	Kevin - 9	Sabarwal,	Vikram - 28
Forde,	Elisabeth - 10	Saw,	Courtney - 29
Ghamarian,	Peter - 10	Scheider,	Linda - 30
Goel,	Aneesh - 11	Scott,	Lisa - 30
Gowda,	Vinodhini - 11	Shah,	Devangi - 31
Greco,	Anthony - 12	Shook,	Kathryn - 31
Hari,	Anjali - 12	Siddiqui,	Sana - 32
Hayes,	Calesha - 13	Siebenaler,	Austen - 32
Hayes,	Tristan - 13	Tiwari,	Nitin - 33
Jain,	Niyant - 14	Vesely,	Stephen - 33
Kapoor,	Kunal - 14	Walrod,	John - 34
Keck,	Phillip - 15	Webster,	Kevin - 34
Khamar,	Hima - 16	Williams,	Kathryn - 35
Kochurova,	Olga - 16	Wingfield,	Natalie - 35
Koehn,	Scott - 17	Yevak,	Earl - 36
Kommaraju,	Kamya - 17		
Mangipudi,	Neerav - 18		
McLemore,	Monica - 18		
Miller,	Rachel - 19		
Moore,	Katherine - 19		

PRESENTER INDEX By Subject

BIOINFORMATICS

Kommaraju, Kamyra - 17
Hayes, Tristan - 13

BIOLOGY

Chau, Vinh - 7
Aiken, M. Jeanette - 1, 2
Goel, Aneesh - 11
Kapoor, Kunal - 14
Kochurova, Olga - 16
Onuoha, Ezenwa Obi - 22
Remennikova, Ruslana - 27
Sabarwal, Vikram - 28
Siddiqui, Sana - 32
Tiwari, Nitin - 33
Williams, Kathryn - 35

BIOMEDICAL ENGINEERING

Gowda, Vinodhini - 11
Nikolov, Plamen - 22
Patel, Krina - 24
Park, Alexis - 24
Scheider, Linda - 30
Shah, Devangi - 31

CHEMISTRY

Alexander, Andrew - 2
Bajacan, John E. - 3
Brown III, Lester W. - 6
Carneiro, Pedro B. - 6
Koehn, Scott - 17
Miller, Rachel Ann - 19
Walrod, John - 34

CRIMINAL JUSTICE & FORENSIC SCIENCE

Durham, Lyndsay S. - 9
Moore, Katherine N. - 19

ECONOMICS

Anand, Kanwar - 3
Jain, Niyant - 14

PHYSICAL EDUCATION & EXERCISE SCIENCE

Blackwell, Wren - 4
Vesely, Stephen - 26

POLITICAL SCIENCE AND WORLD STUDIES

Abi-Falah, Ranya - 1
Bosch, Sam - 4
Forde, Elisabeth - 3
Ghamarian, Peter - 10
Greco, Anthony - 12
Hari, Anjali - 12
Nguyen, Jennifer - 21
Saw, Courtney - 29

PSYCHOLOGY

Brost, Gabrielle - 5
Constance, Nicole - 7
Croft, Carly - 8
Dorn, Karl - 8
Hayes, Calesha - 13
Keck, Phillip - 15
Khamar, Hima - 16
Mangipudi, Neerav - 18
McLemore, Monica - 18
Moore, Tamika - 19
Morgan, Christopher - 20
Osman, Mariam - 23
Owens, Brooke - 23
Pearson, Brittney - 25
Pham, Xuan - 25
Procci, Katelyn - 26
Qaseem, Yasmin - 26
Renzulli, William - 27
Scott, Lisa - 30
Shook, Kathryn - 31
Siebenaler, Austen - 32
Webster, Kevin - 34
Wingfield, Natalie - 35
Yevak, Earl - 36

SCHOOL OF THE ARTS

Estes, Kevin - 9

SOCIAL WORK

Durose, Nicole - 9
Myers, Lauren A. - 21



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