

## Schedule of Events

Wells Auditorium (Slaybaugh Hall 107)

1:00 – 1:05

Welcome & Opening Remarks

Dr. Patricia Dwyer

Provost, & Vice President for Academic Affairs of Wesley College

Wells Auditorium (Slaybaugh Hall 107)

1:05 – 1:25

Keynote Address: Matthew Gallagher

Senior Operations Consultant, Bank of America

Session I

1:35-2:15

Musical Performances

Oral Presentations

Session II

2:25-3:05

Musical Performances

Oral Presentations

Poster Presentations

Session III

3:15-3:55

Musical Performances

Oral Presentations

Session IV

4:05-4:45

Musical Performances

Oral Presentations

Poster Presentations

The Student Photography Show will remain throughout the day in the DuPont Gallery

5:00-6:00

Reception & Ceremony College Center 206

Poster Presentations in College Center Lobby

Musical Performances in the Chapel,

Oral Presentations in Wells Auditorium (Slaybaugh Hall 107),

Slaybaugh Hall 104, Cannon Hall 7,

Cannon Hall 109, Cannon Hall 110 and Parker Library 208

**Musical Performances: Session I**  
**1:35 – 2:15**

***Chapel***

*Wesley Jazz Band presents the Music of Duke Ellington;*  
David Laganella, Conductor

*Wesley College Symphonic Band;*  
Brian Cass, Conductor

*Wesley College Clarinet Trio*  
Esmeralda Elsakahawy, Leah Lowery and Kylie Liberty

**Recitations: Session I**  
**1:35 – 2:15**

***Cannon Hall 109***  
*Epic of James Morrison*  
Shane Yost

*PoetryByKJ*  
Kevin Johnson II

**Oral Presentations: Session I**  
**1:35-2:15**

***Panel 1: Cannon Hall 7***

*Studying Effects of Replacing Chlorine with Tosylate in Phenyl Chloroformate*  
Jasbir Deol

*Kinetics Study of n,n-Diisopropyl Carbamoylchloride*  
Victor DeBarros, II

***Panel 2: Cannon Hall 110***

*A Study into the Infectious Rates of Lyme Disease among Deer Ticks in Delaware*  
James M. Welsh

*Anaplasmosis and its Prevalence in Deer Ticks in the State of Delaware*  
Asia Addison

***Panel 3: Parker Library 208***

*World War II*  
Zachary Prescott

*The Progressive Era*  
Amanda Davis

***Panel 4: Wells Theater (Slaybaugh Hall 107)***

*The Variations of Stalking Legislation*  
Taylor Elizabeth Trapp

*A Case Study of Domestic Violence: Implications for Psychology and the Law*  
Tenaj Moody

***Panel 5: Slaybaugh Hall 104***

*The Effects of Riparian Buffers on Water Quality*  
David Payne

*Microbial Biofilm Disinfectant Study: Contact Lenses*  
Angela M. Clemmons

***Musical Performances: Session II***

***2:25 – 3:05***

***Chapel***

*College Choir*  
James Wilson, Conductor

*Wesley College Gospel Choir*  
Karla Jones, Conductor

**Oral Presentations: Session II**  
**2:25-3:05**

***Panel 1: Cannon Hall 7***

*The Effects of Science in the Religiosity of Students*  
Rachel E. Hausler

*Proving Bolzano-Weierstrass Theorem and Convergence of Special Sequences*  
Brittany N Kowalewski

***Panel 2: Cannon Hall 110***

*Esquivel's Reincarnation of Shakespeare*  
Terrance Olivo

*Where Hip Hop and America Clash*  
Lance Toomer

***Panel 3: Parker Library 208***

*Icelandic Music Culture*  
Alex Dello Buono

*The Impact of the Gaelic Revival Movement on Modern Irish Culture*  
Nia Fortier and Nicole Fortier

***Panel 4: Wells Theater (Slaybaugh Hall 107)***

*United States Influence on Syrian Civil War*  
Kira Tieman

*From Geronimo Pratt to H. Rap Brown*  
Terrance Wingate

***Panel 5: Slaybaugh Hall 104***

*How the Tablet Industry is Changing Business and Society*  
Devan Bartell, Michael Chiedi, Hannah Martin, and Anthony Tagliaferro

*A Look Into Creating a Wesley College App for Smartphones*  
Karen Wearden and Sean Hopkins

**Poster Presentations Session II**

**2:25-3:05 p.m.**

**College Center Lobby**

*Empowerment: Self-advocacy in the Management of a Cancer Diagnosis*  
Andrea Forsyth

*College Students and “Grit”: An Investigation of the Relationships Among  
Impulsivity, Academic Self-Efficacy, Efficacy for Self-Regulated Learning, and  
Mindsets*  
Chris Fucetola

*The Impact of Chronic Pain on Family Dynamics*  
Rebecca Martin

*#Save The Wetlands*  
Brandon Reynolds and Christopher Gendreau

*“I Control My Own Destiny”: An Analysis of Professionalism Levels of College  
Students in Relation to Self- Control and Self- Regulation Levels*  
Janel McCray

*Child Life Development*  
Brenda Hollingsworth, Danielle Tearl, Beth Mooshegian, Megan Aiello, and  
Madison Saunders

*A Comparison of the Rates of Solvolysis of 3-Chloropropyl Chloroformate at 25.0  
Celsius and 32.0 Celsius*  
Ross Beauchamp

*The Effect of Hunting on Population Dynamics of Delaware Wild Turkeys*  
Ashley Harmon

*Analysis of 3-Chloropropyl Chloroformate in Methanol, EtOH-TFE, TFE, and  
HFIP Mixtures*  
Maryeah T. Pavey

*Wesley College Efforts During National Chemistry Week*  
Kyle Gillespie

*Enzymology*  
Wendi Clark

*Bioremediation and Biodegradation*  
Tabitha Lambert

*Lipid Profiling: An Important Test In Medicine*  
Jasbir Deol

*Identification of Escherichia coli Strains Derived from the St. Jones River*  
Brett M. Sansbury

*The Benefits of Sponsorship; Who Reaps More the Sponsor or the Organization?*  
Jasmine L. Belcher

*Disseminating STEM Student Research Outcomes on Dynamic Webpages*  
Catherine Gross

*Solvolytic Studies of Cyclohexyl Chloroformate*  
Laura Malinowski and Catherine Gross

*Is Sea-level Rise Reflected in the Annual Rings of Marsh Fringing Trees?*  
Brooke Thompson

*Studying Brewer's Yeast Metabolism Using BioLog*  
Gabriel Alejandro Fernandez Bueno

*Jeffrey MacDonald: Guilty or Innocent?*  
Rachel Kurtz

*Origins of Life: Experiments in Molecular Self-Replication and Directed Evolution*  
Karri-Jo E. Walls

**Musical Performances: Session III**

**3:15 – 3:55**

***Chapel***

*Whispering*

Jana Dean

*Composition Recital*

Nick Oakley and Kia Smith

**Oral Presentations: Session III**

**3:15-3:55**

***Panel 1: Cannon Hall 7***

*BMI, Impedance and Caliper Test for Comparison of Body Fat*

Catherine Gross

*Solvolysis of Diallylcarbamyl Chloride*

Kyle Gillespie

***Panel 2: Cannon Hall 110***

*Kinetics of Yeast in Beer*

Maryeah T. Pavey

*The Distribution of the Lone Star Tick, Amblyoma americanum, and the Disease*

*Human Monocytic Ehrlichiosis in the State of Delaware*

Amber Wiltbank

***Panel 3: Parker Library 208***

*California Bay Country*

Samantha Mahoski and Kourtney Lake

*Broad to Haight: A Students Guide from East to West but Nothing in Between!*

Frederic Sottnick and Julian Borris

***Panel 4: Wells Theater (Slaybaugh Hall 107)***

*Writing Codes for Computer Assisted Instruction*

Riza C. Bautista

*The Collaboration Between Media Arts and the New First Year Seminar*

Danielle Reid, Jennifer Holland, Dylan Cochran and Derrick Schleich

***Panel 5: Slaybaugh Hall 104***

*Cincinnati v. Mapplethorpe*

Isnara St. Phard

*Hip-Hop on Trial: The case against Lil Kim*

Tamisha Thomas

***Oral Presentations: Session IV***

***4:05-4:45***

***Panel 1: Cannon Hall 7***

*The Whetstone Goes Multimedia: How Multimedia Packages are Conceived and Produced for the Web*

Brian Baker and Warren Gross

*It's Elementary, My Dear Watson: Unraveling the Mystery of Thesis Statements in Peer Tutoring*

Erin Bifferato

***Panel 2: Cannon Hall 110***

*Changes in Sea Level Rise and how they affect Riparian Buffer Zones in the Broadkill Watershed*

Kyle Frame

*Making the grey fox, weasel, and skunk a game species in Delaware*

Alex Niezgoda

***Panel 3: Parker Library 208***

*1920s: Prosperity and Panic*  
Caitlin Chaney

*Sicily Diversity Background*  
Valarie Shorter

***Panel 4: Wells Theater (Slaybaugh Hall 107)***

*Asthma in College Students: Coping & Compliance*  
Taylor R. Harvey

*The Relationship between Facility-Related Factors and Client Performance*  
Charlesha A. Harris

***Panel 5: Slaybaugh Hall 104***

*Madness in Me: The Insanity of John du Pont the Wealthiest Murder Defendant*  
John Jackson

*The Story of Amy Grossberg and Brian Peterson*  
Sherleen Sabin

***Poster Presentations Session IV***

***4:05-4:45 p.m.***

***College Center Lobby***

*Creation of a Smartphone App for Common Pesticides Used in Delaware*  
Benjamin Barile

*Regression: Basic Statistical Tool in Chemometrics*  
Jasbir Deol

*Hypoxia Induced Metabolic Changes in Cancer Cells*  
Catherine Gross

*Importance of Carotenoids, Anthocyanin and Vitamins to the Human Body*  
Doris Kwame

*Medical and Ethical Implications of Inexpensive Genome Sequencing*  
Maryeah T. Pavey

*Beta Carotene & Anthocyanin: A Biochemical Analysis for the Consumer*  
Victor DeBarros, II

*Proving Bolzano-Weierstrass Theorem and Convergence of Special Sequences*  
Brittany N. Kowalewski  
*Writing Codes for Computer Assisted Instruction*  
Riza Bautista

*The Effects of Diet, Exercise, Stress and Genetics on Aging*  
Rachel Hausler

*The Economics of Microarrays*  
Thoria Custis

*Centralized Database for Chloro- and Fluoro-formate Esters*  
Gabriel Alejandro Fernandez Bueno

*Understanding reaction pathways of agrochemical precursors*  
Brett M. Sansbury and Tabitha Lambert

*The Positive and Negative Aspects of Food Additives*  
James M. Welsh

*Treatment of Triple-Breast Cancer (TNBC): The interplay of Cancer,  
Chemotherapy and DNA Repair*  
Angela Clemmons

*Carbohydrate Metabolism*  
Brett M. Sansbury

*Meningitis Around Your Campus*  
Cierra Brown, Chelsie Rogers, Fritz Corneille, Quiana Nixon, Glenn Patrick Aruta,  
Ruth Ann Elston and Ashten Bodofsky

*The Relationship Between Impervious Surfaces, Urban Runoff, and Freshwater  
Discharge- A Case Study of Dover, DE*  
Zakary Fisch

*Correlation of BMI to Gender, Lifestyle Factors and Behaviors Of College  
Students*

Karri-Jo E. Walls

*Biochemical Process of Major Diseases*

Mouad Bekka

*HIV Awareness and Prevention in the Nigerian Community in Delaware*

Justina Okereh

*A Calculus Based Approach to Estimate the Volume of Asteroids*

Kasey Thompson

*Wildcat Landfill*

Becara Dalton

## **Abstracts**

### **Epic of James Morrison**

**Shane Yost**

**Mentor: Linda De Roche**

Jim Morrison has become a mythological figure in the United States. In pursuit to exemplify Morrison's mythological status, I have composed a new version of Morrison's biography in the form of an epic poem. By understanding Morrison's affinity for poetry and myth, there is no better form for his biography than an epic poem. Using a style similar to the great poet Homer, I have tried to equate Jim Morrison's life to an epic hero.

### **PoetryByKJ**

**Kevin Johnson II**

**Mentor: Susan Bobby**

Gun controls is a social issues poem about how the use of guns have led to many tragedies , and gets the listener thinking about their constitutional rights to bear arms . The Man 2 is a poem about what does not make a man a man. It highlights the idea of how lust can destroy a man . It is a sequel to a poem I wrote when I was 16 which was my most successful slam poem at the time.

### **Studying Effects of Replacing Chlorine with Tosylate in Phenyl Chloroformate**

**Jasbir Deol**

**Mentor: Malcolm D'Souza**

Chloroformates are important intermediates in the preparation of herbicides, fungicides, and insecticide. Phenyl chloroformate has been known to have an addition-elimination mechanism in solvents with differing nucleophilicity and ionizing power values. A compound is now synthesized from phenyl chloroformate and silver tosylate through suction filtration. Here, the leaving group is the tosylate group while in phenyl chloroformate, the leaving group is a chlorine. Tosylate is a better leaving group than chlorine. However, this should have no effect on the rate of reaction on the new compound because theoretically, the rate determining step is before the elimination of the leaving group. Therefore, the rate of reaction of phenyl tosylate should be the same as the rate of reaction of phenyl chloroformate and the mechanism reaction of this compound should be an addition-elimination reaction as well.

### **Kinetics Study of n,n-Diisopropyl Carbamoylchloride**

**Victor DeBarros, II**

**Mentor: Malcolm D'Souza**

I will be conducting research into the solvolysis of the organic compound n,n-diisopropyl carbamoylchloride; a compound used in the formation of pesticides and herbicides. With this knowledge, my mentor and I can provide the producers in the pesticide/herbicide industry with a better overall knowledge base on how this intermediate in the formation of their many products can be most efficiently and safely applied.

## **A Study into the Infectious Rates of Lyme Disease among Deer Ticks in Delaware**

**James M. Welsh**

**Mentor: Kathleen Curran**

This is a proposal to determine if the infection rates for *Borrelia burgdorferi* in the *Ixodes scapularis* population in Delaware has increased, decreased, or remained stable since they were last examined by collecting ticks using drag cloths and analyzing them for the spirochete *B. burgdorferi* through PCR analysis.

## **Anaplasmosis and it's Prevalence in Deer Ticks in the State of Delaware**

**Asia Addison**

**Mentor: Kathleen Curran**

*Ixodes scapularis*, the black legged tick, is the vector of several infectious diseases. Anaplasmosis has been found in ticks in several nearby states but has not been extensively studied in Delaware. This June ticks will be collected from all three counties in Delaware and examined for the presence of *Anaplasma phagocytophilum*, the causative agent of Anaplasmosis using polymerase chain reaction (PCR). It is expected that this research will indicate if this disease is present in all three counties in Delaware, and if so how prevalent

## **The Progressive Era to World War II; the Great Contradiction**

**Zachary Prescott and Amanda Davis**

**Mentors: Susanne Fox and Frank Gregory**

In this presentation, we explore American history from the Progressive era to the darker side of America's involvement in WWII. It explains all aspects of American triumphs and accomplishments to the hypocrisies of America's fight for freedom of everyman, while simultaneously degrading the minorities of the American population. Viewers will learn both positive and negative facts about these two eras of American history in an effort to create a well-rounded educational experience. The presentation is based on research papers that explored the triumphs and failures of the Progressive Era and the two different views of America's involvement in World War II. Teaching others about the lesser known perspectives of history through actual events in America's past is the main objective of the presentation.

## **Stalking: The Truth Behind The Laws**

**Taylor Elizabeth Trapp**

**Mentor: Cynthia Newton**

Despite the growing concern among legal scholars, the understanding of civil stalking and criminal stalking legislation in the United States remains limited. This research aims to aid social scientists, legal scholars, legislators and the public move to further explore the nature of stalking crimes. Using a qualitative approach, this research explored civil stalking and criminal stalking legislation across five selected states: Delaware, Pennsylvania, New Jersey, Virginia and Washington. The primary themes identified in the comparison of laws include jurisdiction, harshness of penalties, how strong each state's laws correlate to anti-stalking procedures and how important each state considers stalking on its political agenda. The conclusion of this research is that the reason behind why 13 of the 50 states had civil stalking statutes is because most states do not have standalone stalking statutes; mean that stalking is represented under its own penal code and not as a subtopic covered under a different penal code i.e. under harassment codes. When standalone stalking statutes do not exist it tends to mean that stalking is not considered important enough to be on the political agenda of the state.

**A Case Study of Domestic Violence: Implications for Psychology and the Law**  
**Tenaj Moody**

**Mentor: Angela D'Antonio**

This presentation is an analysis of a domestic violence case study. The victim in the case was abused severely by the defendant incurring a traumatic brain injury, resulting in her death. The defendant claimed he suffered from Post-Traumatic Stress Disorder and extreme emotional distress after his return from the war in Iraq. The psychiatric evaluations provided by the prosecution and defense were contradictory. One area of disagreement was the diagnosis of Post-Traumatic Stress Disorder. The objective of the presentation is to explore the inconsistency of information presented in the psychiatric reports and the reliability of diagnosing psychological disorders.

**The Effects of Riparian Buffers on Water Quality**

**David Payne**

**Mentor: Stephanie Stotts**

Riparian buffers consist of dense trees and shrubs that border waterways and act as a natural filter by sucking up excess nutrients (e.g., nitrogen and phosphorus) that runoff from surrounding land plots. The filtration function of riparian buffer is important because it helps to prevent hypoxic zones where fish and submerged aquatic vegetation (SAV) cannot thrive due to diminished oxygen. The goal of this study is to determine the impact of riparian zone presence on water quality. I will compare phosphorus, pH, and dissolved oxygen levels between sites with and without riparian buffers. I believe that the waterways with buffer zones will have lower phosphorus levels and a more natural dissolved oxygen and pH content.

**Microbial Biofilm Disinfectant Study: Contact Lenses**

**Angela M. Clemmons**

**Mentor: Jonathon Kidd**

Approximately 75% of Americans use some form of corrective lens to aide in visual acuity. Only 4.5 million out of the 225 million people, who wear contact lenses in America, follow the rules of proper contact lens hygiene; while more than 80 percent of people believe they do. Inappropriate hygiene practices of contact lens wearers can result in keratitis, a severe infection of the cornea. There are multiple causes of keratitis e.g. bacterial, fungal, and herpes, which in most severe cases can lead to corneal scarring, impaired vision or the need for a corneal implant. Ophthalmologists and optometrists state most eye infections from contact lenses result from improper hygiene and disinfection practices. This research experiment will be performed to determine the most efficient type of disinfection solution available for monthly contact lenses. Clear Care Solution, which is a peroxide-based solution, will be compared with non-peroxide-based solutions to compare the efficacy.

**The Effects of Science in the Religiosity of Students**

**Rachel E. Hausler**

**Mentor: Lynn Everett**

There has been speculation that the religious belief of college students decreases as they gain scientific knowledge. In this study, data collected from Wesley College students will be used to test the hypothesis that taking two or more college science courses has decreased their religiosity. A survey will be distributed to at least 100 students in science classes and will ask for

age, major, gender, and religious preference, as well as the number of science courses taken. Students will also be asked to rate the strength of their religious commitment before entering college and the current strength of their religious commitment. If there is a change, they will be asked to what they would attribute the change.

### **Proving Bolzano-Weierstrass Theorem and Convergence of Special Sequences**

**Brittany N Kowalewski**

**Mentor: Agashi Nwogbaga**

In this work, we prove the legendary Bolzano-Weierstrass Theorem for Sequences using the Monotone Convergence Theorem. We will also discuss the historical importance and contemporary relevance of mathematical sequences in technology, medicine, accounting, biomedical engineering, agriculture, music, psychology, nursing, sports, and other works of life. Finally, we will establish the convergence of a certain class of sequences.

### **Esquivel's Reincarnation of Shakespeare**

**Terrance Olivo**

**Mentor: Susan Bobby**

An analysis and comparison of Laura Esquivel's story Like Water for Chocolate and Shakespeare's play Romeo and Juliet. Critical sources are used to expand upon the major themes within Like Water for Chocolate supported by evidence from both texts.

### **Where Hip-Hop and America Clash**

**Lance Toomer**

**Mentor: Alban Urbanus**

I will discuss the ethical conflicts and challenges within the entertainment industry. I will address the issue of how the stereotypes of Hip-hop/Rap were created and also how they evolved in America. What moral values may be determined among inner urban city youth? What influence do CEOs & headline rappers have on their audience? How has Hip-hop changed America's culture? Why is Hip-hop now vital to America's culture?

### **Icelandic Music Culture**

**Alex Dello Buono**

**Mentor: Susanne Fox**

Icelandic music culture is unique compared to any other country because indie and folk music are able to dominate the mainstream. This presentation delves into the numerous factors that contributed to the development of modern music in Iceland. The research methods analyze historical events, demographics, economics, and literature that culminated in the retention of Norse folklore and mythological themes in modern music. The result of the research was strong continuity from Medieval era Iceland's folklore to the naturalistic/mystical themes of Modern Iceland.

### **The Impact of the Gaelic Revival Movement on Modern Irish Culture**

**Nia Fortier and Nicole Fortier**

**Mentor: Susanne Fox**

This power point presentation is an outgrowth of a weeklong travel portion of the Irish History and Culture class to Ireland. Since the Gaelic Revival Movement of the late 19th century, the Irish people have been asserting their own history and culture, as a separate entity from that of

the British. The Gaelic perspective of history will be discussed through the study of old Irish or Gaelic cultural observations and holidays.

### **United States Influence on Syrian Civil War**

**Kira Tieman**

**Mentor: Cynthia Newton**

The purpose of studying the history of Syria is to understand why the civil war is in progress today. Researching historical and current events surrounding the current Syrian civil war, and analyzing the experts' positions, will help me to determine the United States influence on the civil war based on analytical data that I will collect, as well what the potential outcomes of the conflict may be.

### **From Geronimo Pratt to H. Rap Brown**

**Terrance Wingate**

**Mentor: Jessica James**

An in-depth look at the progress African Americans made during the Black Power Movement in the 1950s and early 1960s, led by young men and woman who rejected the nonviolent approach of Dr. Martin Luther King, when African Americans were attempting to gain their Civil Rights. This will compare and contrast two high ranking Black Panther Party Members, Geronimo Pratt and H. Rap Brown, both highly influential during the peak of this movement against injustice.

### **How the Tablet Industry is Changing Business and Society**

**Devan Bartell, Michael Chiedi, Hannah Martin, and Anthony Tagliaferro**

**Mentor: Kathleen Jacobs**

Tablets have been the newest innovation in technology over the past few years and have become a phenomenon. We explored the background, growth, and impact of the tablet through the internet and readings. We found that the tablet has not only revolutionized society but the business world as well. Over the past few years, the tablet has been integrated into the workplace and is now being used as the primary device for conducting business. Businesses are incorporating tablets into the workplace not just because it is trendy, but because of the numerous benefits the use of tablets provides. The tablet is allowing businesses to have a portable device that has superior functionality and information at the touch of your fingertip. Through the research, we conclude that the tablet is here to stay and will continue to revolutionize the workplace.

### **A Look Into Creating a Wesley College App for Smartphones**

**Karen Wearden and Sean Hopkins**

**Mentor: Yu Tian**

The WESLEY APP will be a combination of a Facebook Twitter Linked-In calendar that will enhance communication on and off campus. The App allows personalized colors, themes, and allows users to chat with friends, coworkers, and groups involved on campus. A floor plan will be presented in PowerPoint of what the App face will look like. With more research, I would like to look further into statistics and coding costs. Additional functions include a user-friendly switch accounts access where teachers can link directly to a personal account where they can talk to other faculty and staff on campus with the same functions above or stay with their teaching classroom account to talk directly to students. For those who are not tech savvy, a desktop

version of this app will be created for the upmost convenience to create elite communication on campus for everyone who uses the Wesley App.

### **Empowerment: Self-advocacy in the Management of a Cancer Diagnosis**

**Andrea Forsyth**

**Mentor: Judith Strasser**

The demand for quality cancer care is on the rise due to the complexity of treatment options and the disease itself. Furthermore, the number of people over the age of 65 continues to increase creating an even greater demand for cancer care as this group makes up the majority of all cancer cases. In addition, often the patient does not understand the treatment or the impact treatment will have on his or her future health. The current health care environment dictates the need for patient self-advocacy. Empowerment in the face of a cancer diagnosis encourages the patient to maintain control of his or her journey. Empowerment is a fundamental process that involves the participants in problem formation and decision making action. In light of an over-burdened cancer care system, advanced-practice nurses are instrumental in teaching self-advocacy. Research of scholarly literature was performed to support the conclusions of the poster.

### **College Students and “Grit”: An Investigation of the Relationships Among Impulsivity, Academic Self-Efficacy, Efficacy for Self-Regulated Learning, and Mindsets**

**Chris Fucetola**

**Mentor: Elizabeth Siemanowski**

Grit, according to Duckworth (2007), is an individual’s perseverance and passion to achieve long-term goals. Grit appears to be a trait associated with success in life. The factors investigated in this study are Grit scores, GPA, Self-Regulated Learning, Impulsivity, and Mindset type. Participants in the study were 75 Wesley College students. Students were asked to report basic demographic information and complete a series of questionnaires. It is hypothesized that learning self-efficacy, growth mindset, and GPA will be positively correlated with students’ Grit scores. A negative correlation is predicted for impulsivity and Grit score.

### **The Impact of Chronic Pain on Family Dynamics**

**Rebecca Martin**

**Mentor: Nancy Rubino**

Chronic pain is the leading cause of disability in the United States afflicting approximately 100 million people. It is not only devastating to the individual patient but can have a tremendous effect on family relationships (Silver, 2004) as well as all aspects of family life (McKenry & Price, 2000). Along with physical impairments, chronic pain brings emotional, social, relational and socioeconomic problems (Silver, 2004). Family dynamics change due to loss of income, disruption of normal family functions and role reversals. This project describes a synthesis of evidence to support strategies for long-term management of chronic pain which places the clinical nurse specialist in a lead role for coordinating a treatment plan. Evidence supported that treatment should focus on five goals: to reduce pain, restore/improve function, develop self-help and maintenance skills, improve depression and anxiety, and improve relationship with family/friend/health care professional (Middleton, 2004).

### **#Save The Wetlands**

**Brandon Reynolds and Christopher Gendreau**

**Mentor: Stephanie Stotts**

Almost 50% of Delaware's wetlands have been lost. Unfortunately, the general public tends to have misperceptions about wetlands. This project examines the practical and environmental values of wetlands, including the ecological and economic approaches. Wetlands provide flood protections, habitats for wildlife, Storm buffers, and Water filtration. The purpose of this project is to educate people on why wetland environments are imperative to the existence of the wildlife, humans, and plant life.

### **“I Control My Own Destiny”: An Analysis of Professionalism Levels of College Students in Relation to Self- Control and Self- Regulation Levels**

**Janel McCray**

**Mentor: Elizabeth Siemanowski**

The objective of this investigation is to measure professionalism, self-control, and self-determination levels of college students. The factors investigated in this study focus directly on self-report measures of student behaviors, motives, and understandings of what it is to be a professional. The current study is designed to measure students' levels of professionalism by measuring participants' classroom practices such as tardiness/attendance, attire/hygiene, and behavior and their level of self-control and self-determination. This study will use the following measurement tools: an abbreviated professionalism survey derived from a questionnaire designed by the Center for Professional Excellence of York College in Pennsylvania, the Brief Self-Control Scale (Tangney, Baumeister & Boone, 2004), and the Self-Determination Scale (Deci & Ryan, 2011). It is hypothesized that participants with high levels of self-control and self-determination will report more professional characteristics, indicating a higher level of professionalism.

### **Child Life Development**

**Brenda Hollingsworth, Danielle Tearl, Beth Mooshegian, Megan Aiello, and Madison Saunders**

**Mentor: Nancy Rubino**

Child Life Programs help patients and families cope with medical treatments, diagnosis, and hospitalization through play, preparation, education and self-expression for the child and families. During the Fall 2013 semester, our senior nursing class did a rotation on the Pediatric floor at a community hospital where we observed the absence of a child life department. To research this further, we visited a nationally renowned hospital to evaluate their overall Child Life Program. A quality improvement project (root cause analysis) was conducted using problem and solution fishbone diagrams. Data about outcomes of care for the hospitalized pediatric population with a child life program was used to design a hospital environment to improve the quality and safety of care for hospitalized children. During this evidence based quality improvement project, we discovered how pertinent the program and the use of a Child Life Specialist is to children who are diagnosed with illness, or needed confirmation and reassurance of treatments.

## **A Comparison of the Rates of Solvolysis of 3-Chloropropyl Chloroformate at 25.0 Celsius and 32.0 Celsius**

**Ross Beauchamp**

**Mentor: Malcolm D'Souza**

Commonly acknowledged as a tear gas, 3-chloropropyl Chloroformate is a lachrymator. In medical chemistry, 3-chloropropyl Chloroformate plays an essential role in the synthesis of anti-inflammatory drugs. In this undergraduate research project the solvolysis of 3-chloropropyl Chloroformate is studied in ethanol, methanol, acetone, 2,2,2-trifluoroethanol, and 1,1,1,3,3,3-hexafluoro-2-propanol at two different temperatures. When completed, the data will provide the necessary thermodynamic parameters needed to estimate charge development in the 3-chloropropyl Chloroformate transition state. Such results when published, will allow pharmaceutical companies to build on this basic knowledge to design and develop a more effective pro-drug product with 3-chloropropyl Chloroformate.

## **The Effect of Hunting on Population Dynamics of Delaware wild turkeys**

**Ashley Harmon**

**Mentor: Kathleen Curran**

In Delaware the wild turkey was once extinct but the Eastern wild turkey has been reestablished along with the turkey hunting season. This study hypothesizes that more juveniles were harvested than adults because juveniles would be more susceptible to the hunters call. That data does not support the hypotheses and more adults were harvested than juveniles. The data used is from the 2012 Delaware wild turkey hunting season. From the data it was found that 74.10% of the harvested turkeys were identified as adults. When further analysis was done on the weights of the turkeys harvested it was found that 66.61% were over 18lbs. Male Eastern wild turkeys as adults should weigh around 20lbs. Hunting for phenotypically desirable traits can cause human induced evolution which can cause consequences for the wild population. This study is important in determining a change in population dynamics for wild turkeys due to hunting.

## **Analysis of 3-Chloropropyl Chloroformate in Methanol, EtOH-TFE, TFE, and HFIP Mixtures**

**Maryeah T. Pavey**

**Mentor: Malcolm D'Souza**

The lachrymator 3-chloropropyl chloroformate is stable under normal temperature and conditions but reacts vigorously in the presence of metal salts. It has found synthetic use as an anti-inflammatory drug intermediate in medicinal chemistry. Studies of the alcoholysis of 3-chloropropyl chloroformate in aqueous methanol (MeOH), aqueous ethanol (EtOH), aqueous 2,2,2-trifluoroethanol (TFE), aqueous 1,1,1,3,3,3-Hexafluoro-2-propanol (HFIP), and TFE-EtOH mixtures are presented. The rates of alcoholysis of 3-chloropropyl chloroformate increases with the increase in water content in the aqueous alcohol mixtures. Results from this project will provide useful information for efficient future synthetic methodology.

## **Wesley College Efforts During National Chemistry Week**

**Kyle Gillespie**

**Mentor: Malcolm D'Souza**

As a part of a community outreach program, undergraduates in the Wesley College science program participated in an event to inspire kids to think about chemistry, and for kids to

understand the elementary principles behind that chemistry. To demonstrate how chemistry is involved in the everyday life of students, a variety of experiments were used as a way to pique students' interest, this varied from using hand boilers, to help illustrate how even the thermal energy released from a student's hand can affect the chemistry of a system. Other experiments also depicted how energy interacted in the environment and in chemical reactions. These experiments included using heat sensitive paper to make bookmarks, and using specially designed balls to exhibit electricity. A popular experiment was using UV light sensitive beads to demonstrate how energy can be transferred through light even when one cannot see the light. This not only a learning experience elementary students, but also helped undergraduate students learn the importance of educating the next generation while getting involved with the local community.

### **Enzymology**

**Wendi Clark**

**Mentor: Malcolm D'Souza**

Enzymology is the branch of science dealing with the activity and biochemical nature of enzymes. Enzymes are proteins acting as catalysts to speed up or slow down reactions. Enzymes play roles in metabolic and cellular signaling pathways. Enzymology is the most vital component of bioorganic chemistry. This field is also the main focus of the newly recognized field of chemical biology. In the past, enzymology gave scientists background knowledge to research uncharacterized reactions. These studies provided the foundation to compare uncatalyzed/catalyzed reaction mechanisms. This process began twenty-five years ago analyzing RNA. The dissection of RNA catalysts gave insight into the fundamentals of biological catalysis and opened the door for nucleic acids. Early in the twenty-first century, the areas of systems biology and chemical biology merged to complement both fields of study. The objective will be the challenge of integrating past framework with new ideas to evolve science.

### **Bioremediation and Biodegradation**

**Tabitha Lambert**

**Mentor: Malcolm D'Souza**

Pesticides and herbicides both contain harmful chemicals that leak into the soil where it is applied. Those harmful chemicals could be maintained, but could still soak into the water table. The contamination of ground water sends the toxic chemicals into residential areas which would lead to a serious environmental problem. In these studies, bioremediation has been used and shown to be effective. Decontamination and detoxification of a pesticide-contaminated environment is discussed especially considering the factors affecting the biodegradability of pesticides such as biological factors and the characteristics of the chemical compounds. (Gavrilescu) Bioremediation is effective to be used up to a year after one contamination, after each time a pesticide is release into the environment a test needs to occur. Strong correlations have shown activity and chemical processes that occurred during bioremediation in soils.

### **Lipid Profiling: An Important Test in Medicine**

**Jasbir Deol**

**Mentor: Malcolm D'Souza**

Lipids are biological molecules that are soluble in organic solvents but insoluble in aqueous solutions. They have several major functions including providing a reserve of energy through the form of triacylglycerols as well as serving as biologically active molecules. Lipids can be useful

in predicting increased risk factors associated with various diseases. There are medical tests that have been designed for lipid profiling, which serve to distinguish certain plasma lipids that are linked to increased risk for various disease. Multiple studies have been conducted in determining the particular lipid biomarkers that should be included in lipid profiling for cardiovascular disease, coronary artery disease, and diabetes. These studies have assembled the data required to link a particular lipid biomarker with an increased risk in these diseases. This presentation explores how lipid profiling has potential to become an asset in determining those with high risk attributes through the assessment of lipid biomarkers

### **Identification of *Escherichia coli* Strains Derived from the St. Jones River**

**Brett M. Sansbury**

**Mentor: Jonathan Kidd**

This project served to analyze water samples taken from the St. Jones River looking specifically to find bacterial populations of *Escherichia coli* (*E. coli*). Influences such as temperature and rainfall were analyzed to understand the affects they had on bacterial viability. The cell phenotyping BioLog instrument will be used for the identification of *E. coli* isolated from environmental samples for the duration of the study and will make the analysis of such data available in digital format. With the identification of the isolated bacteria, it will be possible to compare growth trends derived from differing geographical origin. Also, by identifying these organisms down to the species level a variety of strains of *E. coli* can be identified and included in data analysis to increase data confidence and study impact.

### **The Benefits of Sponsorship; Who Reaps More the Sponsor or the Organization?**

**Jasmine L. Belcher**

**Mentor: Diane Stetina**

In professional sports the word sport transforms from a hobby to a business. In this business cutting cost is major and the easiest way to cut cost is through sponsorship. Within the Arena Football League, sponsorship is what keeps the league in motion. Being that teams are responsible for feeding the players lunch and dinner throughout the season, trading sponsorships are a huge help in cutting cost. While working with one team in specific I did some research on their past partners and as well as their current partners for the upcoming 2014 season and realized that not many have returned. With this information it allowed me to conduct my research on trading sponsorships; how they benefit the sponsor and what can be done differently that will transform these temporary partnerships into long-term partnerships. The objective of this study is to evaluate and improve the retention rate of sponsors.

### **Disseminating STEM Student Research Outcomes on Dynamic Webpages**

**Catherine Gross**

**Mentor: Malcolm D'Souza**

The IDeANetworks of Biomedical Research Excellence (INBRE) program funded by the National Institute of General Medical Science at the National Institutes of Health (NIH-NIGMS) focuses on building biomedical research capacity. The Experimental Program to Stimulate Research (EPSCoR) is from the National Science Foundation (NSF) whose goals include engaging science in the global competitive market and is focused on building competitive research teams and starting new STEM initiatives.

At Delaware's (DE) Wesley College (Wesley), a private baccalaureate minority-serving institution (MSI) in the liberal arts, the DE-INBRE program was instrumental in growing its

diverse STEM undergraduate research capacity by giving students an opportunity to participate in closely mentored research projects (Directed Research) during the academic year and during full-time summer internships. The Delaware EPSCoR grant is helping the college infuse undergraduate research into the Core curriculum, expand undergraduate research in STEM areas, and is contributing towards a variety of retention initiatives.

### **Solvolytic Studies of Cyclohexyl Chloroformate**

**Laura Malinowski and Catherine Gross**

**Mentor: Malcolm D'Souza**

Chloroformate esters have wide commercial use as intermediates in pesticides, medicines, food preservatives, and other related chemical products. The steroid industry uses cyclohexyl chloroformate in the production of hydroxylated steroids. In this undergraduate research project the specific rates of solvolysis of cyclohexyl chloroformate have been measured in several pure and binary aqueous organic solvents, including in some fluoroalcohol mixtures. The kinetic rates of this cyclic chloroformate were obtained using acid-base titrations with lacmoid as an indicator.

### **Is Sea-level Rise Reflected in the Annual Rings of Marsh Fringing Trees?**

**Brooke Thompson**

**Mentor: Stephanie Stotts**

In this study, I present a pilot project regarding the use of annual tree rings to gather information about sea-level rise. I collected cores with an increment borer from three trees fringing the marsh at the St. Jones Reserve and sanded them to reveal the annual rings. After measuring the width of each ring and correcting the widths for narrowing due to growth, I will examine the ring width data for changes that may be associated with inundation or salt stress. If this pilot is successful, I will investigate the use of annual tree analysis as an indicator of soil salinization and sea-level rise.

### **Studying Brewer's Yeast Metabolism Using BioLog**

**Gabriel Alejandro Fernandez Bueno**

**Mentor: Jonathan Kidd**

Brewing, whether it be commercial or home, has become an industrialized art form over the last few decades as we have figured out the unique biochemical pathways that allows for the production of various beverages, liqueurs, and medicines using *Saccharomyces cerevisiae*. In order to determine the specific substrates that yeast are able to metabolize, a description of the activity of these cells over a time period is required. BioLog, a fully automated microplate reader delivers an analysis of each yeast cell solution in wells that allows a calculation of the activity of the yeast in each substrate over time. They also need to be compared to one another across the four different strains of Ale, Belgian, Lager, Weizen, and a commercial strain. Seeing if there are any similarities, we could get an insight into their respective metabolic activity. By studying them we can get an even better understanding of how they perform their metabolic functions and hopefully translate that back to the brewery

## **Jeffrey MacDonald: Guilty or Innocent?**

**Rachel Kurtz**

**Mentor: Charlisa Edelin**

This case was important because it was one of the most riveting and baffling cases of the 1970s. Jeffrey MacDonald was convicted of killing his wife and two daughters on a military base in North Carolina. MacDonald was a military surgeon and had no previous criminal record. This case drew National attention because of the nature of his conviction. MacDonald was convicted 9 years after the crimes were committed. He is still appealing his case today, 39 years later, and steadfastly maintains his innocence. Research for this topic was conducted through the use of primary sources, including but not limited to, newspapers, books, and articles. The objective of this research was to determine whether or not the courts correctly convicted MacDonald or if there is enough evidence to prove his innocence.

## **Origins of Life: Experiments in Molecular Self-Replication and Directed Evolution**

**Karri-Jo E. Walls**

**Mentor: Malcolm D'Souza**

The ability to replicate is an essential component of evolvable life, yet how replication emerged during the origin of life remains an unanswered question. The experimental approach to this subject focuses mainly on a molecule's ability to catalyze its own formation from a set of precursors using both biological and non-biological molecules. The purpose of this study is to discuss and compare the methodology and results from recent experiments in molecular self-replication and directed evolution.

## **BMI, Impedance and Caliper Test for Comparison of Body Fat**

**Catherine Gross**

**Mentors: Malcolm D'Souza and Lynn Everett**

The Center for Disease Control and Prevention reports that over one-third of adults in the United States are obese. A recent study of the Wesley College student population indicated 29.5% of students are overweight and 19.8% are obese. It is alarming when one realizes that almost 50% of the student population is overweight based on a Body Mass Index (BMI) of over 29, which is above the Delaware reported average of 26.9%. Obesity causes many health related issues such as Type 2 diabetes, hypertension, and heart disease. Observations at Wesley College indicate a 50% overweight population is unlikely. To verify this we will compare BMI to actual body-fat measurements using self-reported height and weight to two different body-fat composition tests (caliper test and bioelectric impedance) conducted during Anatomy and Physiology II lab. Statistical analysis of this data will show the correlation of obese BMI ratings to lab measurements of body-fat tests.

## **Solvolysis of Diallylcarbamyl Chloride**

**Kyle Gillespie**

**Mentor: Malcolm D'Souza**

Diallylcarbamyl chloride has found use in patented herbicidal applications of novel tetrazolinones and as a useful precursor in the formation of many pharmaceutically useful inhibiting compounds. The specific rates of solvolysis of diallylcarbamyl chloride were determined at 25.0°C in solvents of varying nucleophilicity and ionizing power. In this presentation we will also compare the pseudo first order rates obtained for diallylcarbamyl chloride to those obtained for

the previously studied alkyl and aryl carbamoyl chlorides. We will show that the mesomeric effect of the allyl groups in  $R_2NCOCl$  dominate the rates of reaction.

### **Kinetics of Yeast in Beer**

**Maryeah T. Pavey**

**Mentor: Jonathan Kidd**

The reason that beer contains alcohol is because of a biochemical process called fermentation, which converts glucose into ethanol and carbon dioxide. This process is done in part by an enzyme alcohol dehydrogenase. There are four different kinds of yeast being studied in this kinetic study. By doing an enzyme assay on alcohol dehydrogenase it will help to show the rate that ethanol and carbon dioxide are being made by the enzyme ADH. Knowing the different kinetic rates of ADH will help to allow for a comparison of the different yeast that are used to make different beers.

### **The Distribution of the Lone Star Tick, Amblyoma americanum, and the Disease Human Monocytic Ehrlichiosis in the State of Delaware**

**Amber Wiltbank**

**Mentor: Kathleen Curran**

*Amblyoma americanum*, the Lone Star tick, is distributed throughout the eastern half of the United States. The female ticks are known for their distinct characterization of the white spot on their backs, the source for their common name. Although the ticks were thought to be merely a nuisance in the very early years following their discovery, it has now been demonstrated that these ticks are important vectors of several disease affecting humans. One of these, Human Monocytic Ehrlichiosis (HME), causes fever, headache, constitutional symptoms and occasionally death. For this proposed study Lone star ticks will be collected from state parks in Delaware using drag cloths and the gut contents will be analyzed using pcr for the presence of the causative agent of HME. The results will indicate where within the state this disease occurs, and how prevalent.

### **California Bay Country**

**Samantha Mahoski and Kourtney Lake**

**Mentor: Susanne Fox**

In the fall of 2013, the History Department traveled to California, exploring the cities of San Francisco, Santa Cruz, Monterrey, and the Napa and Sonoma Valleys. With this oral presentation, the history and culture of the West Coast will be analyzed as well as a brief description of what we learned on the trip itself. Using a power point presentation, we will show the similarities and differences between each bay “country” visited and provide insight into the diverse culture of California.

### **Broad to Haight : A Students Guide from East to West but Nothing in Between!**

**Frederic Sottnick and Julian Borris**

**Mentor: Susanne Fox**

“From Broad Street to “Haight-Ashbury” is a step by step documentary-like presentation which takes students from Philadelphia to San Francisco. Fred Sottnick and Julian Borris worked on a final PowerPoint presentation following the trip to San Francisco. The project gave the audience

a day by day analysis of our journey in San Francisco, San Simeon, and other areas the class toured. The students visited various historical sites such as Coit Tower, The Piers, Hearst Castle, Wine Country, and various Spanish Missions where much of California's history began. This presented the students with not only the history of these fascinating locations, but of their importance in contemporary society and their subsequent effect on American culture (which is tremendous). The presentation for founder's day will not only give a virtual tour of the class' adventures, but it will also compare the differences between a west coast city like San Francisco to a major east coast city like Philadelphia.

### **Writing Codes for Computer Assisted Instruction**

**Riza C. Bautista**

**Mentor: Agashi Nwogbaga**

In this work, we examine computer assisted instruction (CAI) and its historical and contemporary relevance. Ultimately, we will also design and write actual computer programming codes for providing CAI in Mathematics, and explain how they can be adapted in sciences, and other disciplines. Computer assisted instruction is simply the provision of educational instruction with the help of a computer. CAI can be used to provide full-scale automated instructional delivery, or to simply provide tutorial help to reinforce or clarify new skill. With smartphones, tablets, and laptops nearly ubiquitous, and computer prices decreasing, computers and CAI are becoming more common both within and outside the classroom. To create a CAI system, computer programmers write complex codes that serve as the CAI driving force.

### **The Collaboration Between Media Arts and the New First Year Seminar**

**Danielle Reid, Jennifer Holland, Dylan Cochran and Derrick Schleich**

**Mentor: Jessica James**

This presentation focuses on the partnership between the Media Arts Video Production class and the Hungry for Change, Living Learning Community (Fit-to-Serve). As part of Dr. Mike Nielsen's Video Production course, we paired with Dr. James first year seminar to create public service announcements. I helped four of the students create a PSA for the Delaware Food Bank, whom they also partnered with to hold a mobile food pantry in November. Additionally, I produced a documentary about the Fit-to-Serve Living Learning Community. The footage for my documentary was obtained through attending the various activities and events the first year students were engaged in, interviewing members of the LLC and the professor, and filming, editing and producing a final result. This presentation will discuss the collaboration and then show the documentary and the resulting PSA.

### **Cincinnati v. Mapplethorpe**

**Isnara St. Phard**

**Mentor: Charlisa Edelin**

This case was important because it defined what obscenity is. This case determined whether or not a person's First Amendment right should be limited. This case drew national attention because the sensationalism of this case and changes that courts made to law of what was unconstitutional. Research for this topic was conducted through the use of primary sources, including but not limited to, newspapers and books. The objectives of this research was to determine if photography as well as other forms of media could be limited though having a First Amendment right to freedom of press, speech, etc.

**Hip-Hop on Trial: The case against Lil Kim**  
**Tamisha Thomas**

**Mentor: Charlisa Edelin**

This research will focus on the *U.S. v. Kimberly Jones* case. This case was important because the rapper Kimberly Jones, also known as "Lil Kim," was convicted of two counts of perjury for allegedly lying under oath about a shooting she witnessed. This case received national attention because although Lil Kim was not a shooter, she was a controversial member of the "violent" hip-hop culture. This case questioned the fairness of bringing a case against the non-shooter simply because she produced violent and vulgar music. Research for this case was gathered through the legal search engine LEXIS, scholarly journals, and newspapers. The objective of this research is to dictate whether or not the prosecution of Lil Kim was justifiable or whether the legal system simply wanted to make an example of her.

**The Whetstone Goes Multimedia: How Multimedia Packages are Conceived and Produced for the Web**

**Brian Baker and Warren Gross**

**Mentors: Tery Griffin and Victor Greto**

In this presentation, students will show multimedia story packages they've developed. They'll explain the reasoning behind the packages and the process of developing each one

**It's Elementary, My Dear Watson: Unraveling the Mystery of Thesis Statements in Peer Tutoring**

**Erin Bifferato**

**Mentor: Jessica Pilewski**

The thesis statement is often a mystery for many students. Students many not understand the purpose of the thesis statement or they simply not have uncovered where their paper is going. Students also do not realize that in drafting their paper, they have already written the clues for themselves. The one on one nature of talking tutee through the process of the thesis statement is beneficial to help solve their own mysteries, while modeling a pattern for future enigmas.

**Changes in Sea Level Rise and how they affect Riparian Buffer Zones in the Broadkill Watershed**

**Kyle Frame**

**Mentor: Stephanie Stotts**

The Broadkill River has experienced recent sea-level rise, a trend that is predicted to continue. Increased water levels may threaten already diminished riparian buffer zones within the watershed region. Riparian zones are important because they filter pollutants and prevent erosion. The goal of this project is to predict riparian zone destruction under different sea-level rise scenarios. To accomplish this goal I will digitize the existing riparian buffer zone of the Broadkill River using GIS (Geographic Information Systems). This layer will be intersected with sea level rise scenarios provided by DNREC (Department of Natural Resources and Environmental Control). The resulting layer will pinpoint areas in the existing riparian buffer zones that may need expansion. I will be developing this research through an internship with DNREC Coastal Programs Office.

## **Making the Grey Fox, Weasel, and Skunk a Game Species in Delaware**

**Alex Niezgoda**

**Mentor: Kathleen Curran**

Research supported ideas suggesting the introduction of three species (grey fox, weasel, and skunk) as game species in the state of Delaware.

## **1920s: Prosperity and Panic**

**Caitlin Chaney**

**Mentor: Susanne Fox**

This power point presentation examines the juxtaposition of the booming American economy and the decadence of the 1920s. The underlying threads of intolerance, consumerism, racism and women's rights are analyzed as factors woven into the fabric of the American social climate of the period.

## **Sicily Diversity Background**

**Valarie Shorter**

**Mentor: Frank Gregory**

The History and Culture of Sicily class travelled to Sicily in summer 2013 after four intensive weeks of classroom instruction. This presentation will discuss the eight main periods of foreign domination over Sicily and their modern day consequences. Power point slides will depict the long history of Sicily and how the mixture of the Normans, Muslims, etc. influenced the island's history, culture and cuisine.

## **Asthma in College Students: Coping & Compliance**

**Taylor R. Harvey**

**Mentor: Barbara Abbott**

The purpose of this study is to determine the effects of asthma on college age students. Based on my experiences through literature and course work, I believe that there are a significant number of college age students that have asthma, either diagnosed, perceived or both. Before entering college, often a guardian plays a role in reducing asthmatic episodes by helping reduce exposure to triggers; once a student leaves for college, they become responsible for prevention measures. I believe that the majority of these students are not making the proper concessions and lifestyle changes necessary to maintain control and prevent asthmatic episodes. Students will be given an anonymous survey to gather information about the severity, control, frequency and concessions made in regards to their asthma. This research will evolve to help determine the asthmatic standing of students at a small, northwestern college and work as a catalyst to provide programming for students to learn about better managing their asthma.

## **The Relationship between Facility-Related Factors and Client Performance**

**Charlesha A. Harris**

**Mentor: Barbara Abbott**

Self-Determination and intrinsic motivation are both very important themes as it relates to sport and exercise. More specifically, these themes are affected by external influences although they are both internally driven phenomena. This study is to determine how facility related environmental factors such as weather and season, other clients and professionals in the facility and the professional's attitude toward the client directly influence their performance. I have created a Client Tracker that will be used to document the external conditions we are measuring. No variable in this study is being manipulated, therefore the subjects are not required to complete

a preliminary survey or questionnaire as this could potentially affect client attitude thus skewing the data collection.

**Madness in Me: The Insanity of John du Pont the Wealthiest Murder Defendant  
John Jackson**

**Mentor: Charlisa Edelin**

The importance of this case was that it placed a national spotlight on the insanity defense. This PowerPoint presentation will explain the trial of the wealthiest murder defendant, John du Pont and his use or mis-use of the insanity defense. Using primary sources, including but not limited to, newspaper articles and books written by eyewitnesses, this report explores the life of du Pont leading up to the murder, his trial and death. The objectives of this research is to determine whether du Pont was actually insane or not and whether the courts made a proper determination regarding his sanity.

**The Story of Amy Grossberg and Brian Peterson  
Sherleen Sabin**

**Mentor: Charlisa Edelin**

Amy Grossberg and Brian Peterson, two middle class white college kids, were charged with murder in the first degree of their newborn baby on November 17, 1996 in Newark, Delaware. Grossberg and Peterson managed to keep the pregnancy a secret from their parents, physicians, and friends. Neonaticide, the killing of a newborn in the first twenty-four hours of life, are solely committed by mothers who are unwed, poor, or feebleminded. This case is a unique profile of neonaticidal mothers, since Amy Grossberg did not fit this profile; and the father was involved in the killing. The objective is to discuss the matter of racial issues concerning the Attorney General for Delaware decision to seek the death penalty as well. Their earlier life to post sentence is described based on official court documents and transcripts of interviews. Though the facts are provided, they are disputed and cannot be verified because the only people that know what really happened were Amy Grossberg and Brian Peterson.

**Creation of a Smartphone App for Common Pesticides Used in Delaware  
Benjamin Barile**

**Mentor: Malcolm D'Souza and Frank Fiedler**

Approximately 42 percent of Delaware is used for agriculture. In order to manage pests, such as insects, weeds, nematodes, and rodents, pesticides are used profusely to biologically control the normal pest's life stage. A pervasive problem of their extensive use is their widespread harmful impact on the environment, the economy, and on human health. In this project, we first created a database containing 62 pesticides that are commonly used in the State of Delaware. This database contains the pesticide structure, IUPAC name, log Kow (octanol-water partition coefficient), water solubility data, and was created using a commercial platform called KnowItAll®. Next, we extracted the pesticide data out of the KnowItAll® informatics system and created the additional uses and safety information sections. Finally, we developed a mobile application for smartphones displaying the pesticide database using Appery.io; a cloud-based HTML5, jQuery Mobile and Hybrid Mobile app builder.

## **Regression: Basic Statistical Tool in Chemometrics**

**Jasbir Deol**

**Mentor: Malcolm D'Souza**

In this undergraduate research project, we analyzed the solvolytic rates of the reaction of 4,5-dimethoxy-2-nitrobenzyl chloroformate and  $\alpha$ -chloro-2(trifluoromethyl)benzyl chloroformate in a variety of organic solvents with widely varying nucleophilicity and ionizing power values. We used a similarity model approach to analyze quantitative data to determine the mechanism of reaction. Our observations incorporating kinetic data in several fluoroalcohol-containing mixtures are rationalized in terms of the reaction being sensitive to substituent effects and the mechanism of reaction involving the addition (association) step of an addition-elimination (association-dissociation) pathway being rate-determining.

Research reported in this poster was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number P20GM12345.

## **Hypoxia Induced Metabolic Changes in Cancer Cells**

**Catherine Gross**

**Mentor: Malcolm D'Souza**

Hypoxia, the decreased availability of oxygen, is a common feature in tumors, "which increases patient treatment resistance and favors tumor progression" (Horn). The inner cells of a solid tumor are deprived of oxygen as the outer cells near healthy tissues has an adequate supply of O<sub>2</sub>. As tumors grow, it slowly outgrows the oxygen supply in the localized area, causing the tumors metabolism to change. Due to the lack of O<sub>2</sub>, Oxidative Phosphorylation switches to altered glycolysis, which produces lactate acid. The increase of lactate acid decreases the amount of cytotoxic T cells released in the area of the tumor. Most anticancer therapies rely on the overproduction of reactive oxygen species to cause instability in the genes of the cancerous cells, increasing the resistance to cancer treatments including chemotherapy and ionizing radiation.

## **Importance of Carotenoids, Anthocyanin and Vitamins to the Human Body**

**Doris Kwame**

**Mentor: Malcolm D'Souza**

The purpose of this study is to identify the importance of carotenoid, anthocyanin and vitamins to the human body. Carotenoid, anthocyanin and vitamins are all necessary for the normal health and growth of the human body. They play a major role when it comes to the health of the body. Carotenoids are colorful pigment that are found in fruits and vegetable that when consume act as an antioxidant to prevent illness such as cancer, heart disease and eye diseases. Anthocyanin on the other hand is a flavonoid that also acts as antioxidant which aid as anti-inflammatory agent, and anti-viral and also aiding in prevention of cancer. Vitamin is an organic substance that acts as coenzyme which function is to assist particular enzyme in the body increase the rate of a chemical reaction. Carotenoids, anthocyanin and vitamin are very important for the body in maintaining good health.

## **Medical and Ethical Implications of Inexpensive Genome Sequencing**

**Maryeah T. Pavay**

**Mentor: Malcolm D'Souza**

Genome sequencing is actually having the capability to copy one person's entire DNA sequence. Genome sequencing can allow for a person to know every single thing that their genome will express such as diseases, disorders, or anything that can come from a genetic trait. In the past twenty years research has been done to be able to interpret the entire genome of one person. There has been some success but the more and more success that has come out of it the more possibilities have come out of it. Such as the more that it is done the cheaper that it has become; thus allowing for more and more people to be able to have genome sequencing done. With the genome sequencing growing; implications have come along because of it such as medical and ethical.

## **Beta Carotene & Anthocyanin: A Biochemical Analysis for the Consumer**

**Victor DeBarros, II**

**Mentor: Malcolm D'Souza**

Functional foods are foods that have been given biosynthesized active ingredients or more of its natural active ingredients in order to reduce risk of various non-transmittable diseases and/or promote health. The functional food that I will be conducting research on is Ipomoea Batatas; the sweet potato, which has been shown to reduce risks of cancer, high blood pressure, and abnormal cholesterol levels. Specifically, my research will be focused on the biochemical functionality of two biologically active compounds of the sweet potato: beta-carotene and anthocyanin. Both of these compounds have been analyzed in several clinical trials in order to determine their effects on the human body and have been observed in-vitro and in-vivo to determine its antioxidating mechanisms. Even though these functional foods have been shown to have positive effects, there are negative side effects that have emerged due to the biosynthesis of these compounds, which will be chiefly compared.

## **The Effects of Diet, Exercise, Stress and Genetics on Aging**

**Rachel Hausler**

**Mentor: Malcolm D'Souza**

Humans are constantly trying to find a way to escape the inevitable process of aging. Diet, exercise, stress and genetics all have roles in the aging process. A change in one of these areas could drastically affect the rate of aging. The research reviewed in this study used methods consisting of observational dietary data, the effects of different levels of quality of life, analysis of successful aging and having a high activity level, and the comparison of telomere length with the aging process. With the exception of genetics, people are able to make lifestyle changes to slow down the process of aging. In this study, research is reviewed on the biochemical effects of diet, exercise, stress and genetics on the aging process.

## **The Economics of Microarrays**

**Thoria Custis**

The newly developed microarray technology has made it possible to learn about every gene in an organism in one single experiment. Microarray allows the researcher to look at an entire genomes expression pattern. This is done by extracting mRNA from the target sample, and transcribing it into cDNA labeled with a fluorescent. The cDNA is applied to a microarray chip and binds to its complementary sequences on the chip. A laser is then used to activate the dyes,

and with the computer, it calculates the ratio of affected and unaffected samples. This technology is the answer to “is the gene being expressed?” as well as “how much is it being expressed?” The ultimate goal of this work is to create a standard for recording and reporting statistical methods for gene expression data analysis, and show not only the capabilities but the advantages in future medicine.

### **Centralized Database for Chloro- and Fluoro-formate Esters**

**Gabriel Alejandro Fernandez Bueno**

**Mentor: Malcolm D’Souza**

In this project, we create an Excel database where the esters have a central domain containing their information. The database includes their materials safety and data sheets (MSDS), CAS number, chemical structure, type of mechanism, PubChem ID (if available), and hyperlinks to their respective production websites. The database allows for a cleaner, quicker, and more efficient method of researching the current extensive list of chloro and fluoroformates. In future, as more information becomes available and as more of these compounds are created, the database can easily be expanded to accommodate this knowledge base.

### **The Positive and Negative Aspects of Food Additives**

**James M. Welsh**

**Mentor: Malcolm D’Souza**

Food additives are very common in frozen foods, baked goods, processed meats, among many other types of foods. The goal of my research was to determine whether food additives have positive and/or negative aspects by researching articles using techniques such as various assays, effect additivity, dose additivity, reviewing literature, providing intervention for patients with high serum phosphate levels, and flow cytometric basophil activation test; showing evidence that various food additives can have positive aspects while others can have negative aspects. Some of the positive aspects that were found through researching articles on this topic were that some food additives can act as antioxidants, therapeutics, and counteract oxidative stress. There were many articles on the negative aspects such as hypophosphatemia, cytotoxicity on neuroblastoma cells, and finally some have been found to be correlated to cases of chronic urticaria.

### **Treatment of Triple-Breast Cancer (TNBC): The Interplay of Cancer, Chemotherapy and DNA Repair**

**Angela Clemmons**

**Mentor: Malcolm D’Souza**

Approximately, 1 in 8 women will develop an invasive form of breast cancer in their lifetime. About 5-10% of those cases will be classified as a triple negative breast cancer. Genetic mutations in DNA repair genes, (BRCA1/2), cause tumor suppressor genes to become inactive. Chemotherapy treatments and other adjuvant therapies which will improve efficacy of post-surgical treatments motivate research. This paper will discuss a developing treatment option for TNBCs and its responses to PARP (poly ADP-ribose polymerase) inhibitors. The PARP enzyme is used to repair damaged DNA, including cancer cells. Inhibiting the PARP enzyme ultimately results in synthetic lethality –where a mutation in either of two genes individually has no effect but combining the mutations leads to death. Research including PARP inhibitors is essential to discovering the most efficient therapy for TNBCs. New treatments and/or recombination of existing treatments may significantly improve response rates to adjuvant therapies.

## **Carbohydrate Metabolism**

**Brett M. Sansbury**

**Mentor: Malcolm D'Souza**

Carbohydrates are an essential macronutrient in living organisms, contributing to biological processes such as sexual development, immune and circulatory health, and energy production in humans. Commonly consumed in the form of cereals, bread, pasta, and sweets, carbohydrates serve as structural components and complex energy storage that are metabolized to simple sugars for use as energy in biological reactions. The metabolism of carbohydrates relies heavily on pancreatic health, and two common health issues concerning carbohydrate metabolism in humans are diabetes and lactose intolerance. Furthermore, metabolic activity of carbohydrates is strongly involved in weight management of the human body and overall health. This project serves to overlook the importance of and various roles which carbohydrate metabolism plays in the human body by way of presenting appropriate research found on these subjects.

## **Understanding Reaction Pathways of Agrochemical Precursors**

**Brett M. Sansbury and Tabitha Lambert**

**Mentor: Malcolm D'Souza**

Choro- and chlorothionoformate esters are synthetically useful precursors in the commercial agrochemical industry as potential inhibitors of insect and plant growth. Prior analysis of solvolytic rate data for a variety of these esters showed the occurrence of simultaneous side-by-side addition-elimination and unimolecular  $SN1$  mechanisms that were dependent on the structure of the reacting substrate. In this undergraduate project we now focus on the study of the specific rates of solvolysis of 1-chloro-2-methyl propyl chloroformate and pentafluorophenyl chlorothionoformate in a number of solvents with different nucleophilicity and ionizing power values. For the two substrates analyzed, we show that the addition-elimination mechanism is the dominant channel in all of the solvents studied. Research reported in this poster was supported by an Institutional Development Award (IDeA) from the National Institute of General Medical Sciences of the National Institutes of Health under grant number P20GM12345 and the National Science Foundation EPSCoR Grant No. EPS-081425.

## **Meningitis Around Your Campus**

**Cierra Brown, Chelsie Rogers, Fritz Corneille, Quiana Nixon, Glenn Patrick Aruta, Ruth**

**Ann Elston and Ashten Bodofsky**

**Mentor: Fairuz Lutz**

Meningitis can be defined as a pathogen that is spread through the exchange of respiratory or throat secretions. Without proper preventative infection maintenance, a campus wide outbreak can certainly be seen as a realistic possibility. With our research on evidence-based practice, we will be able to educate students on proper preventative measures in order to maintain an utmost sanitary campus environment. The ultimate aim of our research is to present the signs and symptoms of this illness, along with ways to help facilitate proper prevention techniques. These techniques and measures, we hope, will help prevent the possibility of a future campus wide outbreak.

## **The Relationship Between Impervious Surfaces, Urban Runoff, and Freshwater Discharge- A Case Study of Dover, DE**

**Zakary Fisch**

**Mentor: William Kroen**

Impervious surfaces do not allow storm water to infiltrate soil, which then travels as runoff to nearby lakes and streams. Runoff, especially from cities, often contains contaminants such as oil, grease, and/or industrial chemicals. Many studies attest that storm water runoff is having negative impacts on freshwater ecosystems, such as eutrophication, or making the water toxic or even carcinogenic. First, this study shows that the amount of impervious surfaces has changed over time in St. Jones River watershed. Secondly, this study shows that stream discharge into the St. Jones River has been affected over the same period of time. Impervious surfaces in the St. Jones River watershed have increased by approximately 3.91% from 1968 to 2012. Responses in discharge due to precipitation data were inconclusive. Therefore, impervious surfaces have increased over time in Dover but it was not proven that impervious surfaces affects discharge into the river.

## **Correlation of BMI to Gender, Lifestyle Factors and Behaviors Of College Students**

**Karri-Jo E. Walls**

**Mentors: Malcolm J. D'Souza, Lynn E. Everett, and Derald E. Wentzien**

According to the American College Health Association, the percent of overweight (BMI: 25.0 - 29.9) and obese students increased from 27.4 percent in 2006 to 29.2 percent in 2011. In 2013, the American Medical Association classified obesity as a disease. Here we investigate the importance of gender, demographics, and other lifestyle factors and behaviors on BMI trends, and, we determine if college students follow the United States Department of Agriculture (USDA) guidelines for daily portions of fruit, vegetable, dairy, and protein. A 25-question paper-format survey was completed by 307 randomly chosen Wesley College students. Our results show that 48% of Wesley College students surveyed are overweight or obese, they also show that following USDA dietary recommendations can be an important factor in reducing the risk of obesity.

## **Biochemical Process of Major Diseases**

**Mouad Bekka**

**Mentor: Malcolm D'Souza**

The dysfunction of the human body through multiple types of diseases is rapidly increasing. the mitochondrial system for energy transduction is an exmaple of a biochemical process of a disease that can be caused by a genetic defect in a mitochondrial enzyme or translocator. more than 60 mitochondrial enzyme deficiencies have been reported. There are other types of defects that are caused by lack of special molecules to enable proper functioning or inhibit that function. Malnutrition, circulatory or hormonal dysfunctioning, virul infections, poisoning or metabolic errors outside the mitochondria.when the production of mitochondrial ATP decreases, secondary lesions of the mitochondria will be generated due to changes in the syntheis and degradation of mitochondrial phospholipids and proteins, to mitochondrial antibody formation followed by sever degradation. Accumulation of toxic products as excess acyl-CoA, to the depletion of Krebs cycle intermediates, and the increase of free radical formation and lipid peroxidation .

## **HIV Awareness and Prevention in the Nigerian Community in Delaware**

**Justina Okereh**

**Mentor: Nancy Rubino**

We have an increased rate of HIV nationwide, the Center for Disease Control recorded that more than 1.1 million people in the United States are living with HIV infection, with almost 18.1% being unaware of their infection. Between 1981 and 2011, 5,398 Delawareans were diagnosed with the HIV or AIDS infection. This disease can be prevented by adopting a healthy lifestyle, as well as grass root campaign through education. HIV awareness and prevention in the Nigerian Community in the State of Delaware was chosen as a topic for discussion because, Culture they say is the people's ways of life. The Nigerian culture does not place much emphasis on preventive healthcare/ treatment; therefore, the Nigerian people ignore this important part of healthcare practices. "The ability to embrace health and wellness is largely dependent on the cultural perceptions and health practices within the culture." (Edwards, 2004). Since HIV is a disease that could spread quickly without protection, a lot of people will become infected without knowing that they are a carrier due to ignorance.

## **A Calculus Based Approach to Estimate the Volume of Asteroids**

**Kasey Thompson**

**Mentor: Derald Wentzien**

The goal of this research was to develop a methodology to estimate the volume of asteroids. A document from the NASA Space Math webpage discussed how the disk method from calculus could be used to estimate the volume of a comet from a polynomial that specified the profile of the comet. This research focused on specifying good polynomials from pictures of the asteroids. Clear pictures, volumes, densities, and masses of asteroids were obtained. Pixel counts from MS Paint were used to determine a series of x-y coordinates. Matrix multiplication from Linear Algebra was used to rotate and/or translate the coordinates to place the origin at the first set of coordinates. Regression analysis was used to find good polynomials for eighteen of the asteroids. The eighteen R<sup>2</sup> values ranged from 0.9451 to 0.9989. Maple and Calculus was then used to estimate the volumes of the eighteen asteroids using the disk method.

## **Wildcat Landfill**

**Becara Dalton**

**Mentor: Stephanie Stotts**

I am conducting a historical background and analysis on the Wildcat Dump in Dover, DE, a superfund site, once on the national priorities list. I have been searching archives pertaining to the landfill, mainly the 5 year reviews from June 2012 and the prior from June 2007. As of late, I have been focusing on the specific contaminants found in leachate samples of ground and surface water, focusing on how much progress has been made since the initial discovery of the problem in 1979. Four five year reports have been conducted since remedial construction was completed in 1992.