The Effects of *Salvadora persica* (Miswak) on the formation of cavity forming biofilm *Streptococcus mutans*

Monique Salmon '14
Faculty mentor: Dr. Jill Callahan
Biology

The toothpick from which the chewing stick was derived has evolved to what is known worldwide as the modernized toothbrush. Nevertheless, in some areas of the eastern world the chewing stick is widely regarded as an affordable, readily available, and easily accessible means of dental hygiene. Whether its use is more cultural than clinical is still unknown. This research aims to investigate the effects of chewing sticks on cavity forming biofilms *Streptococcus mutans. Streptococcus mutans* is the plaque forming bacteria that lowers oral pH resulting in the erosion of tooth enamel. It adheres to the surface of the teeth and tongue and is most effective in its fifth formation stage where it undergoes a process called quasi-sensing. If left untreated over a period of time this break down may result in what is known as dental caries. Using the flat-bottom polystyrene microtiter plate to create an assay of biofilm formation, aqueous *Salvadora persica* (miswak) was added to a bacterial inoculated media at different concentrated levels. The data obtained through spectronomy revealed that miswak contains antimicrobial agents that inhibit the growth of cavity forming plaque. Although accepted as a mean or oral care by the World Health Organization it has not yet made an impressionable on the western world.

The anti-plaque analysis of green tea and soursop and examination of synergistic effects with cinnamic and caffeic acids on *Streptococcus mutans*

Molineros, Natia '14
Faculty mentor: Dr. Jill Callahan
Biology

Antibiotic resistance among microorganisms has become more prevalen recent years. It is therefore important to understand the effects these microorganisms have on the individual and to find alternative treatments their control. Cariogenic species *Streptococcus mutans* is among the ear colonizers existing on the tooth surface biofilm known as plaque. Within such protective biofilms, bacterial species are more resistant to antimicrobial agents than their planktonic counterparts. Recent studies have demonstrated that the consumption of green tea can lead to many health benefits, including fighting bacterial infections. Soursop, derived from the *Annona muricata* plant, has long been used as a natural remedy as it contains numerous bioactive compounds. This study sought to examine the effects of green tea and soursop on *S. mutans* biofilm formation and determine possible synergistic effects with caffeic and cinnamic acid. Developing biofilms of *S. mutans* were treated with green tea ± caffeic or cinnamic acid, and soursop ± caffeic or cinnamic acid. Biofilm formation was quantified using a standard crystal violet assay. Ou preliminary findings indicate, green tea and green tea ± caffeic or cinnam acid inhibit *S. mutans* biofilm formation. This project aims to examine natural treatments for dental caries and other biofilm infections.

Supported by a grant from the Tri-Beta Research Foundation.

Presented at the Tri-Beta NE-1 Research Convention at the College of Mount St. Vincent , April 26th, 2014

Healthy Baby Awareness Day/Nutrition Fair

Students of Bi 325, Topics in Anatomy and Physiology
Mentor: Dr. Laura Twersky

Posters on student research projects on development and nutrition topics, that were presented at the Healthy Baby Awareness Day/Nutrition Fair in Gannon Hall on April 10, 2014, will be displayed. Research topics include the fetal alcohol syndrome, gestational diabetes, and the effects of the Mediterranean diet on health.

Earth Day Festival/Nature Photography Contest

Mentors: Dr. Fran Raleigh and Dr. Laura Twersky, co-advisors of S.A.V.E. (Students Against Violating the Earth)
Biology

Photos entered in the nature photography contest, and exhibited at the Earth Day Festival on April 23, 2014, will be displayed. (Sponsored by S.A.V.E. (Students Against Violating the Earth)

Influence of Random Feedback on Repeated Standardized Test Performance

Sandesh Bhandari ’14
Faculty Mentor: Dr. Maryellen Hamilton
Psychology

The current experiment tested the effects of random feedback on repeate testing of standardized test materials (SAT vocabulary questions). This was done to see if a typical testing effect (increased performance with multiple tests) is obtained when the actual materials to be tested change and feedback is inconsistent. We attempted to clarify if performance on a standardized test can increase by mere exposure to the test procedure; regardless of feedback.

Effects of Opinion Agreement of Perceived Source Expertise

Sandesh Bhandari ’14
Faculty Mentor: Dr. Maryellen Hamilton
Psychology

The current experiment tested whether a source’s agreement with a person’s view on controversial topics has an effect on the person’s implic perception of the source’s expertise. The rate with which different source agree or disagree with the participants was manipulated to see if it produced biases about source expertise. It was found that people perceived the source that agreed with them as more of an expert than th source that disagreed.

Decreasing Blood Pressure: A program Targeting Medication Adherence and Healthy Lifestyle

Mary Ann Balut
Faculty Mentor: Dr. Corrine Ellis
Nursing

The purpose of this project is to review and analyze the literature to find the most current educational interventions that decrease blood pressure for patients diagnosed with hypertension. There is presently a worldwide epidemic of patients diagnosed with hypertension and millions of patients with associated disabling conditions such as kidney failure, stroke and heart failure. Additionally, there are 9 million global deaths occurring every year (World Health Organization, 2013). This research will utilize Melnyk and Fineout-Overholt's (2011) steps to appraising clinical evidence to determine the relevance of each study reviewed. Two randomized controlled studies relevant to the clinical question were further analyzed along with four cross-sectional studies and one pretest, posttest quasi-experimental study. The research proves that medication adherence and healthy lifestyle educational programs will decrease blood pressure in patients with hypertension. Based on the evidence presented there should be a shift in practice to incorporate educational programs targeting medication adherence and healthy lifestyle interventions as part of every hypertensive patient's plan of care.

Keywords: Hypertension, decreasing blood pressure, medication adherence and lifestyle

Small Businesses Research

Yeimy Fuentes'16
Math, Marketing Management Business Law
Faculty Mentors: Dr. Naatus and Dr. Trillo

The Small Business Research project involved several months of primary data collection, including observational research of the small business environment in the diverse, urban community of Jersey City Heights, followed by in-depth open-ended interviews of small business owners. Coding, Transcribing and analyzing data were the next steps of the research, during which the students faced some challenges but learned many lessons about the research process. Findings from the small samp of 30 businesses interviewed during the summer of 2013, led the researchers to conclude that the process of business decision making is much more complex than one might assume and that it is not a purely rational, profit-driven approach. Instead, we learned that many owners a influenced by social and cultural forces when deciding what type of business to open and how to run the business. These findings are supported by previous research in the field of urban entrepreneurship an small business decision-making.

Studies of endocrine disrupting chemicals on *Xenopus laevis* development

Bernadette Sylla '14
Faculty mentors: Dr. E. Regina Giuliani and Dr. Laura H. Twersky
Biology

Endocrine disrupting chemicals (EDCs) such as phthalates, bisphenol A, and some herbicides, are exogenous substances with the ability to interfere with crucial signaling chemicals of the endocrine system. Their environmental abundance has been increasing. They have been linked to negatively affect neurodevelopment, reproduction, morphological changes, and other processes. Mechanisms of action of EDCs include estrogen and thyroid hormone disruption. This study was designed to study the effects of the selected EDCs (diethyl phthalates, bisphenol A, amino ethyl propanol, and dimethicone) on neurodevelopment and the morphology of *Xenopus laevis*. Five groups of six *Xenopus laevis* embryos were incubated with the above EDCs, and were compared to controls incubated in dechlorinated tap water. The experimental groups were exposed to 10μg/ml of each chemical, which was brought to a 1:100 final concentration with dechlorinated tap water. No significant neurodevelopment differences were observed among the different groups; however, other physical and behavioral differences, including spinal curvatures, swimming patterns, size, pigmentation, and mortality, were significantly altered.

Supported by a grant from the Tri-Beta Research Foundation.

Presented at the Tri-Beta NE-1 Research Convention at the College of Mount St. Vincent , April 26th, 2014

Quantitation of Putative Anti-angiogenic Combinations Resveratrol, Ellagic Acid, Quercetin, and Ascorbic Aci using the Chicken Embryonic Chorioallantoic Membrar (CAM) Assay

Jennifer Gabarro '14
Faculty mentor: Dr. Laura H. Twersky
Biology

We are investigating possible synergistic interactions of vario dietary factors reported to have anti-angiogenic properties: resveratrol (grapes), ellagic acid (raspberries), ascorbic acid (citrus fruits), a quercetin (apples). Trials consist of 31 fertilized chicken eggs incubated four days. Photographs are taken, with a Cannon EOS Digital camera, c selected area of developing blood vessels on the surface of the chick chorioallantoic membrane (CAM) before and after application of diet factors. Different combinations of dietary factors (7.5 and micrograms/microliter) are applied with **Thermanox** coverslips to an a of relatively densely packed blood vessels in the CAM. Three dro (0.15ml) of the factor(s) are applied to each coverslip, which is then flipp over and placed on top of the CAM, so that drops directly contact blo vessels. Eggs develop for another seven days. Photographs are taken blood vessels in the CAM, and controls are compared with experimental groups. Qualitative preliminary results were rated on a sc from 1 to 4: 1= little to no loss of blood vessels and 4= maximum loss blood vessels. Quercetin, ellagic acid, quercetin+ ellagic acid, and ella acid+ ascorbic acid were rated "4" because they showed extensive blo vessel degradation. Quercetin+ ascorbic acid and ellagic acid+ resverat were rated "3" because there was blood vessel degradation in the appl area. Ascorbic acid, resveratrol, and ascorbic acid+ resveratrol were ra "1", because there was little to no blood ves degradation. **ImageJ** software is being used to measure the blood ves area in megapixels. Results may determine the anti-angioge effectiveness of these dietary factor combinations as therapy for can and macular degeneration.

Supported by a grant from the TriBeta Research Foundation

The Effects of Aspirin and Ibuprofen on Limb Regeneration in the Mexican axolotl, *Ambystoma mexicanum*

Tyler Carle ‘14
Anthony DeJesus ‘14
Faculty Mentor: Prof. Christina Poli

This experiment studies the effects of aspirin and ibuprofen on limb regeneration in Ambystoma mexicanum (Mexican axolotl). Based on what is known about the benefit of inflammation as a trophic healing mechanism and due to the known anti-inflammatory effects of aspirin and ibuprofen, it is proposed that taking these NSAIDs to reduce inflammation will have a negative impact on the healing process. To test this hypothesis, Ambystoma mexicanum, which is known to exhibit full limb regeneration in about 40 days, was used to assess the rate of regeneration of the right hindlimb in the presence of aspirin and ibuprofen separately. In a pilot study, eight sub-adult axolotls were used to test methodology and toxicity, the results of which showed aspirin to have severe gastrointestinal effects which rendered data collected unusable. A follow up study was conducted using eight juvenile axolotls where the right hindlimb of each subject was amputated using specific surgical techniques. Six of the eight axolotls were incubated in sodium bicarbonate buffered 0.5% solutions of either aspirin or ibuprofen for 29 days. As a control, two axolotls did not receive any aspirin and were incubated for the same time in water containing the same sodium bicarbonate buffer. After 24 hours of incubation, ibuprofen proved to be fatal killing all three subjects. Results from the aspirin group showed a 23.6% increase in the rate of regeneration during the first 19 days of treatment, and a 51% decrease during the last ten. These results suggest that aspirin is beneficial for a short time after injury when excess inflammation is at its highest, but soon becomes detrimental and counterproductive to the healing process when natural levels of inflammation are inhibited.

Bacterial effect on early development in *Xenopus laevis* (clawed frog)

Mackenzie Sylvester ‘15
Faculty Mentor: Dr. Laura Twersky
Biology

Microbiota is emerging as a prime area of interest in research fo disease pathology. There are research that suggests links between certa microbes and carcinogenesis. The effects of microbial populations on the rate of cellular division may further elaborate the data that suggests there is a relationship that potentially leads to carcinogenesis. Material will be presented on previous research that draws conclusive links between certain bacteria and cancer, as well as current research that has promisi and interesting results. Materials and methods will be presented for the students planned senior research project on the effects of bacterial intrusion on *Xenopus laevis* eggs during cleavage and general awarenes of this trending area of research will be made.

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The Explorer

Jonathan Waddell ‘14
Gabriel Rodriguez ‘14
Computer Science

The NXT: Explorer is a robot built by Legos and programmed with the computer language Java. With the touch sensor, sonar sensor, light sensor and various motors, the Explorer is programmed to continuously move forward and avoid various obstructions. The sonar sensor, located on top of the robot, is programmed to determine when the Explorer is too close to an obstruction. The touch sensor, located on the front the robot, is activated when a force is acted upon the front bumper of the Explorer. The light sensor, located on the back of the robot, indicates that the explorer is in the process of maneuvering around an obstacle. The demonstration will show four cases in which the Explorer maneuvers around obstacles. In case one, there is an obstruction directly in front of the Explorer. Case two presents an obstacle in which the front and left of the Explorer is blocked. The third case will present an obstacle in winch the front, left and right sides are blocked. In the fourth case, it is demonstrated what happens when the sonar sensor of the Explorer misses an obstruction and hits the touch sensor.

The “Concrete Jungle” Becomes Labyrinth: Pilgrimage i the City

Enhui Chen, Thomas J. Hrabal, Lisa A. Magallon, Sarah M. Molin Jerome J. Montero, Jazmin Sanchez

Members of TH122.HP (a.k.a. “The Six-Pack”)

Faculty Mentor: Dr. Susan Graham

When we stepped onto that first train, we did not know we would be pilgrims entering on a journey. It was not a single journey but a doubl journey, one part exterior, finite, physical: travel in the “concrete jungle,” sometimes taking us in circles. The other interior, spiritual, infinite, emotional—and that journey is individual: we go to different spiritual places, even if to the same physical place. The destinations can be the same, but the journey is different for each one, even if it looks the same. Expectations on the spiritual level may be met, but not always. The pilgri is changed.

Yet the pilgrimage is not only spiritual and theological. We can b in New York, one city, and experience the journey as labyrinth, taking us through many cultures, histories, traditions, rituals, theologies, political realities. At our destinations, for an hour or two, we are allowed to be pa of them, to share their world. So the pilgrim gains a new perspective on a those cultures, theologies, histories, and leaves the maze somehow as citizen of a larger world.

So, come on the journey. Walk the mystical labyrinth in the “concrete jungle.” Don’t forget to bring your sneakers.

Observation of Chronological Morphological Ocular Abnormalities of the Ultraviolet (UV) Induced Cataracts of *Xenopus laevis* tadpoles

Jereena Varghese ’15 Nicole Colucci ‘15
Faculty Mentors: Dr. Jill Callahan and Dr. Laura Twersky
Biology and Biology with Concentration in Forensics

The proposed studies investigate how long it would take to observe different levels of opacity in the lens of *Xenopus laevis* after exposure to ultraviolet (UV) radiation.
Experiments using the tadpoles will be run in duplicate. Each trial will consist of two control groups of *Xenopus laevis* tadpoles, which will receive no UV exposure. Each of the two control groups will be exposed to 302nm of UV-B light. Groups of four tadpoles will be used as a control against time elapsed in respect to opacity of the ocular lens. In contract to these two groups, another two groups consisting of four tadpoles (per trial per time allotted) will be exposed to 302nm of the ultraviolet spectrum. Timespans decided to be tested are two groups per second for 1 to 5 seconds and 1 to 5 minutes.
Observations and determination of opacity will be taken after 1 hour of UV light exposure and after 24 hours, via a dissecting microscope. Preliminary findings indicated after observation, the earliest detection of cataracts was observed after 24 hours of the tadpoles with 3 seconds UV light exposure. However, the trials of 4 and 5 seconds of UV exposure shows cataracts were visible with and without a microscope.

Challenges for Adaptation to Motion Sickness

Shannon Daniels, Kayla Hanley ‘14
Faculty Mentors: Dr. Frederick Bonato (Montclair State University and Dr. Andrea Bubka
Psychology

It is well known that adaptation to conditions that cause motion sickness and its variants (e.g. space motion sickness, simulator sickness) occur, b finding ways to systematically ‘desensitize’ individuals to nauseogenic stimuli has been a challenge. Results obtained by our group and others suggest that sometimes adaptation can be rapid and both statistically an clinically significant. A main goal however is to transfer adaptation benefi from one environment (e.g. lab) to another (e.g. spacecraft, aircraft).

Gender Differences on Emotional Responses for Color and Saturation

Kayla Hanley ‘14
Faculty Mentor: Maryellen Hamilton, PhD.
Psychology

Gender differences have been found both in color preference and the emotional impact of color (Yildrim, 2007;2011). The current experiment attempted to further these findings by adding the variable of saturation. Participants were presented with pictures varying in color type and color saturation and they had to indicate how the picture made them feel. Gender differences were found on emotions for both saturation and colo type. Implications of these findings will be discussed.

The Effects of Curcumin and Epigallocatechin Gallate (EGCG) on Neurulation and Brain Development in African Clawed Frogs (*Xenopus laevis*)

Leesha Meredith'14
Faculty Mentors : Dr. Jill Callahan and Dr. Laura Twersky

Food is recognized as a means to provide energy and fundamental building blocks to the body. However, it is also able to prevent and protect against diseases. In recent years, researchers have found evidence for the influence of dietary factors on brain function. Many studies have shown that curcumin, a yellow pigment in the South Asian spice turmeric, and epigallocatechin gallate (EGCG), the most abundant catechin in green tea, have anti-inflammation, anti-oxidative, and tumor reduction properties; and are capable of providing neuroprotection against many neurogenerative conditions. This study proposes to explore the effects of curcumin and EGCG on neurulation and brain development on *Xenopus laevis*. Specifically, the effects of curcumin and EGCG will be evaluated by incubating *Xenopus laevis* embryos in different concentrations of curcumin and EGCG individually, and both curcumin and EGCG combined. These amphibians will then be monitored for neural development at several stages of maturation. Results were expected to reveal whether curcumin and EGCG in any way inhibited, enhanced, or hindered brain function in *Xenopus laevis*; however, the data obtained has shown inconsistencies that prevent us from forming concrete conclusions pertaining to the effects of these dietary factors.

Anchors Away: When 1500 is not fifteen hundred or one thousand five hundred

Alexandra Velazquez'14
Faculty Mentor: Michael Greenstein
Psychology

Previous research exploring anchoring suggests that people represent anchors semantically. Assuming this to be true, similar semantic concept expressed differently should be treated the same. We tested this by presenting participants with one of three potential anchors, all of which h the same semantic meaning. We found that the length of the semantic anchor affected a person's judgment. These findings may add additional knowledge in anchoring, in that it may guide us toward understanding wh we represent anchors the way we do.

The Carriage Rate of *Staphylococcus aureus* in a College Setting

Monique Marinas ’14
Faculty Mentor: Dr. Frances Raleigh
Biology

Staphylococcus aureus is a potentially pathogenic bacterium that can be part of the skin microbiota. Pathogenesis can occur when skin is breached and S. *aureus* enters the blood stream. There are studies on *Staphylococcus aureus* nasal and hand carriage rates of workers, students, and patients in healthcare settings. According to CDC, about 30% are carriers in the nose. This experiment examines the skin carriage rate of *Staphylococcus aureus* on the hands of college students (science and non-science majors) in a non-healthcare setting. The hypothesis proposes that the skin carriage rate is similar to CDC's nose carriage rate. The hands of 98 students were swabbed, washed, and swabbed again. The swabs were smeared onto mannitol salt agar. The findings show that 31.6% of the 98 students are carriers to *Staphylococcus aureus* after hand washing. A second hypothesis proposes that science students have a higher carriage rate than non- science majors. The results show no significant difference between science and non- science students. A statistical difference between genders among non-science majors may be an artifact. Increasing the population size can further this study. The more commensal bacterium, *Staphylococcus epidermidis,* is also included in this experiment, but the attention to it is not as detailed.

The Effects of a Mixture of Coconut and Virgin Olive Oil on the Pathogen Staphylococcus aureus

Sherif Elkattawy ’14
David Belloso ‘14
Faculty Mentor: Dr. Jill Callahan
Biology

Staphylococcus aureus is the cause of a variety of infections th range from mild to severe. It is a bacterium that can interfere with t proper function of the respiratory muscles and be fatal. Understanding t necessary treatment to prevent the proliferation of the bacterium cou lead to the rescuing of lives. We are seeking to test the hypothesis tha mixture of coconut and virgin olive oil will decolonize S. *aureus*. To te the efficacy of these natural dietary factors, we are going to be applying *aureus* with coconut oil, virgin olive oil, and a mixture of both coconut and virgin olive oil. We will be testing our hypothesis that these o individually or as a mixture can decolonize the bacterium S.*aureus*.

Cybersickness and Small Devices

Valezka L. Cruz ’14, Kayla Hanley’14, Alexandra Velazquez ‘14, Shannon Daniels
Faculty Mentors: Dr. Andrea Bubka and Dr. Frederick Bonato (Montclair State University)
Psychology

With the iOS 7 software design for iPhones and iPads, some users have reported cybersickness symptoms such as headache, eyestrain, dizzines vertigo, and even nausea. It has been documented that simulators and 3 movies with large screens can produce such symptoms. Can cybersickness occur while using a device with a small screen? Results o an experiment conducted on these devices with and without motion suggest that cybersickness can be produced. Adaptation will be discusse

The Multiple Work Worlds of Children and Immigrants

Michelle Perez ’16 (Political Science, Philosophy, Anthropology)
Emmanuel Brito ’16 (Sociology and Philosophy)
Mariela Figueroa ’16 (Sociology, Anthropology Minor) Rosanna Hernandez ’14 (Political Science)
Faculty Mentor: Dr. David Surrey

This paper, written with significant input from the children of immigrants attending Saint Peter’s University, examines the multiple layers of negotiations faced in our daily lives. Far deeper than the formal roles as employees, as students or both, we are expected to perform a series of informal activities that, while not often highly valued in mainstream culture, are essential for our families’ survival. We have been looking at the double, often triple, duties that are unique to children of immigrants who are also first generation college students. We are both obligated to maintain our parents’ culture, as well as teach them the avenues for achievement in the United States. Often forced to serve as language translators, cultural interpreters, representatives in court, aiding in tax return applications, as well as explaining why holidays have shifted from religious to commercial significance, the duties are endless. As adolescents we are also faced with pressures to define who we are. Our lives are further complicated by birth order, gender, and immigration status. Yet, despite these additional challenges to a person, if we have children, we also hope to raise them in the two worlds we live. We feel that we have to work in many ways much harder than our second-generation contemporaries; however, we also feel we are much more motivated then our peers. We will share our experiences from our parents’ roots in the Dominican Republic, Honduras, and Colombia. We cannot let our parents or our cultures down.

Detecting Subsurface Abnormalities using Infrared Thermal ImagingSaint Peter’s University, Department of Applied Science and Technology

Nykosi Hollingsworth
Faculty Mentor: Dr. Debing Zeng
Physics

Women all around America are encouraged to have regular mammogran in order to detect early stages of breast cancer, but the risk factors associated with mammograms are rarely mentioned. These risks include radiation poisoning and accidental dissemination of cancer cells when th breast is under compression. Thermography is a safe, non-contact, non-radiation alternative to a mammogram which uses infrared thermal imagi to detect lesions beneath the skin. However, variable such as skin thickness, lesion depth, lesion size, and the thermal dynamic properties o both the lesion and the skin may vary readings provided by this imaging technique. This research was conducted by creating a virtual model of th skin to determine the effects of these variables. The results show that varied thermodynamic properties of the skin are negligible to the final thermal image; whereas lesion depth shows some effect, lesion size has the greatest influence on thermal distribution.

Pheromones of Ants

Wilzer Dorielan ‘15, Quayyum Morakinyo ’14
Faculty mentor: Dr. Jill Callahan
Biology

Harvester ants use pheromones to do a variety of different functions. Some pheromones that are secreted help these ants rapidly learn routes that lead to food. Some Pheromones help ants move dead ants to the waste pile. Other pheromones help mating rituals of the male and female ant. During this experiment different chemicals will be used to create ant pheromones. These synthetic pheromones were diluted to test to mimic real pheromones of wild harvester ants. The results were tested in a number of ways. The nest pheromone was used in order for the ants to return the food to the proper area. Results for experiment one included the ants biting off pieces of the leaves and returning it back to the nest for of the colony. This was to test success of the nesting pheromone. Experiment two procedure included the death pheromone being painted on a live ant. This pheromone would activate the ant sense to believe a live ant was actually dead. Results were tested by proper functioning of the ant. Experiment three included making an ant trail. if the ants followed the synthetic path that was painted on the paper, this would mean success webrushing the sex pheromone on the ant or a piece of paper and seeing the reaction. Taken together these result demonstrated ant activity in the wild and the major role of pheromones use to help survival.

Science and the Synthesis of Artificial Scents and Flavo

Grishma Patel ‘16 Thao Ngo ’14, Peter Telidecki ’16, Justin Johns
’16
Faculty Mentors: Dr. Jessica Epstein and Michael Castaldi, M.S.
Chemistry

In this project for the organic chemistry laboratory, we bring together and expand upon two classic undergraduate organic chemistry experiments t create a flavor chemistry unit in which students design and develop a no smelling product. The scents are derived from a synthetic angle, utilizing expanded ester synthesis, and from a natural products angle by the isolation of fragrance molecules from natural materials using classic extraction techniques. Groups are given an overview of flavor chemistry and each group designs a novel product, a scented soap or candle.

Further study of the Alkylation of Substituted 5-Amino Tetrazoles

Briana Williams'14 (Chemistry) Peter Teledeki '15 (Psychology and Biology) Angel Munoz '15 (Biology)

Faculty Mentors: Michael Castaldi and Dr. Jessica Epstein

The preparation of tetrazole is traditionally accomplished in high-boiling solvents in the presence of sodium azide and base. These conditions are generally not suitable for large- scale synthesis due to the energetics of the intermediates and products. A new process for the formation of aminotetrazoles is presented that addresses some of the safety issues associated with these reactions. Additionally, conditions have been identified for a highly regioselective tetrazole alkylation at the 2-position of the substituted amino tetrazoles.

Sammie's Sandwiches: A Book Proposal

Ann Osequera '14
Lauren Fleites '16
Natalie Castillo '14
Marisa Carlucci '16

Faculty Mentor: Dr. Fatima Shaik
Communications

Our project, "Sammie's Sandwiches: A Book Proposal", is a carefull planned book proposal created by four students in Dr. Shaik's Introduction to Publishing course. With our knowledge of how the book publishing industry works, we created a book idea that would fi within a niche market of young children and their parents. After determining who our audience would be, we also assessed how the book would influence the culture by using several other books as models. From there, we created a marketing plan.

Other aspects of the book plan include a press release and a cover. The dimensions of our book, and the fonts, ink colors, and paper typ were taken into consideration when we referred to several publishiri houses in order to determine the price of our book. Changes were made accordingly if we thought that a certain feature of the book caused it to be too pricey, as we did not want it to be too pricey for our audience. Overall, we focused on every aspect of publishing the book except for actually writing it.

The Effects of Curcumin and Epigallocatechin Gallate (EGCG) on Neurulation in *Xenopus laevis*

Cassandra Demosthenes ‘14
Lab Partner: Leesha Meredith ‘14
Faculty mentor: Dr. Laura Twersky

Many studies have shown that curcumin, the yellow pigment in turmeric and epigallocatechin gallate (EGCG) in green tea possess anti-inflammatory, anti-oxidative stress, tumor reduction, and neuroprotective properties against many neurodegenerative conditions. This research is on the possible synergistic effects of EGCG and curcumin on neurulation in *Xenopus laevis*. The effects of EGCG and curcumin are evaluated by incubating *Xenopus laevis* embryos in different concentrations of EGCG, curcumin, and a combination of both. Stage numbers of the embryos were recorded at various time intervals after the start of incubation. Time was measured starting with the neural plate stages, through the neural fold stages, and ending with the neural tube stages. The experimental groups are compared to the control group to observe any morphological changes. The hypothesis for this experiment is that the synergistic effects of EGCG and curcumin on the rate of neurulation in *Xenopus laevis* are greater than that of using factors alone. In addition, a literature review of the effects of dietary factor combinations on neurodegeneration disorders was done.

Funded by: Merck Undergraduate Science Endeavors Program and Beta, Beta, Beta Research Grant.

Reliability and Validity of three Constructs about Facebook Behavior

Elise Sores ‘16
Faculty mentor: Dr. Maryellen Hamilton
Psychology

Greenwood (2013) created a test that classified Facebook (FB) behavior into three constructs; FB-Posting, FB-Responding and FB-Lurking. The purpose of the current study was to expand this test by increasing the number of test items and to assess the reliability of the items and validity the constructs. It was found that the new test had good inter-item reliabili However, the results question the validity of FB-Posting and FB-Responding as distinct constructs.

Student Prepared Media to Document Instrumentation and Basic Chemical Laboratory Operations

Justin Johnson ’16, Angel Munoz ’14, Peter Telidecki ’16, Thao Ngo ’14, Grishma Patel ‘16

Faculty Mentors: Dr. Jessica Epstein and Michael Castaldi, M.S. Chemistry

Documentation of the use of instrumentation can be problematic especially in the current IT world. Often, the IT department makes changes to university computers and the upgrades are not compatible with the software the department is using. Often the IT changes make the instrument software inoperable. Documenting previous software where the instruments function optimally is very useful when operating systems are upgraded. One can show the IT specialist a working operating system and this helps them rectify platform problems easily. We have extended this documentation of working practices to include student prepared videos that are available to all students in our organic chemistry section. The videos are student prepared on the basic organic procedures. We find that these videos received very enthusiastic and the students make connections and comments more relevant than the instructors. Students also make comments; make suggestions of what to prepare and will refine the presentation without prompts from the faculty.

We congratulate all of the

participants on their presentations
and we wish them luck on
the completion of their research.

ACADEMIC SYMPOSIUM 2014

A Celebration of
Student Accomplishments

Wednesday, April 30th, 2014
Duncan Sky Room
12:00 -1:00 p.m.

Sponsored by the Rho Nu chapter of TriBeta (the National Biological Honor Society), the Biology Department and the Office of the Academic Dean at Saint Peter's University.