# Introduction

This is the second year the Garden State Louis Stokes Alliance for Minority Participation ( GS-LSAMP) program, formerly called Pathways for Academic Success in the Sciences or PASS, has put together such publication in order to recognize the research efforts and successes by William Paterson University science majors.

As previous noted, Summer Research Internships and Externships have provided students with the opportunity to work on or off campus, in a laboratory or in their field of interest , under the supervision of a faculty. Such opportunity has allowed them to experience firsthand "how scientists work" and how to conduct scientific research. Many actively participated in specific projects, learn new techniques including the use of elaborate laboratory equipments, computer - assisted analyses, animal husbandry and handling, to name a few. Others have spent their summers volunteering or shadowing physicians in Hospitals and Health Clinics. Such internship has proven to be a valuable asset for students applying to Graduate or Professional school, or in job placement or career selection following graduation.

Many of the students included in this publication are ISSBB ( Increasing Student Success in Biology and Biotechnology) scholars. All have presented their summer experience at one our monthly meetings in the Fall 2010 semester. Additionally, several GS-LSAMP students presented their work at the Undergraduate Research Symposium which took place at WPU in April 2011. Most of these abstracts or summaries are in their own words and represent an honest and candid account of their work. Other abstracts are more formal and were presented at a national scientific meeting.

These summer internships would not have been possible without the support of the Biology, Chemistry and Environmental Sciences faculty who have volunteered to mentor our students. Others have provided contacts for off campus opportunities. Many thanks to Dr. Nina Jemmott from the Provost's office and Dr. De Young, Dean of the College of Science and Health (CSH) for providing the stipends to most of our summer interns. This publication would not be possible without the support of Dr. Jean Fuller-Stanley, Associate Dean of CSH, LSAMP project director at WPU. Special thanks to Rita Levine and Andres Salazar of the Science Enrichment Center for their support with this manuscript.

We hope that next's year publication will include many more interns and mentors.

*Dr. Danielle Desroches*
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Human Physiology and Neuro-endocrinology, PhD
Anatomy and Physiology Coordinator
Minority Association of Pre Medical Students ( MAPS) Coordinator
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**CLINICAL RESEARCH PROGRAM (EM)**
Saint Joseph Regional Medical Center, Paterson NJ
Director: Dr. David Adinaro
**Coordinator at WPU: Dr. Claire Leonard**

**2009**
**Ana Sanchez**

**2010**
**Heidi Rogers**
**Courtney Dorber**
**Ashley Jones**
**Vivin Mohan**
**Kaiti Robertazzi**

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**Tara Halpern**
Madalian Chiropractic and Physical Therapy Center in Wayne, NJ

# TEACHING INTERNSHIP

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**William Manzo**
William Paterson University- Noyce Summer Internship

# GS-LSAMP monthly meetings

# GS-LSAMP students at the 5th Undergraduate Research Symposium at William Paterson University April 16, 2011

# RESEARCH INTERNSHIPS

## Asiel A. Benitez, an ISSBB scholar

**Highest GS-LSAMP awards: Spring 2010, fall 2011**
**GS-LSAMP summer internship award, 2010**
**GS-LSAMP Graduating Senior Award, 2011**
**Undergraduate Research Symposium: Cell &Molecular Biology 2011, 1st place**
**Outstanding Senior Biology Award, 2011**
**MAPS President 2010-20111**

***Mentor: Alan Belicha-Villanueva, Mount Sinai, NYC***

Asiel graduated in May 2011 with a B.S. in Biotechnology. He will be pursuing his doctorate at Mount Sinai, in NYC

## Development of a New Castle Virus with Enhanced Stability at Ambient Temperatures

Asiel A. Benitez-William Paterson University
Alan Belicha-Villanueva, Ph.D. (Mentor), Mount Sinai School of Medicine
Adolfo Garcia-Sastre, Ph.D. (Primary Investigator), Mount Sinai School of Medicine

NewCastle disease virus (NDV) is a negative sense-single stranded RNA virus that belongs to the Paramyxoviridae family. NDV infection in poultry results in respiratory disease and egg production losses, thus rendering it a virus of great economic importance. While inactivated vaccines are commercially available, live-attenuated vaccines are preferred given the broader and more potent immune response they elicit. Maintenance of vaccines at cold temperatures results in a significant economic burden on the poultry industry. Thus, the identification of mutations that enhance the stability of the virus is of great importance in order to alleviate the high cost of refrigeration. The goal of this study is to identify those mutations responsible for the enhanced stability of the virus at ambient temperatures.

Currently we have been able to isolate an NDV variant that has the desired phenotype, being able to withstand 33$^{o}$C for at least 48 hours longer than the parental from which it was selected. Future studies are undergoing to determine the mutations responsible for the enhanced stability.

## Sequencing Optimization of the Non-Coding Regions of Influenza A

Influenza A virus 3' and 5' ends of each segment are significantly conserved and form part of the non-coding regions or NCRs. When the 3' end and 5' interact with each other, they generate a secondary RNA structure that is recognized by the viral polymerase complex. Introduction of mutations in the promoter can lead to a better understanding of how these regulate transcription versus replication. However, screening for mutations in the promoter using conventional sequencing methods can obscure such mutations. This project involved optimizing a method to sequence the NCR of Influenza A viruses by removing 5' phosphates, ligation of the 3' to the 5' ends and performing a segment specific RT-PCR leaving the mutations of interest in the middle of the amplicon. Using this optimized method, we were able to sequence the NCRs in over 90% of the samples processed.

References:

de Wit E, Bestebroer TM, Spronker MIJ, Rimmelzwaan GF, Osterhaus A, Fouchier R. "Rapid sequencing of the non-coding regions of influenza A virus ." *Journal of Virological Methods*. 139.1 (2007): 85-89.

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## Mushhood Sheikh, an ISSBB scholar

### MAPS officer

***Mentor: Dr. Kendall Martin, Biology***

**Mushood Sheik,** graduated in May 2011 with a B.S. in Biotechnology. He has applied for the M.S. Program in the Molecular Biology/Microbiology. His future goal is to continue doing research in the medical field and to work for the pharmaceutical company.

This past summer, he worked with Dr. Kendall Martin on his USDA Project on optimizing the Anaerobic Soil Disinfestations (ASD) as an alternation of methyl bromide.

# Optimization Microbial Community Analysis to Study Alternatives to Methyl Bromide (MeBr) for Soil Disinfestations

**Abstract:**

MeBr is the most popular soil fumigant but has been phase-out in awareness of its damaging effect on the earth's protective ozone layer. There are several alternatives to the MeBr for dramatically shifting the community structure of the soil. These run the gamut from other, less volatile chemical fumigants such as some Iodine based compounds to approaches that use biotic or physical stressors such as anaerobic soil disinfestations (ASD). The goal of my project is to optimize microbial community analysis to support the larger goal of examine the changes in disinfected bacterial soil communities from anaerobic soil disinfestations (ASD) sample. My project is focusing on creating model bacterial DNA communities to measure the threshold for detecting the smallest component in the DNA mix and on measuring the effect on these thresholds of varying the total amount of DNA. My microbial communities include *E. coli* (gram negative), *Micrococcus luteus* (gram positive) and *Clostridium* (gram positive). These bacteria cover a wide taxonomic range and studied through the use of LHPCR of 16s rDNA with fluorescent labeled primers. In length heterogeneity PCR (LH-PCR), labeled primer is used with capillary electrophoresis to determine the relative amounts of amplified sequences originating from different microorganisms. (Ritchie *et al.* 2000). LH-PCR determines the relative proportions of amplicons originating from different organisms by measuring the fluorescence emission of a labeled primer and discriminates amplicons originating from different organisms based on natural variation in the lengths of SSU rDNAs. (Suzuki *et al.* 1998). Results from LHPCR for a range of model communities will be compared with LHPCR obtained for soil populations to help characterize changes in the soils.

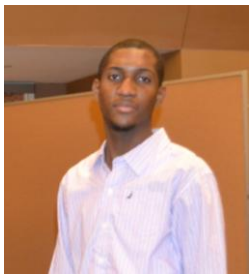
**Obinna Onyekwere**

**MAPS officer**

**Undergraduate Research Symposium Award 2011- Physiology**

***Mentor: Dr. J. Menon***

I am currently a junior, majoring in Biology. My ultimate goal is to become a medical doctor. During the summer of 2010, I worked with Dr Jaishri Menon on her research dealing with Metamorphosis in *Xenopus laevis* and how it is mediated. I enjoy every minute working with Dr Jaishri Menon. Also the knowledge which I gained on the most up-to-date lab techniques is invaluable. The experience was exciting during the summer, and as such I intend to continue working with Dr Jaishri Menon this coming summer of 2011.



# Nitric Oxide and Skin Transformation during Metamorphosis: A Decision to Live or Die!!!

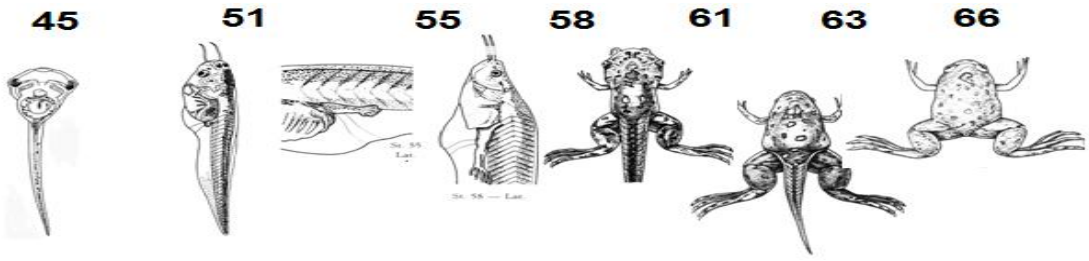
**Obinna Onyekwere and *Jaishri Menon***

Department of Biology, William Paterson University of New Jersey, Wayne, NJ

Metamorphosis is the gradual transformation of a larva into an adult. It is characterized by extensive remodeling of the intestine which changes dramatically during a short period of metamorphic climax, There is also a complete regression of the tail of the tadpole to become a froglet, however, the skin undergoes morphological, biochemical and physiological changes to adapt to a different habitat. Amphibian skin is also a good model for studying skin differentiation because larval body epidermis remains non-keratinized throughout the larval life and keratinizes during metamorphosis, resulting in adult frogs with a distinct stratum corneum, i.e. cornified epidermal cells covering the body. Body epidermis, consists of apical cells, skein cells, and basal cells which are the stem cells: while the larval cells disappear by apoptosis, the adult stem cells differentiate into adult epidermis. Cell death during metamorphosis is mediated either by caspase dependent or caspase-independent pathways. The caspase independent pathway may utilize the Reactive Oxygen Species (ROS) to commence cell death.

Results from our lab have shown that oxidative stress which is defined as disturbance in the balance between the production of reactive oxygen species, or free radicals and antioxidant defenses plays an important role in intestine remodeling during metamorphosis. Superoxide dismutase (SOD) catalyzes the dismutation of highly reactive superoxide anion to molecular oxygen and hydrogen peroxide and catalase catalyses the conversion of $H_2O_2$ into molecular oxygen and water. Nitric oxide (NO) is also a free radical produced by mitochondria and mitochondrial $Ca^{2+}$ uptake stimulates NO production. In the present study, we have carried out following studies during climax of metamorphosis in tadpoles, *Xenopus laevis*

a. the role of two antioxidant enzymes catalase and SOD which safeguard cells from reactive oxygen species.
b. *in situ* double immunostaining staining for NO and mitochondria using NO-sensitive fluorescent dye DAF-2DA (DAF-2DA, is a membrane permeable compound, which diffuses into the cells, and reacts with NO to form fluorescent precipitates) and rhodamine respectively
c. *in situ* double immunostaining for NO and Calcium using fluorescent dye calcium crimson
d. immunohistochemistry for caspase



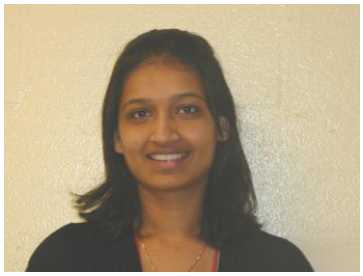
Our results indicate that during climax, catalase was found to be present in specific cell types of basal layer of skin but SOD was completely lacking which means larval cell death might be partly due to formation of superoxide and catalase protects larva to adult cells from this highly reactive ROS. There is also co-localization for NO and mitochondria as well as NO and calcium. These findings are discussed in terms of putative functional importance of mitochondrial derived NO and mitochondrial $Ca^{2+}$ homeostasis which may play a significant role in morphogenesis of this organ. Complete lack of caspase during critical stages of skin transformation indicates that larval cell death in skin epidermis might be mediated by ROS, including NO production from mitochondria.

**Acknowledgement**

I want to thank GS-LAMP for providing the funds to make this happen. Also Dr Desroches for her support in acquiring funds to make this project a reality. I most importantly I want to thank my mentor, Dr Jaishri Menon for her patience and knowledge she instilled in me while working in her lab.

## Ankita Shah, an ISSBB scholar

***Mentor: Dr. Bhanu Chauhan, Chemistry***



Ankita Shah graduated in December 2010 with a double major (Biology and Chemistry). She did her undergraduate research in synthesis of platinum nanoparticles (Chemistry) under Dr. Bhanu Chauhan, professor of Chemistry

## Investigation of Monosilane Stabilized Pt-Nanoparticles and Their Applications in Catalytic Hydrosilylation Reactions

Bhanu P.S. Chauhan*, and Ankita Shah
Engineered Nanomaterials Laboratory, Department of Chemistry
William Paterson University, 300 Pompton Road, Wayne, NJ 07470-2103

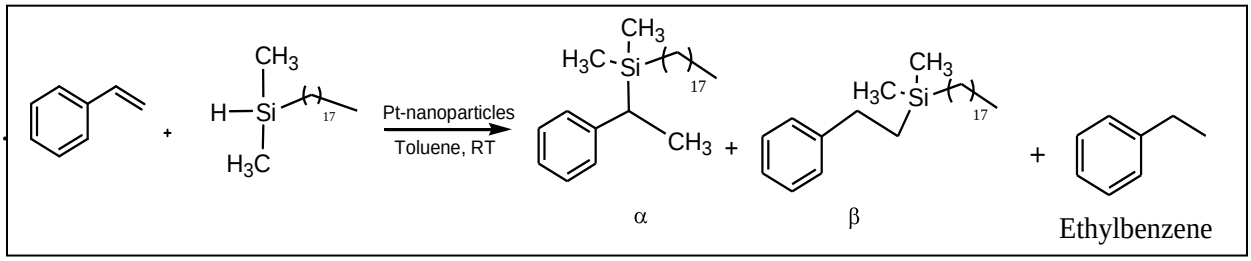
The Hydrosilylation reaction (addition of a (Si-H) bond of a hydrosilane to an unsaturated carbon-carbon bond) is a very important transformation because of its utility in Si-C bond formation reactions. This process is widely utilized in the industrial production of silicon polymers, liquid injection molding products, paper release coatings, and pressure-sensitive adhesives[1]. This reaction can be catalyzed by a number of reagents among which transition metal

compounds are most important. The platinum (Pt) complexes were shown to be excellent hydrosilylation catalysts for a variety of olefin types, exhibiting high selectivity for β-addition product.

Chauhan's group has discovered that the regioselective hydrosilylation reactions can be achieved even on the polymeric systems such as poly(methylhydro)siloxane (PMHS). They have demonstrated that reactions catalyzed by stabilized Pt-nanoclusters can lead to the exclusive formation of β-hydrosilylated products.[2,3]

In continuation of this work, we have been investigating various ways to produce Pt-nanoparticles and study their stability and catalytic properties.[4] In this work, we have synthesized different types of Pt-nanoparticles using octadecylsilane as a reducing agent and different stabilizing agents such as n-Trioctylamine, Triphenylphosphine, and Triphenylphosphine oxide. In our previous report, we described the formation and analysis of such nanoparticles. After accomplishing the catalyst synthesis, we are We testing and profiling the reactivity of these nanoparticles as catalysts in hydrosilylation of styrene with dimethyl octadecylsilane as a silylating agent. Our preliminary results are very interesting. We have observed that (a) Pt-nanoparticle synthesized by this method are active in hydrosilylation catalysis; (b)and more importantly, modulation of catalytic behavior can be achieved, i.e. changing the nature of the stabilizing agents alters the regioselevities of the products (Scheme 1).

**Scheme 1**: Hydrosilylation of styrene with dimethyloctadecylsilane




For example, by using *n*-Trioctylamine stabilized nanoparticles as catalyst, more than

99% β -product was observed, whereas, Triphenylphosphine stabilized nanoparticles were found to be totally ineffective as catalysts. Interestingly, reduction of styrene to produce ethyl benzene took place when Triphenylphosphine oxide stabilized nanoparticles were used as catalysts in the following table

**Comparison of Various Types of Pt-nanoparticles**

| Catalyst Pt-Nanoparticles | α ( % ) | β ( % ) | Reduction product (Ethyl Benzene) ( % ) |
|---|---|---|---|
| PMHS | Trace | >99 | 0 |
| N | Trace | >99 | 0 |
| P | No product formation | No product formation | 0 |
| PO | 0 | 70 | 30 |

We are further extending the scope of this reaction by using PMHS as a silylating agent and investigating the plausible mechanism for this reaction.


1. Lewis, L. N.; Stein, J.; Gao, Y.; Colborn, R. E.; Hutchins, **G. *Platinum Met. Rev.* 1997,** *41*, 66.
2. Chauhan, B. P.S.; Rathore, J. S.; Sarkar, A. ***Polymeric Materials: Sci. and Eng.*** **2010**, *103*, 315-317
3. Chauhan, B. P. S.; Rathore, J. S., ***J. Am. Chem. Soc.*** **2005**, *127, 5790-5791*.
4. Chauhan, B. P. S.; Thekkathu, R.; Lesnoy, T.; Shah, A. ***"43rd, Silicon Symposium"***, Missouri-St. Louis, May 20-22**, 2010**, Abs. P-17.


## Tomiko Rendon, an ISSBB scholar

***Mentor: Dr. Robert Benno, Biology***

I am a junior majoring in Biology with a concentration in Animal Behavior and Physiology. During the summer I was able to work with Dr. Benno and others on a research project involving Poly I:C and its effects on mice social behaviors. During this research project we were analyzing the change that occurred in the mice behavior between juvenile and adulthood, especially the effect of prenatal stress levels. Multiple mice strains were used like BTBR, C57/6J, and S129. The BTBR is commonly known as the autistic model because they display many behaviors that are common to Autism, and the C57/6J served for control purposes. To produce this autistic phenotype in all the mice strains the mother was injected with a Poly I:C injection on day 9.5 of gestation. Poly I:C is a double stranded RNA that activates the immune response and cytokine production that produces Poly I:C autistic phenotypes and mimics the acute phase of a viral infection ( causing prenatal stress). Our hypothesis was that the Poly I:C will not affect BTBR mice, since they already express the autistic phenotype. To observe the Autistic behaviors among the mice we used various test: Marble Burying, Object Recognition test, and the Social Interaction test. The results were then run through statistical test to determine if there were any significant differences.

Overall, this summer research helped me have the opportunity to see what encompasses completing a research project. It also allowed me to prepare for my own independent study in the future, gain the experience of working with live animals, and learn various protocols in animal care facilities.

**Joon Ho Seo and Anabelle Beltran**
***Mentor: Dr. Jeung Woon Lee, Biology***

**Anabelle Beltran: MAPS President, 2008-2010**

**Joon Ho Seo**

# Effect of Streptozotocin in Diabetes-Induced BTBR T$^{+}$ft/J Mice

Dr. Jeung Woon Lee, Joon Ho Seo and Anabelle Beltran
William Paterson University of New Jersey, Biology Department

The BTBR T$^{+}$ft/J mice have been suggested to display social and physiological abnormalities characteristic of Autism Spectrum Disorder. Autistic children display abnormally high tolerance to physical injury, and their incidence of developing diabetes is much higher compared to age-matched control. Previously, our group showed that BTBR mice also have a significantly high tolerance to pain compared to C57 6J (control) to mechanical and chemical stimulations. Furthermore, these mice are highly susceptible to become diabetic. In this experiment, we examined changes in thermal pain behavior in diabetic BTBR mice, and we also examined *c-fos* expressions in spinal cords and PAG with and without a chemical stimulus.

Forty BTBR male mice (40 g) were divided into two groups: a) those that received single injection of streptozotocin (strep, 180 mg/kg, IP) and b) those that received vehicle (Citrate Buffer, IP). Mice were tested for tailflick water bath behaviors (50 °C) at pre-injection, 7D and 14D post injection. Briefly, 2/3 of the tail was submerged in 50 °C water bath until tail flinching behavior was observed. The cutoff time was 20 sec to prevent blistering of the tail. Immediately after behavioral study, blood glucose was determined using a hand-held glucose monitor. An animal with blood glucose level of >350mg/dl was considered to be diabetic. In a second experiment, we examined neurochemical changes in BTBR mice (PAG and spinal cord).

At pre-strep, control and experimental groups averaged 155 mg/dl and 179 mg/dl glucose respectively. There was a difference to a certain degree in tailflick latency between the control and the experimental groups (control = 7.7$\pm$0.5 sec, experimental = 8.6$\pm$1.1 sec). At 7D post-

strep, control and experimental group had 166 mg/dl and 335mg/dl glucose respectively. However, there was no significant difference in tailflick latency between the control and the experimental groups (control = 7.91±1.15 sec, experimental = 7.47±1.2 sec). In the superficial dorsal horn of lumbar spinal cord and in pariaqueductal grey matter, control group that received a chemical stimulus displayed an intense *c-fos* expression, and the control group that did not receive the chemical stimulus did not display *c-fos* expression. In experimental groups, *c-fos* was not observed in mice that did not received the chemical stimulus, and c-fos was expressed in the mice that did receive the chemical stimulus.

Our data suggest that high tolerance to pain observed in BTBRs was not due to lack of substance P in superficial dorsal horn. Neuropathic injury does attenuate the density of substance P, but does not seem to play major role in expression of pain behavior. Diabetes is known to cause diabetic neuropathy in subset of patients. In BTBRs, induction of diabetes did not cause expression of pain behaviors suggesting presence of suppressive agents in the spinal cord level.

**Stephanie Hall and Brandon Jodoin**

***Mentor: Dr. Marty Becker, Environmental Sciences***

## *Squalicorax* Chips a Tooth: A Consequence of Feeding-related Behavior from the Wenonah-Mt. Laurel Navesink Formations (Late Cretaceous: Campanian-Maastrichtian of Monmouth County, New Jersey)

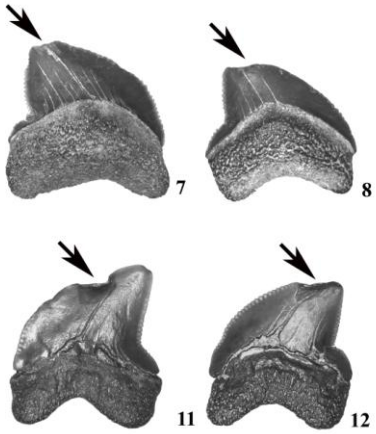
**ABSTRACT:**

"Chipped and broken teeth are common components in both modern and fossil sharks with

serrated tooth morphology. Tooth damage occurs primarily as splintering, cracking, and flaking

near the cusp apex where the enameloid has been removed and exposes the osteodentine and orthodentine. Analysis of large, modern shark jaws with serrated tooth morphology as well as literature sources indicate such damage is the result of enormous forces applied during feeding as the tooth apex impacts robust skeletal elements of prey items. Damage is seen in an assemblage of isolated teeth from sharks *Squalicorax* pristidontus and *Squalicorax* kaupi from the late Cretaceous New Jersey bear striking resemblance to these modern shark teeth and suggest similar feeding behavior occurred. Rare North American preservation events with *Squalicorax* associated directly and indirectly with osteichthyan and reptile skeletal elements

reinforce this viewpoint. Tumbling experiments with isolated modern and fossil teeth with serrated morphology further demonstrate that chipped and broken *Squalicorax* teeth are feeding-related and not taphonomic in origin. Evolution of rapid tooth replacement in large sharks with serrated tooth morphology such as *Squalicorax* ensured maximum functionality after feeding-related tooth damage occurred. Serrated tooth morphology and rapid tooth replacement in large sharks throughout the Mesozoic and Cenozoic strengthened their places as apex predators into today's oceans."




## Matthew Snyder

***Mentor: Dr. Jim Sumowski, Kessler Institute***

I am a fifth year senior and currently in my last semester at WPU. At the moment, I'm researching the effects of amphetamine on different strains of mice with Dr. Robert Benno to complete my biology degree, and to be able to graduate with biopsychology honors. After I graduate, I plan to attend P.A. school, in hopes of becoming a pediatric P.A. with an MPH in the future.

I did my 2010 summer internship at the Kessler Foundation Research Center, Neuropsychology and Neuroscience Lab in West Orange, N.J. I studied under Dr. Jim Sumowski, who currently researches patterns of neuropsychological functioning in person with Multiple Sclerosis and Traumatic Brain Injury. He has a specific interest in how cognition and cerebral activity are influenced by cognitive reserve, or the mind's resilience to neuropathologies. Dr. Sumowski, along with colleagues at Kessler Foundation, published an article entitled "Intellectual enrichment is linked to cerebral efficiency in multiple sclerosis:

functional magnetic resonance imaging (fMRI) evidence for cognitive reserve," a few months prior to my internship. The researchers showed that blood flow, measured by fMRI, changed in different regions of the brain when performing various working memory tasks. Voxel-wise correlations in brains of multiple sclerosis patients revealed strong positive correlations between performance on the N-back working memory task and blood flow in the brain's default network, a region of particular interest to Dr. Sumowski.

While interning, I learned the N-back working memory task, which was a crucial part of the research mentioned above. I was also taught how to score the California Verbal Learning Test (CVLT), a neuropsychological test of verbal memory. Finally, I used AFNI, a computer program used to analyze subject's brains and to find correlations in different brain regions. This program was also used in the previously mentioned study, and I was using it to find correlations in certain Broca's Areas for another researcher. Overall, it was a great experience and opened doors for new contacts in the research/medical fields.

## Andres Salazar

***Mentors: Dr. Danielle Desroches and Dr. Jeung Woon Lee, Biology***

I am in my last year of undergraduate studies at William Paterson University in Mathematics with a Minor in Computer Science. I want to pursue a career in finance, either as an actuary or a statistician. I plan to attend the University of New York for a Masters in Scientific Computing. This summer, I plan to do research in Switzerland at the University of Zurich, still waiting to hear from them. Since the science building is being remodeled, I had the opportunity to interns as a computer specialist for the Biology department during the summer of 2010. I implemented my computer skills to create and video tutorial for the anatomy and physiology labs. Under the supervision of Dr. Lee, we created "Urinalysis" and "Blood Lab Materials and Methods". In these videos, student can identify and follow the different materials and procedures implemented in each lab test. I also had the opportunity to work, under the supervision of Dr. Desroches, as an editor for the General Anatomy and Physiology Lab manuals. I mostly worked in edition and creation of new pictorial that were in and added to the manuals. I want to thank Dr. Desroches and Dr. Lee for this internship opportunity; it was a pleasurable learning experience.

# Paola Chacon and Marilarnia Dejesus

**ISSBB Scholars**

***Mentor: Dr. Lance Risley, Biology***

During the summer of 2010 we conducted bat research under the supervision of Dr. Lance Risley, which took place at the FAA Technical Center, Atlantic City, NJ. The purpose of this research was to collect bats and test them for mercury residues since the area where they were collected was shown to test positive for mercury in the soil. We captured bats with nylon mist nets. Testing on the bats was done by collecting guano and hair samples, these were then sent to labs for analysis. We also checked the bats for symptoms of White Nose Syndrome, which is an epidemic killing a large percentage of bats in the northeastern US. Upon releasing the bats, these were banded for identification in future captures.

# BIOMEDICAL INTERNSHIPS

**CLINICAL RESEARCH PROGRAM (EM)**
**Saint Joseph Regional Medical Center,**
**Department of Emergency Medicine, Paterson, NJ**
**Education and Research 2008**
**Director: Dr. David Adinaro, MD, MA, Ed, FACEP**
**WPUNJ- Coordinator: Dr. Claire Leonard**

**Ana Sanchez, BS'10- MAPS President 2006-2008**

I started at William Paterson University in September 2005 as a freshman. I declared a Biology major with a concentration in Physiology and Behavior because of my desire to become a physician and passion for science. Later on, I also declared a Mathematics minor because I realized I enjoyed the subject and excelled at it. What I gained was far beyond a degree. Through my years in the biology department, I became aware and exposed to a multitude of different areas within biology. Each class taught me a new topic of the discipline and each professor shared his/her research and/or expertise. Professors researched everything from mice, bats, amphibians and bees to plants, bacteria and even organisms I didn't know existed. It was easy to find a niche and during my junior and senior years I did research in the mouse lab with Dr. Lee and Dr. Benno. I even got to present some of the work at the WPU Undergraduate Research Symposium in April 2009.

Along with academic work, I was also greatly involved in extracurricular clubs and activities. Since my first year, I was involved with MAPS and Galen Society along with other campus clubs. During my junior and senior year I also assumed leadership roles, becoming President of MAPS. While President, I was heavily involved in the planning and coordinating of the clubs events along with organizing volunteer opportunities for club members. In the Spring 2008 semester, I was able to co-coordinate, with Galen Society, an alternative Spring break volunteer opportunity to build a house under Habitat for Humanity for underprivileged families.

Summer Research Experience

One of my best experiences as an undergraduate was my summer internship at St. Joseph's Regional Medical Center in Paterson, NJ in the Emergency Department during the summer of 2009. With the guidance of Dr. Leonard and Dr. Desroches, I was able to spend the summer among Attending and Resident physicians, as well as medical students and other medical staff, in an emergency room setting. I was selected to participate in the initial launching of the undergraduate Academic Associate program. I participated in developing, organizing, and

maintaining data for a chest pain registry. Aside from my purpose, I gain much exposure to patients and patient care in an extremely high paced environment. I witnessed all types of emergencies from minor abrasions and burns to extreme trauma. I was also exposed to all kinds of patients. Every day was different and each case was new and exciting. I was always eager for my days at the hospital; everyone was always willing to teach or show me something and I always wanted to learn more. The experience proved that becoming a physician is the best career choice for me.

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**Courtney Dorber**

I am a junior majoring in Biology with a Physiology and Behavior concentration. I plan on going to a Physician Assistant school to earn my MA-PA.

**Heidi Rogers**

I am a junior majoring in Biology with a concentration in Animal Physiology and Biopsychology. I plan on going to medical school to earn my doctorate in medicine.

**Ashley Jones**

I am a senior majoring in biology with a concentration in physiology and behavior. I plan on going to medical school to earn my doctorate in medicine.

**Kaiti Robertazzi**

I am a junior Biology major with a concentration in Physiology and Behavior. I plan on going to P.T. school after I graduate.

**Vivin Mohan**

I am currently a senior majoring in Biology with general concentration. I plan on continuing my education after graduation to obtain a Masters Degree and Certification as a Physician Assistant.

Abstract:

Over the summer of 2010, we all had the opportunity to participate in the clinical research/shadowing program at St. Joseph Regional Medical Center in Paterson, New Jersey. During our time there, we collected data on chest pain patients for research purposes. We also had the opportunity to shadow physicians working in the ER. All of us observed many different patients and learned about medical conditions and procedures such as cellulitis, spinal taps, external hemorrhoids, and diseases of the coronary arteries. We were also exposed to the stressful environment of the trauma room, where patients who were in need of immediate attention were sent. This internship provided all of us with a sense of how medical professionals handle the stressful environment of the emergency room.

# Tara Halpern

I did my 2010 summer internship at the Madalian Chiropractic and Physical Therapy Center in Wayne, NJ. Here I shadowed Dr. Madalian and learned about chiropractic medicine and alternative treatment methods. One of the reasons I wanted to shadow a chiropractor, is because I have been apart of several different research projects within WPU'S mouse lab, and was able to observe a spinal surgery on a rodent. I also was working on a research project at the time under my two mentors, Dr. Onaivi, and Dr. Lee, regarding pain management, and found that chiropractics was also a form of treatment for pain management. I had an interest in other fields of medicine, and wanted to learn more about the techniques use, the manual manipulations that Chiropractors perform as well as cooperative medicine. By cooperative, I mean two specialties working together to rehabilitate patients. While spending my time with Dr. Madalian, I learned about the different techniques used by chiropractors, in particular, the Gonstead Method. This method takes into consideration all aspects of the human anatomy and targets multiple areas of the spine to fix the targeted misalignment also known as a subluxation.

As I observed the doctor, I learned about subspecialties in chiropractics such as pediatrics, working with the alignment of extremities, pregnant women, elderly, as well as nutrition. While being a part of the office, I helped teach an informative health and wellness class offered, which put emphasis on healing the body within, as well as keeping your spinal column in alignment to maximize proper functioning of the rest of the body. My role in the office outside of observing the doctor, was to label x-rays taken of patients with information regarding their vertebral column, and differences in the level of the shoulders as well as the hips. This was important to learn, because the course of action that a chiropractor takes is based upon this information. I also helped apply other forms of treatment to patients such as traction, and heat therapy, as well as exercises to strengthen the neck for posture realignment. Setting up a patient with the traction machines was very interesting, and complex. It helped me see that Chiropractics is almost an art-form, due to the architectural reconstruction of a body that is needed, and the lines and geometry that comes into play. Another great experience while being there was to work with a state of the art laser, which was used for deep tissue stimulation to reduce swelling and increase the rate of healing.

It was a great learning experience, being able to work hands on with the patients, become almost the assistant to the doctor, as well as learn about the applications of this particular branch of medicine, and how it is growing rapidly. I am thankful for the opportunity to have had the ability to partake in this internship.

About me: I am currently in my last year, as a Biology major, with a concentration in Physiology and Behavior. I currently work as a laboratory assistant to Dr. Onaivi, and have worked on a few research projects under him regarding the affects of cannabinoids on an autistic

mouse model. I am planning on pursuing a career as a Physician Assistant, as well as obtaining my Masters in Biomedical Science.

# TEACHING INTERNSHIP

**Gabriella Tosto, William Manzo**
**ISSBB SCHOLARS**
**Noyce Internship- Summer 2010**

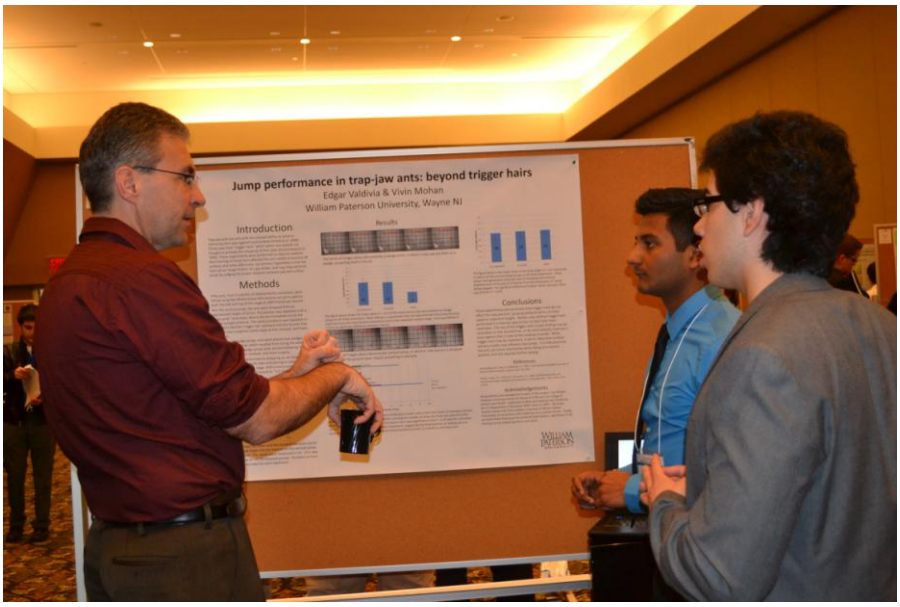
The Noyce Internship is an internship designated to give students a chance at teaching and working with students in preparation for undergraduate teaching certification. Students taught various science classes with the Summer Youth programs including CSI and Gear up for Science. It is a great opportunity to interact with kids as well as figure out if teaching is the right career choice. It also provided a way for students to learn the inner workings of lesson planning and to execute it in a timely and interactive fashion. If interested, students can apply for the Noyce Scholarship, which is specifically for dual Education majors.

# GS-LSAMP MONTHLY MEETINGS


Asiel Benitez making his research presentation at the GS-LSAMP monthly meeting

Member of GS-LASMP

**Several students participated in the 5th Undergraduate Research Symposium April 16, 2011 at William Paterson University.**




Left to right: Dr. Carey Waldburger (WPU, Biology), Vivin Mohan (President of Galen), Edgar Valdivia

Left to right: Tara Halpern, Vivin Mohan, Obinna Onykwere, William Manzo and Dr. Michael Peek (WPU, Biology)