

# The Laboratory Robotics Interest Group Mid Atlantic Chapter

May 2007 Meeting

Posters

## **DETERMINATION OF (NO<sub>3</sub>-) AND (PO<sub>4</sub><sup>3-</sup>) CONCENTRATIONS IN NJ WATER SOURCES**

A. Patel, S. Almagro, J. Aoll, N. Bujalski, D. Giurleo, A. Konopka, E. Mastoras, C. Mora, J. Pardiwala, V. Pimputkar, S. Schulien, K. Shah, A. Shrekoten, S. Johnson, I. Amegor,  
O. Adeyemo, A. de Picciotto (Faculty mentor)

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There are hundreds of thousands of compounds dissolved in every body of water. Some of these compounds are essential for aquatic life. However, at certain concentrations some compounds can be harmful to both the aquatic ecosystem and the environment. The anions in two such compounds that can be used to assess water quality are nitrates (NO<sub>3</sub>-) and phosphates (PO<sub>4</sub><sup>3-</sup>). High concentrations of these ions will promote algae bloom that will result in a recession of the marine ecosystem (Eutrophication), and complete deprivation of oxygen in the ecosystem (Anoxia). Concentrations of ions in water sources vary as a function of geographic location and rainfall, and unless used as drinking water it is usually left unmonitored. It becomes important to regulate these concentrations when a body of water infiltrates into drinking water for human consumption and when algae grows uncontrollably. The EPA has set a maximum NO<sub>3</sub>- concentration of 10 mg/L (ppm) in drinking water. Concentrations as low as 30 ng/L (ppb) have been shown to cause algae blooms in freshwater lakes. To find the concentrations of NO<sub>3</sub>- and PO<sub>4</sub><sup>3-</sup> in Northern New Jersey a UV-visible spectral analysis was conducted for samples taken from four bodies of water that are all affiliated with the water systems of this region.

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## The Design, Synthesis and SAR of New Antidepressants

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### **Abstract**

Drugs that interfere with the reuptake and/or metabolism of biogenic amines have been used to treat depression for more than 4 decades. Early medications such as tricyclic antidepressants (TCAs) and monoamine oxidase inhibitors (MAOIs) are effective, but are marred by many undesirable side effects due to their interactions with multiple receptors or other medications. Selective inhibitors of the reuptake of serotonin (SSRIs) or norepinephrine (NERIs) are the results of rational design to find drugs that are as effective as the TCAs but with more selectivity towards a single monoamine transporter. The SSRI class of drugs, which includes Prozac (fluoxetine), Paxil (paroxetine) and Zoloft (sertraline), were previously viewed as the agents of choice for treating major depression. Recently, inhibitors of both serotonin and norepinephrine reuptake ("dual reuptake inhibitors": SNRI/NSRIs such as milnacipran, venlafaxine and duloxetine) have gained acceptance in the market place. However, neither the SSRIs nor SNRI/NSRIs are ideal, due to their undesirable side effects, delayed onset of action and low rate of response. An important recent development has been the emergence of the triple uptake inhibitors (SNDRI), which inhibit the reuptake of all three neurotransmitters most closely linked to depression: serotonin, norepinephrine, and dopamine. Preclinical studies and clinical trials indicate that a drug inhibiting the reuptake of all three of these neurotransmitters could produce more rapid onset of action and greater efficacy than traditional antidepressants. This presentation will discuss the SAR of antidepressants based on the monoamine hypothesis of depression, the evolution of the biogenic amine-based therapies and the emerging strategies involved in the design and synthesis of novel antidepressants.

## **Brownfields and Urban Redevelopment - NJ Site Mart: Utilization of GPS Enabled Camera and Equipment For In-Situ Verification of 100 Potential Brownfield Sites in Orange, New Jersey**

Amy V. Ferdinand,  
Department of Chemistry and Biochemistry  
Montclair State University

The objective of this project was to provide a systematic process to correctly identify and document Brownfield sites; since miss-identification of sites could jeopardize the success of the redevelopment project. A GPS enabled camera and photo-linked software were used to photograph and record latitude and longitude coordinates for 100 previously mapped sites in New Jersey. The project provided automatic linking of the digital images with GPS location data into ArcView 9.2. These watermarked photographs can be integrated with satellite imagery, street maps, or other GIS-based mapping layers. In-situ verification and mapping of Brownfields sites was greatly enhanced by utilizing a GPS enabled camera.

In 2001 Congress passed The Small Business Liability Relief and Brownfields Revitalization Act; to provide relief for small businesses from liability under the Comprehensive Environmental Response, Compensation, and Liability Act, to promote the cleanup and reuse of Brownfields, to provide financial assistance for Brownfields revitalization, and to enhance State response programs.

The New Jersey Brownfields Redevelopment Task Force is charged with creating an inventory of Brownfields sites. The Brownfields Site Mart was created to enable potential developers to locate and build on land in cities and towns, while preserving the state's dwindling inventory of open space. New Jersey has over 16,000 known contaminated potential Brownfield sites.

The Office of Smart Growth Brownfields Program provided a grant to Montclair State University to populate Site Mart. During the initial project students met with municipal contacts to locate potential sites. Using Map Quest students drove around attempting to locate, and photograph sites. Once back on campus it was difficult to match the photos of the site to the addresses. This project will be able to solve this problem.

### **Are there any alkaloids in Egyptian Blue Lotus, *Nymphaea Caerulea*?**

Noah Segal, Mark Villamil  
Stockton State College  
Advisor Shanthi Rajaraman, Ph.D.

## **Synthesis of Novel Delta Receptor Opioids**

James Graham, Nicole Ruemeli  
Stockton State College  
Advisor Shanthi Rajaraman, Ph.D.

## **Autoresuscitation and SIDS: Exploring the Pet-1 mouse model**

Brian C. Sposato  
The College of New Jersey  
Advisor Jeff Erickson

## **High School Division**

### **Pitches and Tones recognized by the Human ear in Teenage Males vs. Females**

Amanda Bowser

### **The effect of mutagenesis and gene expression on the production of amylase in respect to stain removers.**

Shree Agrawal  
John P. Stevens High School  
Edison, NJ

### **Comparison of the effects of gender and age on the quantity of salivary amylase**

Alix Ablaza  
Moorestown Friends School

### **The Effects of Temperature and Water on the Regeneration of Brown Planarian (*Dugesia tigrina*)**

Ariel Aguiar  
Moorestown Friends School

### **Temperature's Effect on Photosynthetic Rates**

Drew Bachman and Robert Ryczak  
Moorestown Friends School

### **More CO<sub>2</sub>... What Will the Peas Do?**

Janak Bhatt and Ryan Lutz  
Moorestown Friends School

### **Catching the Light Wave: Light Frequencies and Plant Growth Rates**

Sarah Fischer and Kevin Wojcik  
Moorestown Friends School

### **The possible effect of eye astigmatisms on interpreting optical illusions.**

Kayla Fox  
Moorestown Friends School

### **Microgravity Mania**

Lauren Hawkins and Shane Iosca  
Moorestown Friends School

### **Who's Got Cooties: A comparison of student athletes to student non-athletes regarding rates of *Staphylococcus aureus* and MRSA carriage.**

Chris Nigro  
Moorestown Friends School

## **Professional Submissions**

**Integration of Recirculating/Sonicating Wash Functionality into 1536**

## **FLIPR/TETRA**

Michelle Batchlett  
Merck & Co.  
North Wales, PA

Recirculating/Sonication wash baths have been shown to increase cleaning power, reduce solvent requirements and overall cleaning time versus stagnant wash baths for 1536 pintool transfers (ref.). We have collaborated with Molecular Devices Corporation to replace the delivered stagnant wash bath with a commercially available recirculating sonicator.

## **"Real Time" Process Control of HTS Assays using a Vision Detection System**

Jason Cassaday  
Merck & Co.  
North Wales, PA

Currently on our HTS platform we have implemented AutoQC - a process control system which automatically calculates plate statistics and compares the values to user define thresholds on a pass/fail basis. If the threshold is not met and a plate fails, an email message is sent to a team of principal operators who initiate an appropriate sequence of response actions. This type of process control does not occur in real time, dispensing problems (leaking tips, clogged tips) happen much earlier in time relative to the data production resulting in many plates having been affected. We have collaborated to develop a Vision Inspection System (VIS-1) to defend against dispense errors. This system may identify liquid drops on top of the plate as well as the presence of empty and partially filled wells. The plate dispense is followed by vision inspection at the dispenser, image analysis, and pass/fail criteria is determined. If a fail status is identified, a real time notification occurs alarming the principal operator.