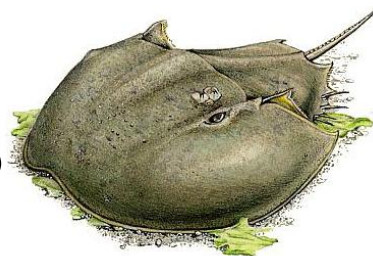


LIMULUS



NEWSLETTER

Department of Biological Sciences, Wagner College, Staten Island, NY

Volume 2010, Issue Fall-02

October, 2010

LETTER FROM THE EDITOR

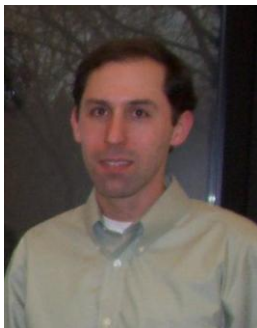
With midterm just over, the fall semester appears to be heading with full speed towards Thanksgiving and the “final stress”. Although some call me “junior faculty”, I consider myself in the “middle ages.” These semesters seem to pass by faster and faster as older as I get. I wonder how this appears for students and for “senior faculty”. Students probably think in terms of the spring year and the fall year, whereas for Dr. Anderson and Dr. Rath the semesters probably appear like a week in spring and a week in fall.

Anyways, here is the second LIMULUS of this semester. The various societies were pretty active. We have reports and articles with lots of photos from the Pig Roast, the Breast Cancer Walk, and the MACUB meeting. Noteworthy is also the “Return of Dr. Fischetti” (see page 5+6).

Dr. Horst Onken
The Editor

BIOLOGY STAFF AND FACULTY NEWS

CONGRATULATIONS



This year, Dr. Palestis is one of the recipients of a Faculty Award for Exceptional Performance in the Area of Scholarship. His research addresses certain aspects of the biology of terns. However, he is also very engaged in behavioral studies with zebra fish. All recipients of faculty awards will be honored at the Faculty Awards Dinner on Tuesday, November 16th. More will

be reported in the next newsletter after the awards dinner.

Contributed by Dr. Onken.

BIOLOGY STUDENT NEWS

BIOLOGY CLUB NEWS

The Biology Club completed their off-campus community service event at the annual Breast Cancer Walk on Sunday October 17th at Cloves Lake Park. The Biology Club is in the process of ordering club T-shirts. The ‘Biology Club Raises Awareness for Breast Cancer Pork Roast’ held on October 6th was a huge success (see below for further details). During this on-campus community service event club members were able to raise a grand total of \$482 for a great cause!

Contributed by Farha Rashid



TRI-BETA NEWS

Tri-Beta held their first meeting of the semester on Wednesday September 22nd. Members completed their off-campus community service by participating in the Breast Cancer Walk that took place at Cloves Lake Park on October 17th. Tri-Beta members plan to do community service in the garden later in the semester

Contributed by Farha Rashid

PRE-HEALTH SOCIETY

This semester, the Pre-Health Society has a new president. Senior Biology major Felicia Giunta serves as the club’s president. The organization will have its next meeting on Wednesday, November 10th at 3pm. The club is hosting a guest speaker from the New York College of Osteopathic Medicine. Students interested in obtaining a DO degree are encouraged to attend this meeting to learn more about NYCOM. The location is TBD. For more information, please contact Felicia.Giunta@wagner.edu.

Contributed by Nidhi Khanna

PRE-DENTISTRY SOCIETY

Congratulations to the *Pre-Dentistry Society*, who is now a Student Government recognized organization established during this Fall 2010 semester. President and founder of the *Pre-Dentistry Society*, Gregory Balaes, referred to the society as, “an environment where pre-dentistry students are able to come together in one common place.”

The first annual *Dental Health Promotion Day* was held September 29th, in the Union building. The society handed out 144 toothbrushes, as well as information, and tips on oral hygiene. Donations were also collected for Operation Smile, an organization who focuses their efforts on raising money for surgeries to surgically correct cleft palate and cleft lip. Thank you to all who donated!

The society has partnered with the American Red Cross, and will be offering a CPR Certification class on Saturday, November 6th. Certification is being offered at a discounted cost for all those who are interested. In an interview, Vice President Lenny Giordano stated, “By offering and setting up a CPR certification class available for pre-dental students, as well as all students interested, the Pre-Dentistry Society is making small steps by giving students tools that will aid them in the field, and when applying for jobs.”

For more information, please email gregory.balaes@wagner.edu, or pre-dental@wagner.edu.

Contributed by Gregory Balaes



OPPORTUNITIES

RESEARCH WITH MOSQUITOES AND CRABS

Dr. Onken offers research opportunities for students in the frame of a project in which he collaborates with scientists from Washington



State University, the University of Idaho, and the University of Alberta (Edmonton, CA). The project is funded by the National Institute of Health and studies the physiology of the midgut of larval yellow fever mosquitoes (*Aedes aegypti*). Mosquitoes are vectors of a number of parasites, transmit devastating diseases like malaria, yellow fever and dengue, and are a major threat to the health of billions of people on our planet. The principal investigators of this project address larval mosquitoes, because it appears more straightforward to fight these vectors as long as they are confined in an aquatic habitat.

In collaboration with colleagues from the U.S. (Mt. Desert Island Biological Laboratories, Maine), Brazil (University of São Paulo in Ribeirão Preto, University of Paraná in Curitiba) and Canada (University of Manitoba in Winnipeg) Dr. Onken pursues research with Crustacea related to the osmoregulatory capacities and mechanisms of crabs. Together with Dr. Alauddin (Chemistry) and Professor Beecher (Biology), an ecophysiological study is in an early stage of planning.

Dr. Onken can offer research opportunities for two to three students. If interested contact Dr. Onken in his office (Megerle Science Hall Room 411), lab (Megerle Science Hall Room 406) or via e-mail (horst.onken@wagner.edu) or phone 420-4211.

For the spring semester Dr. Onken offers a work study position related to his work with mosquitoes.

Contributed by Dr. Onken

WORK IN THE GARDEN

Students interested in collaborating in the greenhouse and/or garden during the fall and winter of 2010 are encouraged to contact Dr. Onken (horst.onken@wagner.edu). There is also an official student job for collaboration in greenhouse and garden.

Contributed by Dr. Onken

BE A LIMULUS ASSISTANT EDITOR

We just welcomed the third assistant editor for the LIMULUS: Gregory Balaes. The more students actively contribute, the better the newsletter becomes. Proficient student writers are invited to become assistant editors for the newsletter of the Department of Biological Sciences. If you are interested, please, contact Dr. Onken (horst.onken@wagner.edu).

EXPERIENCES

BIOLOGY CLUB'S FIRST ANNUAL PIG ROAST

The Biology Club made strides against breast cancer by raising \$482 in the first annual *Breast Cancer Awareness Pig Roast* on Wednesday, October 6th. Roasted pork, kielbasas,

veggie burgers, chicken burgers, and pasta salads were served buffet style, as students, faculty, and staff gathered on Guild Patio.



President of the Biology Club, Leonid Denisenko, would like to thank “Sabrina Slater from Co-curricular for helping us put it all together, SGA for providing the resources, and all the members of the Biology Club for working very hard. It was a lot of fun, and we hope to do it again.” As for future prospects of the club, Leonid continued in saying, “The Biology Club is evolving as an organization on campus. I will work very hard in conjunction with our members to bring educational and interesting events to Wagner College. We will show that Science can be a lot of fun.”

Photos from the event:



Ribbons distributed after donation, and pamphlets with information on how to detect breast cancer.



Wagner students, as they enjoy the pulled pork, and the turkey burgers.





Members of the Wagner Community gathered on Guild Patio to spread awareness, and to enjoy the food.



Contributed by Gregory Balaes

ANNUAL BREAST CANCER WALK

The American Cancer Society Making Strides Against Breast Cancer is an annual event that takes place just down the hill from Wagner, in Cloves Lake Park. Hundreds of individuals walk around the park in order to raise money and show their support for the women and men who are diagnosed with breast cancer every year. The Biology Club, Tri- Beta, and Pre-Health society participate in this walk as their off campus community service event each year.



Contributed by Farha Rashid with photographs from Nidhi Khanna

PUBLICATIONS

Jagadeshwaran, U., **Onken, H.**, Hardy, M., Moffett, S. B. & Moffett, D. F. (2010). Cellular mechanisms of acid secretion in the posterior midgut of the larval mosquito *Aedes aegypti*. *Journal of Experimental Biology* **213**: 295-300.

Moffett, D.F. and **Onken, H.** (2010). The Cellular Basis of Extreme Alkali Secretion in Insects: A Tale of Two Tissues. In: *Epithelial Transport Physiology* (ed. George A.





Gerencser), pp. 91-112 . Totowa, New Jersey: Humana Press. ISBN: 978-1-60327-228-5.

PROFESSIONAL MEETINGS

MACUB

On a Saturday morning, a handful of Biology students and faculty traveled to Molloy College where the annual Metropolitan Association of College and University Biologists Conference was held. The conference began with a keynote address made by Dr. Susan S. Kilham, a Professor of Environmental Science at Drexel University gave a lecture about global warming and the mountains of evidence that supports it. She does extensive research that deals with the effects of climate change on various ecosystems.

Biology undergraduate students and Microbiology graduate students gave poster presentations of their research at the conference. Graduate Assistant Michael Gutkin (Microbiology) received acknowledgment at the conference. Gutkin was awarded third place in the graduate category for his presentation that was titled, "Immunofluorescent Characterization of the Cellular Composition in Normal Adult Zebrafish (*Danio rerio*) Optic Tectum.". Professor Corbo, Dr. Alejandra Alonso (College of Staten Island), and Dr. Fulop advised Gutkin with his research. Additionally, Caroline Mroz (Senior, Biology major) was honored as a winner for the Benjamin Cummings/MACUB Student Research Award. The Limulus staff would like to congratulate Mike, Caroline, and all of the other Wagner students who participated in this prestigious conference.

Some photographs from the event:





Graduate

"Exploration of the Regulatory Effects of jadW1, jadW2 and jadW3 in the Biosynthesis of Jadomycin B in *Streptomyces venezuelae* ISP5230." Jeffrey Bertone (Microbiology) and Dr. Roy Mosher.

"Immunofluorescent Characterization of the Cellular Composition in Normal Adult Zebrafish (*Danio rerio*) Optic Tectum." Michael Gutkin (Microbiology), Prof. Christopher Corbo, Dr. Alejandra Alonso (College of Staten Island) and Dr. Zoltan Fulop.

Contributed by Nidhi Khanna

ALUMNI

Dr. FISCHETTI AGAIN ON CAMPUS



Dr. Fischetti who graduated from Wagner College in 1962 received an honorary degree during the commencement ceremony in May 2010. He will return this week again to Wagner College in order to give a presentation in the frame of the Academic and Cultural Enrichment

(ACE) lecture series.

In the following find a copy of Dr. Fischetti's biosketch as it appeared on the Wagner College website and the announcement for his ACE presentation this coming week.

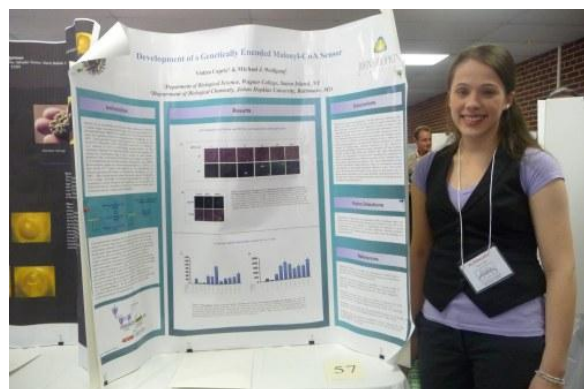
Vincent A. Fischetti, Ph.D.

Professor and Head, Laboratory of Bacterial Pathogenesis and Immunology, Rockefeller University, New York, NY

More than 90 percent of all infections begin at a mucous membrane site (oral, nasal, upper or lower respiratory, ocular, intestinal or urogenital). The Fischetti lab is working to understand the earliest events that occur when gram-positive bacteria interact with human tissues and cause disease. Its research is aimed at interfering with these events by: developing vaccines to induce a mucosal immune response; blocking the attachment of surface protein in the bacterial cell wall to prevent infection; and using phage lytic enzymes to both remove colonizing pathogenic bacteria to prevent infection and treat established infections.

Dr. Fischetti works with gram-positive bacteria, such as streptococci, that do not contain a second cell membrane outside of the cell wall. In the fight against infectious disease, Dr. Fischetti investigates two nonantibiotic treatment strategies. This two-pronged approach involves blocking bacteria from attaching to cells and exploring the use of phage lytic enzymes to remove pathogenic bacteria once they have colonized in the host.

To infect their host, bacteria use their surface molecules to attach and invade human tissues, particularly those that line the nose and throat. Knowledge of the process bacteria use to anchor these molecules in their cell wall could lead to strategies to prevent infection. The M protein is a surface



Below is a list of all of the students and their presentations:

Undergraduate

"Chromosomal Aberrations Caused by the Chemotherapeutic Agent Mitoxantrone on In vitro Human Peripheral Leukocytes." Roseanna Valant (Senior Biology major) and Dr. Ammini Moorthy.

"Development of Genetically Encoded Malonyl-CoA Sensor." Violeta Capric (Junior Biology major), Dr. Michael Wolfgang (Johns Hopkins University). Wagner College faculty advisor: Dr. Onken.

"Production of Zebrafish (*Danio rerio*) Embryos using In Vitro Fertilization Techniques." Caroline Mroz (Senior Biology major), Dr. Ammini Moorthy.





protein that is the major virulence factor of group A streptococci because of its ability to impede attack by human white blood cells. Analysis of this molecule by Dr. Fischetti's lab shows that the region used to attach the M protein to the cell surface is highly conserved in gram-positive bacteria, indicating that the mechanism for anchoring surface proteins in bacteria is also conserved. Since bacteria cannot cause infection without their surface proteins, a molecule that blocks surface protein attachment will be broadly applicable to different gram-positive bacteria.

Dr. Fischetti's lab has also shown that the M protein can be used to deliver the molecules to the surface of gram-positive bacteria to be used as a vaccine. A vaccine that employs this approach could be used against a variety of harmful pathogens and is currently being tested in clinical trials. Dr. Fischetti has also identified a membrane-associated enzyme responsible for cleaving the highly conserved anchor region of surface proteins. Inhibition of this enzyme prevents both cell wall assembly and the proper attachment of most surface proteins, resulting in nearly naked bacteria. Studies are under way to further define the role of this enzyme in cell wall assembly and the protein attachment process to identify inhibitors that may be used as a new class of antibiotic.

As new antibiotics are proving futile against resistant strains of bacteria, the Fischetti lab is investigating the efficacy of lytic enzymes, which are found exclusively in viruses called bacteriophages (or phages), viruses that infect bacteria.

Dr. Fischetti's lab has recombinantly produced lysins that will kill the major gram-positive pathogens — *Streptococcus pyogenes*, *Streptococcus pneumoniae*, *Staphylococcus aureus*, *Enterococcus faecalis* and *Bacillus anthracis* — and has used these proteins to destroy their respective bacteria in animal models of disease. The enzymes are extremely potent; only very small amounts are needed to destroy millions of organisms within seconds of contact. They are also highly specific and unlike antibiotics, only kill the disease-causing bacteria without harming the beneficial bacteria. Dr. Fischetti's studies have shown that when small amounts of the enzymes are administered to mice that have intentionally been infected with these bacteria, the disease-causing bacteria are rapidly destroyed. In an animal model of pneumococcus pneumonia, Dr. Fischetti has shown that systemic administration of the phage enzyme Cpl-1 can rescue mice infected with the pathogen and completely reverse lung tissue damage if given within 24 hours post-infection. Fischetti and his colleagues showed that when the enzyme is delivered to the brain of mice with pneumococcal meningitis, it effectively removes the organisms from the site. The lab has also shown that by removing colonizing *S. pneumoniae* from the nose of mice, they could completely prevent secondary ear infections triggered by influenza.

Using lytic enzymes as a tool, Dr. Fischetti's lab developed a method of drilling through the thick cell walls of gram-positive bacteria while keeping them intact. The technique enabled the Fischetti lab to access the bacterial cytoplasm with labeled antibodies to study intracellular molecules that were previously inaccessible.

CAREER



Dr. Fischetti grew up in New York City, receiving his B.S. in bacteriology from Wagner College in 1962 and his M.S. in microbiology from Long Island University in 1967. He received his Ph.D. in microbiology from New York University in 1970. Dr. Fischetti came to Rockefeller as a postdoc in 1970 and became assistant professor in 1973, associate professor in 1978 and professor in 1990. In 1987 Dr. Fischetti received a 10-year National Institutes of Health MERIT Award that was renewed in 1997.

USING WHAT PHAGE HAVE LEARNED TO CONTROL GRAM-POSITIVE BACTERIA

**ACE Presentation by Vincent A. Fischetti, Ph.D.
Laboratory of Bacterial Pathogenesis and Immunology, Rockefeller University, New York, NY**

**THURSDAY, NOVEMBER 4TH, 4:20 P.M.,
WAGNER COLLEGE, SPIRO HALL, ROOM 2**

Dear Alumni,

If you are interested in contributing to our newsletter, you are very welcome to do so. Contact Dr. Onken by e-mail (horst.onken@wagner.edu) with your submission, comment, ideas or questions! We are excited to hear about where you are, how and what you do!



CARTOONS



Terrierists

Cartoon from www.lab-initio.com



"You're a selfish bastard, Lewis! Those stem cell lines were meant for people who've LOST an organ!"

GUIDELINES FOR CONTRIBUTORS

Authors in all sections should keep in mind that not all readers are specialized in their area of interest. Keep your contribution on a level that everybody can understand.

Contributions may vary in length between about 50 and 500 words and must be submitted by e-mail to horst.onken@wagner.edu. Photographs or other images that accompany an article are very welcome, but must be submitted as separate files (high quality jpg is the preferred file format) attached to the e-mail. Be aware that photographs/images may be minimized in size.

Indicate the section of the newsletter where you want your contribution to appear.

The deadline for submission of a contribution is the 20th of the month. Contributions received later may or may not be considered.

The editor reserves his right to edit your contribution or post an immediate response.

Editing may involve to publish contributions in other sections as indicated by the author.

All contributions will clearly indicate the author's identity.

All contributions are reviewed and publication may be refused by the editor.

The Editorial Board:

Editor: Dr. Horst Onken, Associate Professor

Assistant Editor: Stephanie Rollizo, Dept. Secretary

Student Assistant Editor: Nidhi Khanna (Biology)

Student Assistant Editor: Farha Rashid (Biology)

Student Assistant Editor: Gregory Balaes (Biology)

Student Assistant Editor: WANTED!

