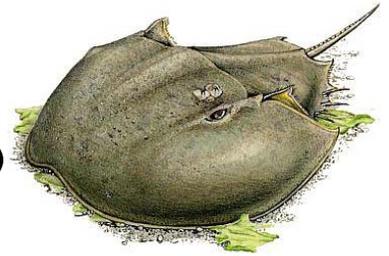


Lumulus



NEWSLETTER

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

Volume 2012, Issue Fall-02

November/December, 2012



Finishing their Senior RFT this December. Sitting from left to right: Brittney R. Ayala, Gina M. Auricchio, Alisa Ndokaj. Standing from left to right: Paul J. Ranieri, Daniel Golembe, Elaina Tsimbikos, Juliana Schipani, Joseph A. Reynolds, Corey E. Gaylets, and Dr. Stearns (RFT Coordinator). Not pictured: Felicia Rubertone.

TABLE OF CONTENTS

Biology Staff and Faculty News	2
Biology Student News	2
News from Clubs and Societies	2
Experiences	4
Opportunities	7
Publications	7
Professional Meetings	7
Alumi	8
Cartoon	8
Guidelines for Contributors	9

LETTER FROM THE EDITOR

A tough year is coming to an end for the Department of Biological Sciences. Dr. Mosher's passing and Dr. Moorthy's accident have and will continue to impact the work of our department. Hurricane Sandy has disrupted the fall semester and affected students, faculty, and alums. However, better times are to come! Happy Holidays and the best wishes for 2013!

Best regards,
Dr. Horst Onken, The Editor





BIOLOGY STAFF AND FACULTY NEWS

Dr. MOORTHY, GET WELL SOON!

Dr. Moorthy shattered her kneecap earlier during this semester. After surgery and rehabilitation, she is now recuperating at home. Dr. Moorthy will most likely only be able to return to Wagner College for the next fall semester. On Wednesday, December 5, she was visited by some colleagues from Wagner:



From left to right: Zoltan Fulop, Marilyn Kiss, Mohammad Alauddin, Brian Palestis, Zohreh Shahvar and Stephanie Rollizo. Professor Moorthy on the right.

Contributed by Dr. Onken with the Daily Bulletin Photo of the Day from 12/12/12

Dr. ONKEN APPOINTED NEW MARTHA MEGERLE CHAIR

Dr. Horst Onken was appointed to Martha Megerle Chair for the academic years 2012/13, 2013/14 and 2014/15.



Contributed by Stephanie Rollizo with photographs by Anna Mulé

LATE BREAKING GOOD CHRISTMAS NEWS

According to an e-mail from Dr. Palestis, the department got the approval from the provost, Dr. Lily McNair, to search for a full-time tenure track replacement for Dr. Roy Mosher. Moreover, the department can hire a visiting professor substituting Dr. Moorthy while she recovers from her accident.

Contributed by Dr. Onken



BIOLOGY STUDENT NEWS

JANNA DENISENKO RECEIVES AWARD

Congratulations to Janna Denisenko for being awarded a \$500 Grant from the Beta Beta Beta Research Foundation. She will present her research at a Tri Beta convention in the Spring. Janna's research advisor is Dr Moorthy.

Contributed by Stephanie Rollizo

NEWS FROM CLUBS AND SOCIETIES

TRI-BETA BIOLOGY HONORS SOCIETY

On December 3rd, the TriBeta Biological Honor Society held its second annual faculty lunch. Donations were collected to



give to families in need during this holiday season. It was a great afternoon with great food and Professor Raths being the winner of the gift basket raffle. As its community service for the semester, the society also kept out collection boxes for canned foods. Students and faculty donated boxes full of food and all the food was donated to a local shelter. TriBeta looks forward to next semester for upcoming e-board elections,

more community involvement and induction of new members.

Contributed by Janna Denisenko

PRE-HEALTH SOCIETY



This semester, the Pre-Health Society engaged in numerous on-campus and off-campus activities.

To highlight one event in particular, on November 26th, 2012, fourteen members of the Pre-Health Society visited **Touro College of Osteopathic Medicine** (TouroCOM) in Harlem, NY. We started our visit off by attending a clinical immunology lecture, where we learned about the difference between the innate and acquired immune systems, T-cells, B-cells, dendritic cells and macrophages. In addition to that, we learned about different autoimmune diseases, such as Grave's disease, and the physiology behind them. Many students were surprised at how dense the half-hour immunology lecture was and realized that the pace of medical school is extremely different than that of undergraduate.

After our immunology lecture, we visited TouroCOM's cadaver lab, where we had the opportunity to touch and take apart a human cadaver. Before entering the lab though, we were taught that it is an honor and a privilege to study a cadaver because these individuals donated their bodies to science, and, for that reason, they must be given the utmost respect. In the lab, medical students and professors helped explain the anatomy and physiology of different organs as we



studied the body. “Dissecting the cadaver was an amazing and life-changing experience. As we were studying the body, we were practically diagnosing the cadaver; we realized that this person had an enlarged heart and was a heavy smoker.” says Khaled Mekki '16.

After our time in the cadaver lab, we had an admissions information session with Mr. Joseph Perez, the director of admissions at TouroCOM. He described the attributes that he looks for in an applicant. For example, he said that the biggest determinant of a student’s success in medical school is his/her MCAT score. Also, he and other members of the admissions committee look for honest, passionate and driven applicants. After the admissions information session, we had a Q&A session with current medical students as well as a tour of TouroCOM facilities.

Samantha Peckham '16 reflects, “It was great to go into the cadaver lab and get a preview of life is like in medical school. Visiting TouroCOM piqued my interest even more for medicine and my motivation to do well at Wagner.”

It was an honor to serve as the Pre-Health Society president this fall semester, and I’d like to thank each and every member of the organization for their kindness and continued support. I wish you and your families a warm and safe holiday season! Should you have any questions or concerns, please feel free to email me at pakinam.mekki@wagner.edu.

Contributed by Paknami Mekki



On October 13, 2012, the Pre-Health society under Paki Meki’s lead got the chance to see what medical school is like by visiting the prestigious Mt. Sinai School of Medicine on the upper west side of Manhattan. The visit was an informative and valuable experience, but also the planning on Meki’s part was outstanding – she is under-credited for it and deserves the applause for organizing this trip for Wagner pre-med students, to even have the chance to see a medical school open house – an occasion that is quite rare.

The open house was an open forum held in the school’s auditorium. Dr. Sharon Battista, and psychiatrist and graduate of Mt. Sinai introduced the open house, the faculty, and the



medical students who would speak. Dr. Gary Butts, the dean of Mt. Sinai, gave inspiring insight and expectations of medical students. He said, “We all have a story – YOU have a story, that personal stories overlap with social experiences, stories that resonate of struggle, and that an individual can ultimately find a place to commit his interest to do good work in medicine”. Dr. Butts emphasized how important diversity is in science and in education, that diversity is a calling at Mt. Sinai, but that diversity still in this day and age has a relentless barrier that needs to be broken and addressed. Dr. Butts ended his discussion expressing, “Truly achieving diversity anywhere is more than just one person, but the involvement between everybody”.

Wagner pre-med students got invaluable advice on how to prepare for Medical School from Dr. Miesha Frempong, a pediatric ophthalmologist. Dr. Frempong dispelled the ways to becoming a doctor, the lessons and wisdom learned, based on her experiences on the road to becoming an MD. One of the biggest questions she often asked herself is, “Why am I doing this?” a question pre-med students often ask themselves as a reaction to the heavy pre-med coursework and a question of career choice as medicine demands one’s moral and ethical competency. Dr. Frempong talked about the standard topics like study habits, study groups, organization, but she talked about deeper issues a pre-med student wouldn’t normally think about. She talked about support, finding a mentor, a lecturer, or a doctor as a guide. Dr. Frempong urged the students to stay connected to classmates, especially through med-school because during rotations, friendships established in the first 2 years of med-school are disbanded in the hospital. However, the mentor is always there; that was the big emphasis. Another point she added was the importance of asking questions, “fighting to be taught” and also reading, telling the students, “you MUST read” (something that students often don’t do, even for class) because as Dr. Frempong said, “If you don’t read, you don’t know what you don’t know” and the questions won’t matter. Dr. Frempong concluded her presentation by talking about personality development, gratitude, and reputation. She expressed how important it is for medicine to have substance. She asked the students to be thankful for opportunities and in the future, be present with a patient, and to be direct and honest with him, be familial in the unique position of dealing with life and death, a privilege that must be handled preciously. And lastly, keeping a reputation in good standing as Dr. Frempong put, “if you’re good, always be good”.

After Dr. Frempong’s speech, Dr. Valerie Parkas talked about the admissions process. She said that although the average MCAT score is a 35.7 among admitted students, the MCAT score doesn’t reflect the range of scores from which a pre-med student can be accepted into medical school. In fact, it’s the personal statement that really counts because it is the personal essay that admissions can look for the passion for medicine, and the grit and courage that an applicant exemplifies. Admissions “looks for you”. Of course a great MCAT of above a 30, a high GPA, clinical and volunteer involvement, and research helps to be admitted, but with a great and passionate personal statement, the first glance to who an



applicant is, can provide a great leniency to the MCAT score. Dr. Parkas accented that medicine is a calling; it's not for everyone and demonstrating that in the personal statement, will make an applicant shine.

The open house ended with an open panel with Mt. Sinai's med students, a diverse and exuberant group of young adults, and then a tour of the school and the dormitories (the cheapest apartments in NYC, exclusive for Mt. Sinai med students). The students' exuberance equated with the description they gave of Mt. Sinai, that it feels like a summer camp. There is a universal feeling of camaraderie and autonomy at Mt. Sinai, one's voice is heard, and everyone is together in the road to becoming a medical doctor.

Contributed by Philip Fomina

EXPERIENCES

SANDY



Hurricane Sandy on Monday, October 29. The prediction of its pathway and the possible impact were accurate. Very fortunately, the college administration reacted promptly, canceling classes and sending students home. Only 59 students (out of 1,400 resident students) spent the storm in the gym together with President Richard Guarasci, his wife Carin, and an emergency team. On Wednesday, October 31, after Sandy had passed, Lee Manchester's update read: "All is well at Wagner College, although we still do not have power on campus. The very few students who weathered the storm on campus made it through the night in their rooms, even though we only have emergency lights in the hallways. Meals are being served for these students and the emergency staff who are working to clear debris, repair our internal computer network and get the phones working." Classes started again on Monday, November 5, and many students participated in relief efforts for the community, for example through wagnercares.org.

As all of the readers have suffered to some degree from Sandy, it would be beyond the scope of this newsletter to even only summarize the impact of this storm on our community. Instead, I would like to highlight one example of an alumn of the Department of Biological Sciences, Howard Schneider.



Howard, on the left in the photograph, recorded the impact of Sandy on his neighborhood on the Rockaways and posted photographs of "The Day of the Storm", "The Next Day", and "The Volunteers and the Cleanup" at <https://sites.google.com/site/hurricanesandyphotosrockaways/>

Contributed by Dr. Onken

THE TREE OF LIFE: TEACHING OF EVOLUTION AND GENOMICS:SUMMER WORKSHOP AT NYU

This summer I was fortunate enough to attend a stimulating one-week seminar/workshop on "The Tree of Life: Teaching Evolution and Genomics" in New York City, courtesy of the Faculty Resource Network (FRN) of the New York University. The FRN of NYU was established in 1984 to help small Liberal Arts Institutions by providing their faculty members with professional development opportunities in the face of limited human and financial resources.:



Wagner College joined this network in the early 1990s when Dr. Eleanor Rogg was the Provost. Over the years many Wagner faculty from different departments have participated and benefited from this affiliation. FRN's award winning and nationally recognized programs have to date provided opportunities to more than 16,000 faculty members from colleges and universities across the USA. Faculty members

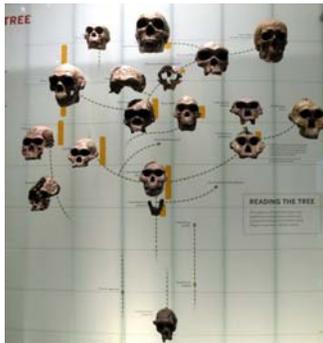




participating in these programs are expected to take back their acquired knowledge and use them to benefit their home institutions.

What is the Tree of Life anyway? Here I am using the term strictly in the context of Biological Sciences. A little bit of background before I share my experience.

Back in 1859 Charles Darwin in his epic book *The Origin of Species* included just one illustration; a tree depicting branching and extinction through time. The idea behind this was that species share common ancestors at various points in time and that this relationship among all living organisms can be portrayed as a “Tree of Life”. Since then there have been many attempts to portray the Tree of Life (TOL) with tree-like diagrams based on similarities in the structure and form of organisms.



The discovery of DNA/RNA, the identification of genomes and advances in computer technology have given rise to specialized fields of Bioinformatics (application of computer technology to the study of Biology) and Phylogenomics (evolutionary study using the molecular sequencing data of groups of organisms) that offer scientists new ways of defining and constructing the TOL.

During the middle of the twentieth century Willi Henning introduced analytical methods to study phylogenetic relationships.



Molecular biology, systematic and population biology, hereditary (genome level) information are used in testing hypotheses on relationships among organisms are used in the reconstruction of trees. A phylogenetic tree shows the inferred evolutionary relationships among different species based on the similarities and differences among their genetic characteristics and/or physical structures. The taxa (a taxonomic unit in a biological system of classification of organisms) joined together in a tree are assumed to have a common ancestor and in a rooted phylogenetic tree each node



with descendants represents the inferred most recent common ancestors. This is an ongoing process. Will there be a single TOL that is all encompassing? No one knows.

As recognized in the National Science Foundation Workshop documents, “increased knowledge of phylogenetic relationships will improve human health, push the frontiers of comparative developmental biology, meet threats to agriculture and forestry from invasive species and pests, and improve management of our natural resources. Perhaps most important, without substantial growth in our knowledge of the Tree of Life, it will become increasingly difficult and inefficient to manage, understand, and manipulate biological information held in numerous databases worldwide, including the burgeoning information from the genomic sciences”.



The NYU FRN workshop is targeted towards teachers to enable them to learn about the scientific advances and to get hands-on experience in using Bioinformatics tools and it was conducted by Dr. Robert DeSalle, curator in the Sachler Institute for comparative Genomics at the American Museum of Natural History (AMNH) in New York City. He leads a group of researchers working on molecular systematics, molecular evolution, population and conservation genetics and evolutionary genomics across a wide range of life forms. Dr. DeSalle also serves as Adjunct Professor at Columbia University, NYU, and CUNY. He is the author of several books, numerous articles and peer reviews, editor of scientific journals and is well known in the world as an eminent scientist.



The TOL workshop was for a week (June 11-16) and we had 16 faculty members from the mainland US, Hawaii and Puerto Rico. The majority of the participants were Biologists but we also had Biochemists, Chemists and one Bioinformatics specialist; a good mix of people considering the topic we



studied. Most of us who needed accommodation in the city were housed in the NYU dormitory on 12th street between Avenues 3 and 4. It is a good walk to the Washington Square Campus of NYU and requires a subway ride to the AMNH, the two main venues of our activities. The Dorm had the basic minimum conveniences; two separate rooms furnished with a bed and couple of tables and a shared bathroom. On my first day of stay there I suddenly realized how freshman students must feel on their first day at the dormitories away from home. Breakfast and lunch were provided by NYU and we were left to explore the multitudes of dining opportunities in the city, although in reality we had to grab a quick dinner and get back to our assignments (no kidding!).



The Sunday prior to the start of the workshop was the check-in day and the participants in all of the workshops and seminars (there were altogether about 250 participants among the TBD different seminars) met and got to know each other during a nice reception on the 10th floor of the Kimmel Hall at NYU.

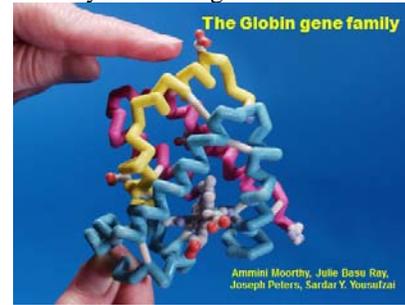
The lecture part of the workshop would start at 9:00AM. We had lectures on Evolution, Genomics, Human Brain, Debunking Race, Bioinformatics and Techniques of Tree building. We toured the Genomics and Systematics Labs at NYU. Additionally we were privileged to tour the various Halls (Human Origin and Evolution, Dinosaurs, Invertebrates, Vertebrates and so on) at the AMNH in the mornings before the Museum was opened to the public.



The pièce de résistance was Dr. DeSalle, the curator himself, escorting us on these tours and sharing his wealth of knowledge on genome-based tree building techniques with us. During the workshop we organized ourselves into groups to tackle our assignments and deliverables. Each group picked a specific topic under the broad TOL theme. My group chose to analyze the Hemoglobin genes, which represent a family of genes, in a group of mammals. There are four types of



Globulin genes (alpha, beta, delta and gamma) that make up hemoglobin and the zeta and epsilon genes manifest themselves in embryonic hemoglobin.



Starting with the possum and selecting four other mammalian groups (cows, monkeys, chimps and humans) our task was to analyze and align the DNA sequences from these genes and the amino acid sequences from the relative proteins leading to the construction of a partial TOL showing the evolutionary relationships among these mammals.

Using the basics of Bioinformatics that we were taught, the book *Bioinformatics for Dummies*, the lessons we learnt on how to access different databases, algorithms and software as well as using novel computational and statistical techniques we tackled our task with enthusiasm. I must admit that some of these topics were quite challenging for me and had it not been for the true teamwork and long hours we would not have completed the assignment. I would like to single out Dr. Julie Ghosh BasuRay, from Dillard University in New Orleans for her invaluable help in coaching me and contributing significantly to the team effort. The final deliverable was a PowerPoint presentation to be delivered to a wider audience on the last day of the workshop. Prior to the presentation we were treated to a grand lunch with the NYU jazz band entertaining us. The presentation was well received and all of us felt gratified and relieved.

The memorable week ended with goodbyes to my new friends and the satisfaction of having learnt new knowledge that would benefit my teaching at Wagner.



Contributed by Dr. Moorthy

In part, the above contribution appeared already in the September Limulus. Unfortunately, the second half of the story was cut out during the editing process. This is why the whole contribution is posted here again.



THUNDERCATS SOCCER

A soccer club dominated by students from the department, the Thundercats, shared exercise, fun, friendship and success during the fall:



In front: Enri Ciosi. Second Row Kneeling: Deeksha Chawla, Maximillian Lucci, Nimrod Philippe, Eric Miller, Meshari Binomar. Third Row Standing: Sarah Sutliff, Benjamin Bustamante, Alex Molesan, Shanti Hellerich, William Rivera, Dilijeta Bajrami, Ashley Polizzotto, Julia Mullins, Julianna Maniscalco.

Contributed by William Rivera

OPPORTUNITIES

RESEARCH WITH DROSOPHILA

Dr. Cook offers research opportunities for students in the frame of a project with the classical insect model organism, *Drosophila melanogaster*. At this time, research in Dr. Cook's lab focuses on endocrine disruptors and their effects on fruit fly development. Please, contact Dr. Cook for further information at heather.cook@wagner.edu.



RESEARCH WITH ZEBRA FISH

Dr. Fulop offers research opportunities for students with an interest in vertebrate neuroanatomy and physiology. Zebrafish *Danio rerio* has become an important model organism for vertebrate anatomy and physiology. Dr. Fulop is an expert in using microscopic techniques for anatomical and physiological research. Please, contact Dr. Fulop for further information at zfulop@wagner.edu.



RESEARCH WITH MICROBES

Dr. Bobbitt and Dr. Corbo offer a variety of research opportunities with microorganisms for students. Both follow different aspects of microbiological research, using a wide array of



experimental techniques. Please, contact Dr. Bobbitt and Dr. Corbo for further information at kbobbitt@wagner.edu or at ccorbo@wagner.edu.

Contributed by Dr. Onken

WORK IN THE GARDEN

Students interested in collaborating in the greenhouse and/or garden during the spring of 2012 should contact Dr. Onken (horst.onken@wagner.edu).

Contributed by Dr. Onken

BE A LIMULUS ASISTANT EDITOR

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).

Contributed by Dr. Onken

PUBLICATIONS

Moffett, D. F., Jagadeshwaran, U., Wang, Z., Davis, H. M., **Onken, H.** and Goss, G. G. (2012). Signaling by intracellular Ca^{2+} and H^{+} in larval mosquito (*Aedes aegypti*) midgut epithelium in response to serosal serotonin and lumen pH. *Journal of Insect Physiology* **58**: 506-512.

Henry, R. P., Lucu, C., **Onken, H.** & Weihrauch, D. (2012). Multiple Functions of the Crustacean Gill: Osmotic/Ionic Regulation, Acid-Base Balance, Ammonia Excretion, and Bioaccumulation of Toxic Metals. *Frontiers in Physiology* **3**:431. doi: 10.3389/fphys.2012.00431.

PROFESSIONAL MEETINGS

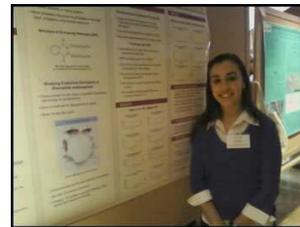
MACUB CONFERENCE REVIEW

The Metropolitan Association of College and University Biologists took place on Saturday, October 27, 2012 at Adelphi University. Three of Wagner's own students attended the conference to present their research. Joanna Emilio, Corey Gaylets and Felicia Rubertone were asked to contribute a brief description of their findings and the significance of their work to share with the Biology department.

Joanna Emilio, *Biology Major, Senior*

Title of Research: Analyzing the Effect of Di-n-pentyl phthalate on the Development and Viability of *Drosophila melanogaster* (Dr. Heather Cook, advisor)

Overview of Research: The effect of endocrine disrupting chemicals (EDCs) on human and wildlife health, reproduction and development has been of growing concern over the past couple of decades. EDCs disrupt the production and/or biological activity of chemical messengers known as



hormones. Since EDCs are found in the environment, food, and consumer products, humans are routinely exposed to these chemicals through ingestion and inhalation. The goal of this project is to test whether the putative EDC Di-n-pentyl



phthalate (DPP) affects the viability and/or development of the fruit fly *Drosophila melanogaster* a classic invertebrate model organism. Our data indicate that 10-10,000 ppm DPP do not affect either fly development or viability. However, preliminary experiments suggest that 50,000 and 100,000 ppm DPP decrease viability and may also disrupt development. Future experiments will analyze the mechanism of DPP toxicity and further investigate the effect of DPP on *Drosophila* development.

Corey Gaylets, Microbiology Graduate Program

Title of Research: Modification of a Yeast Strain Towards the Creation of a Light Activated Elongation Factor (with Johns Hopkins University School of Medicine)

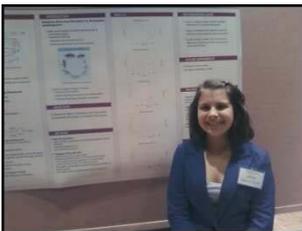
Overview of Research: Corey did his research at Johns Hopkins last summer during a 10-week internship. He worked in a lab with Dr. Brendan Cormack who specializes in yeast and yeast genetics. His project involved deleting two copies of a gene necessary for protein synthesis from the genome of *Saccharomyces cerevisiae* and transforming a plasmid containing a copy of the gene. The long-term goal of the project is to modify the gene further with a protein domain from plants called a LOV domain to create a version of the protein only functional in light. This would create a strain of yeast dependent upon light for growth.



Felicia Rubertone, Biology Major, Senior

Title of Research: Analyzing the Effect of BPA on Viability and Development of *Drosophila melanogaster* (Dr. Heather Cook, advisor)

Overview of Research: Felicia did her research on Bisphenol-A, an endocrine disrupting chemical, and wanted to see whether or not the chemical would affect viability, reproduction and/or development in *Drosophila melanogaster*, the fruit fly. What we hoped to see was that the chemical was negatively impacting either or any of these three categories, whether it was killing the flies, hindering their reproduction or preventing normal development. What we found was a noticeable trend that the chemical was, in fact, affecting male viability. The chemical was killing more males than females. There was no noticeable effect on reproduction or development in our trials. Though the data was not significant when tested with a one-way ANOVA, the trend shows us that if further experimentation is done, we may wind up accumulating enough data to reach significant results, which would be a great breakthrough for us.



Contributed by Janna Denisenko with photos by Stephanie Rollizo



ALUMNI

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!

CARTOON



"Well no wonder you haven't been feeling too well lately Santa - you're 96% cholesterol."

Cartoon from www.lab-initio.com

The editors of the LIMULUS wish every reader **HAPPY HOLIDAYS** and all the best for a healthy and successful 2013!



The Editorial Board:

- Editor:** Dr. Horst Onken, Professor
- Assistant Editor:** Stephanie Rollizo, Dept. Secretary
- Student Assistant Editor:** Janna Denisenko (Biology)
- Student Assistant Editor:** Pakinam Mekki (Biology)
- Student Assistant Editor:** Philip Fomina (Biopsychology)



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*

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Student Assistant Editor: Janna Denisenko (Biology)

Student Assistant Editor: Pakinam Mekki (Biology)

Student Assistant Editor: Philip Fomina (Biopsychology)

Student Assistant Editor: WANTED!

