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# ALI "QUOTES"

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## *From the Chair*

By Kitty Wagner, 2010 Chair

It's time again to see out the old year and welcome the new. 2009 has been an eventful year for PACS. Our chair, David Carrick, was transferred to the Midwest in mid-year after arranging a series of programs with topics as varied as tuberculosis, vanilla, patent medicines, antioxidants, and fried foods. He joined us for as many as he could. *Thank you, David.*

Special thanks to Louise Lawter, Lynne Greenblatt, and Jonathan Chun for stepping in when David wasn't available. Lynne arranged well-attended programs on green materials (from chicken feathers!) and on nuclear power. Jonathan organized an excellent program on alternative careers in chemistry that impressed both the teachers and the students at our education night. Louise was there, wherever and whenever needed, serving as both glue and graphite: holding things together and making things move more easily. *Thanks Louise, Lynne, and Jonathan, and thanks to everyone else who helped make this an eventful year for PACS.*

Something old in 2009: We continued our outreach programs. Fourteen teams (38 students) competed in Chemagination in March, and about two hundred people, and 49 high school volunteers, joined us for our National Chemistry Week Activities Night in October. Something new in 2009: we have a new webmaster. Jonathan Chun passed the torch - or at any rate, the computer keyboard - to Sergio Anis. *Welcome, Sergio.*

2009 has also been an eventful year for many PACS members. Many have undergone profound life changes this year, and some have left the area. I hope that you who remain, especially those of you who are seeking new opportunities, will take advantage of all of the privileges of ACS membership, including the many programs listed on the national website. In 2010, I hope you will remember that PACS is your local section. If you have any suggestions about what the section can do to edify, assist, or entertain you or other section members, or to contribute to the community or the profession, please send them to me or to someone else on the executive committee. I promise to read them all, and I assure you that the committee will consider as many as it can. Meanwhile, new volunteers are always welcome on the Program Committee.

Please help us celebrate the start of a new year with new opportunities by coming to our meetings on January 12 and February 10. John Warner is an excellent speaker as well as a world authority on green chemistry, and I'm delighted that he has added our invitation to his busy schedule (and during his semester off!). Michael Hecht is an excellent teacher as well as a protein chemist on the cutting edge of biology. They both should have something interesting to say. I hope to see you there!

## Monthly Dinner Meeting

## Tuesday, January 12, 2010

*our guest speaker will be*

### John C. Warner, PhD

**President and Chief Technology Officer**
**Warner Babcock Institute for Green Chemistry**

### "Green Chemistry through Entropic Control in Materials Design"

Time: Lecture 6:00 PM; dinner following
Lecture: Friend Center Auditorium, Princeton Univ.
Dinner: Friend Center Convocation Room

**Abstract**
The traditional construction of materials is usually driven by classical synthetic transformations involving the making and breaking of covalent bonds. These processes often require high-energy input and highly reactive and hazardous materials. In natural systems, one typically encounters synthetic control schemes that are based on entropic forces rather than these human-designed enthalpic manipulations. In natural processes, phase changes and triggered mixing are often employed to direct systems towards or away from equilibrium conditions. The recognition of these "natural tendencies" allows one to design processes that have reduced toxicological and environmental impact. This presentation will provide a general introduction to Green Chemistry and describe results in non-covalent derivatization and bioinspired photopolymers that illustrate this shift towards entropic control.

**Biography**
John Warner received his MS (1986) and PhD (1988) in Organic Chemistry from Princeton University. He worked at the Polaroid Corporation from 1988 – 1997 in exploratory research and media research. In 1997 he accepted a position at the University of Massachusetts (Chemistry, Boston Campus, 1997-2004 and Plastics Engineering, Lowell Campus, 2004-2007). John is now President and Chief Technology Officer of the Warner Babcock Institute for Green Chemistry and the Beyond Benign Foundation. He has published over 150 patents, papers and books and is co-author of Green Chemistry: Theory and Practice. His recent patents in the fields of semiconductor design, biodegradable plastics, personal care products and polymeric photoresists are examples of how green chemistry principles can be immediately incorporated into commercially relevant applications. Warner is editor of Green Chemistry Letters and Reviews and associate editor of the journal Organic Preparations and Procedures International. Warner serves on the Board of Directors of the Green Chemistry Institute in Washington DC. He received The 2004 Presidential Award for Excellence in Science Mentoring from President Bush, the American Institute of Chemistry's Northeast Division's Distinguished Chemist of the Year for 2002 and the Council of Science Society President's 2008 Leadership award. Warner was named by ICIS as one of the most influential people impacting the global chemical industries in 2008.

**Reservations**
The meeting will be held at 6:00 PM in the Friend Center Auditorium, Princeton University, which is located on the corner of Washington Road and Olden St. Following the seminar, dinner will be held in the Friend Center Convocation Room. The seminar is free and open to the public. Reservations are required for dinner, which is $20 for members, and $10 for students. All reservations will be billed, for the section pays on the number of reservations, not the number of attendees. Please contact Denise D'Auria at (609) 258-5202 or denised@princeton.edu by Wednesday, January 6 to make or cancel reservations.

## Monthly Dinner Meeting

## Wednesday, February 10, 2010

*our guest speaker will be*

### Michael Hecht, PhD

**Princeton University Department of Chemistry**

### "Toward Artificial Genomes"

Time: Lecture 6:00 PM; dinner following
Lecture: Frick Laboratory, Room 120, Princeton Univ.
Dinner: Kalluri Corner Restaurant

**Abstract**
The entire collection of genes and proteins in all the organisms on earth represents a minuscule fraction of the sequences that - in principle - could encode biological activity. From the enormous diversity of theoretically possible sequences, evolution has selected a very small collection of 'parts' to sustain living cells (only ~4,000 genes in E. coli and ~20,000 in humans.) These considerations might lead to the supposition that genes and proteins capable of sustaining life are somehow 'special.' Is this true? Or can one produce biologically functional macromolecules from artificial sequences that are not

derived from nature, but designed in the laboratory entirely 'from scratch'?

To address these questions, we designed a collection of >1,000,000 de novo proteins (a model 'proteome') encoded by a library of synthetic genes (an artificial 'genome'). The capacity of these artificial parts to encode biological functions was tested by transforming the collection of sequences into strains of E. coli deleted for functions that are required for growth under selective conditions. Surprisingly, several auxotrophs of E. coli were rescued, thereby demonstrating that novel sequences bearing little or no similarity to natural sequences can provide essential biological activities. Moreover, co-expression of several de novo sequences compensates for the simultaneous deletion of several natural genes.

This initial small-scale foray into artificial genomics suggests that (i) the toolkit for biology need not be limited to genes and proteins already existing in nature; and (ii) the construction of entirely artificial genomes capable of sustaining life may soon be within reach.

**Biography**
Michael Hecht grew up in midtown Manhattan. He received his BA summa cum laude in Chemistry from Cornell University, where he worked with Prof. Harold Scheraga. He earned his PhD in Biology from MIT, where he was Prof. Robert Sauer's first graduate student. Hecht then did post-doctoral research with Profs. David and Jane Richardson in the Biochemistry Department at Duke University Medical School. In 1990, Hecht joined the faculty at Princeton University, where is a Professor of Chemistry and holds an affiliated appointment in Molecular Biology. At Princeton, he has served as the Director of Undergraduate Studies, and as the Associate Chair of the Chemistry Department. He has taught courses ranging from Introductory Chemistry, to graduate seminars on protein folding and design.

Hecht's research group works at the interface of chemistry and biology, with current research focused in two areas: The first deals with the molecular determinants of Alzheimer's disease and the search for anti-Alzheimer's therapeutics. The second area of research focuses on Synthetic Biology, and includes projects ranging from the design of novel proteins to the construction of artificial genomes.

**Reservations**
The meeting will be held in Frick Laboratory, room 120, Princeton University. The seminar is at 6 PM followed immediately by dinner at Kalluri Corner Restaurant, 235 Nassau St. Princeton, NJ. The seminar is free and open to the public. Reservations are required for dinner, which is $20 for full members and $10 for students. All reservations will be billed, for the section pays on the number of reservations, not the number of attendees. Please contact Denise D'Auria at (609) 258-5202 or denised@princeton.edu by, Wednesday, February 3 to make or cancel reservations.

## PACS Announces Election Results

*Randy Weintraub* has been elected the section's Chair-elect for 2010. He will become section Chair starting January 1, 2011. Randy is a Principle Investigator/ Team Leader in the Bioanalytical Department at Taylor Technology Laboratories. He has been an active ACS member for over twenty-five years and has served as a Princeton Section Chemagination Judge for the past several years.

Randy earned Masters and PhD degrees at the University of Florida in the areas of food science and human nutrition and environmental analytical chemistry.

*Sharon Sibilia* was re-elected as Secretary-Treasurer. Sharon received her PhD in Inorganic Chemistry from Princeton University in 1997. She currently works for Taylor Technology Laboratories in Princeton, NJ. She has been an ACS member for 18 years and is an active member of PACS.

The full slate of 2010 PACS officers is listed on page 1.

### Are You Still Receiving AliQuotes by Mail?

Please help the Princeton Section save paper and reduce mailing costs. Sign up today to receive the newsletter electronically. Send your email address to Louise Lawter at louise.lawter@gmail.com to start receiving your electronic copy. You can also go to www.princeton.edu/~pacs/subscribe to sign up directly.

### Seeking Volunteers for Program Committee

In an effort to provide better service to our members, the Princeton Section is establishing a program committee to help plan our monthly meetings and other events. If you are interested in serving on the committee, or if you just have a really good idea for a program, please contact chair-elect Kitty Wagner at 609 258-2937 or kmwagner@ Princeton.edu.

## ✎✎✎ 2010 EVENTS & NOTICES ✎✎✎

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| **Thursday, January 14 2-3pm ET.** | **ACS Webinar Thursdays: Your Career Matters!**<br>"Using Your Chemistry Education to Unlock Career Opportunities in the New Decade - A story from the 2010 ACS President" with speaker Joe Francisco, William E. Moore Distinguished Professor of Earth and Atmospheric Science and Chemistry. For more information go to: http://boilthisdown.org/?p=1376 or https://www2.gotomeeting.com/register/211125683 |
| **February 8-11**<br><br>**June 21-25** | **ACS Announces 2010 Short Courses**<br>The 2010 Course Schedule has just been posted on the ACS website. See www.proed.acs.org) for complete details on the short courses and other professional development options offered by the ACS. Courses will be held in our area February 8-11 in Woodbridge, NJ and June 21-25 in Philadelphia. You can register online at acs.org. ACS offers a 50% discount for unemployed ACS members who have paid up their dues. |
| **Thursday, March 18** | **Thermo Fisher Scientific Invites PACS Members to 12th Annual Winter Research Symposia**<br>The 12th Annual Winter Research Symposia are mini-conferences whose invited speakers are prominent researchers in the area of vibrational imaging. This free event is beneficial to scientists and researchers looking for an affordable opportunity to learn powerful new applications and network with fellow spectroscopists in an informal workshop atmosphere! As many of cannot afford to travel in this tough economical environment Thermo Fisher Scientific is providing a free full-day program with complimentary lunch. www.thermo.com/rss: Winter Research Symposia<br>www.thermo.com/naevents: North America Events in Analytical Instrumentation |

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