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NESACS

THE NUCLEUS

May 2008 *Vol. LXXXVI, No. 9*

Monthly Meeting

Education Night at Northeastern U.
Professor Angela Belcher, MIT

Esselen Award Address

By Prof. John A. Katzenellenbogen

Medicinal Chemistry Symposium

Cost, Speed and Quality: Emerging Opportunities for Drug Discovery in Asia

Summer Research Report

Bridged Bisindole Carboxylates as a Model for Oxidative O-O Homocoupling
By Stephen D. Fried, Matthew W. Kanan and Daniel G. Nocera

May Historical Events in Chemistry

by Leopold May
The Catholic University of America, Washington, DC 20064

May 2, 1912
B.F. Goodrich Co. was incorporated on this day.

May 3, 1852
F. A. Gooch, who was born on this date, developed the filter crucible known as a Gooch funnel. He researched the electrolytic estimations of metals and distillation for estimating boric acid.

May 5, 1958
Fifty years ago, Albert Ghiorso et al. announced the discovery of nobelium (No. 102) based on work done at University of California, Berkeley, 1958.

May 6, 1871
F. Victor Grignard, who developed the organo-magnesium reagent (Grignard Reagent) used in organic chemistry, was born on this day.

May 10, 1860
Robert Bunsen & Gustav R. Kirchhoff announced the discovery of cesium on this date.

May 17, 1836
Joseph N. Lockyer, who was born on this day, discovered helium in the sun.

May 20, 1857
One hundred and fifty years ago on this date, John J. Abel, the Father of American Pharmacology, was born. He isolated epinephrine (adrenalin).

May 22, 1912
Herbert C. Brown, a researcher in organoboron and carbocation chemistry, was born on this day. He shared the Nobel Prize in 1979 with Georg Wittig for their development of the use of boron and phosphorus-containing compounds, respectively, into important reagents in organic synthesis.

May 24, 1686
Gabriel D. Fahrenheit improved thermometers by using mercury. In 1720 he invented the Fahrenheit temperature scale. He was born on this date.

May 25, 1865
Pieter Zeeman studied the influence of magnetism on the nature of radiation. The magnetic splitting of spectral lines is known as the Zeeman Effect. He shared the Nobel Prize (1902) in Physics with Hendrik A. Lorentz in recognition of the extraordinary service they rendered by their researches into the influence of magnetism upon radiation phenomena.

May 27, 1857
One hundred and fifty years ago, Theodor Curtius, who was a researcher in the chemistry of hydrazines and azides, was born. He discovered the Curtius rearrangement.

May 31, 1912
Julius Axelrod, a researcher on catecholamines shared the Nobel Prize in Medicine or Physiology (1970) with B. Katz and U. Von Euler for their discoveries concerning humoral transmittors in the nerve terminals and the mechanism for their storage, release, and inactivation.

More historical events may be found at the CSW website or Dr. May's website: http://chemistry.cua.edu/may.cfm. ◇

The Northeastern Section of the American Chemical Society, Inc.

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Cover: *Professor Angela Belcher, Germeshausen Professor of Materials Science and Engineering and Bioengineering, Massachusetts Institute of Technology. (Photo: Courtesy of Professor Belcher).*

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THE NUCLEUS

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Esselen Award Address

"Estrogens and Estrogen Receptors as a Nexus of Chemistry and Biology in Health and Disease"

John A. Katzenellenbogen, Ph. D., Swanlund Professor of Chemistry, Department of Chemistry, Faculty Affiliate, Department of Bioengineering and Beckman Institute, University of Illinois at Urbana-Champaign

Estrogens, Hormones with Many Activities that Extend Beyond the Female Reproductive System. While historically considered to be female reproductive hormones, estrogens are now known to be important in both men and women, and to act on many tissues outside of the reproductive system. For example, estrogens regulate lipid metabolism in the liver and remodeling of the skeleton. In addition to performing many beneficial physiological functions, some estrogens can also have pathological effects, such as elevation of clotting factors that enhance the risk of stroke and promoting the growth of certain breast cancers.

The endogenous estrogens, estradiol, estrone, and estriol, are steroids, but estrogenic activity is also found in many other naturally occurring as well as synthetic non-steroidal compounds, such as the bisphenol diethylstilbestrol, the soy isoflavone phytoestrogen genistein, and the mold metabolite zearalenone. Estrogenic activity has also been found in impurities in the pH indicator phenol red, in metabolites of non-ionic detergents, and in components of polycarbonate plastics. Most all of these compounds are phenols of a certain size, but because estrogen activity is found in many structural classes, there is concern that estrogens in the environment might function as endocrine disruptors.

Estrogen Receptors: Mediators of Estrogen Activity and Tissue-Selective Pharmacology. Estrogens act through estrogen receptors, which are ligand-modulated transcription factors present in estrogen target tissues that regulate the expression of hundreds of genes. When estrogens bind to the estrogen receptors, they stabilize specific conformations of these receptor proteins that reflect the size and shape of the ligand. The rigidified external surface features of the stabilized ligand-receptor complex then serve as specific docking sites for coactivator proteins that alter chromatin structure and activate RNA polymerase II, thereby altering the rates of target gene transcription and ultimately controlling cell phenotypic properties. Estrogen antagonists or antiestrogens bind to the estrogen receptors, but they stabilize different conformations that are unable to recruit coactivator proteins; in some cases, corepressor proteins are recruited instead. There are also compounds that have mixed agonist-antagonist activity.

There are two estrogen receptors, ERα and ERβ. ERα is generally the more active of the two ERs, and ERβ often has a restraining effect on the activity of ERα. The two ERs have related structures, yet they are encoded by genes on different chromosomes, and they differ—subtly but significantly—in the way that they bind ligands. They also have different tissue distributions.

Estrogens show unusual tissue-selective pharmacology. Thus, estrogens of different structure do not always have the same balance of agonism or antagonism in every target tissue. For example, the estrogen estradiol is stimulatory in the uterus, bone, and breast, but tamoxifen, while an antagonist in the breast, still stimulates uterus and bone, whereas raloxifene stimulates only bone. While not fully understood, this tissue-selective pharmacology has important implications in the development of estrogen pharmaceuticals, and it is thought to arise from the different constellation of coactivator and corepressor proteins present in the different tissues, as well as the different gene transcriptional programs that are being regulated. Because compounds such as tamoxifen and raloxifene can stimulate responses in one tissue and inhibit responses in another one, it is difficult to classify them as agonists or antagonists. The more appropriate term now used is "Selective Estrogen Receptor Modulator" or SERM.

Estrogen Receptor Structure: A Guide to Designing Novel Ligands of Unusual Structure to Elucidate Estrogen Biology. My research group has synthesized a large number of estrogens as probes of estrogen receptor structure and function, and as useful biological and medical agents. Our overall approach has been guided by X-ray crystallographic structures of the ligand binding domains of ERα and ERβ, assisted by molecular modeling. The crystal structures of these receptors revealed something that we had suspected from structure-affinity relationships we had observed with various estrogens, namely, that while the receptor completely envelops the lig-

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Monthly Meeting

The 888th Meeting of the Northeastern Section of the American Chemical Society

Education Night

Thursday, May 8, 2008

Northeastern University,
360 Huntington Avenue, Boston, MA

4:00 pm NESACS Board Meeting – Hurtig Hall

5:15 pm Reception - (Raytheon Amphitheater)

6:00 pm Dinner

7:00 pm **Award Meeting**, Dr. Marietta Schwartz, NESACS Chair, presiding
Address: "From Nature and back again…Giving new life to materials for energy, electronics and the environment," Prof. Angela Belcher, Germeshausen Professor of Materials Science and Engineering and Biological Engineering, Massachusetts Institute of Technology, Cambridge, MA.

7:45 pm **Presentation of Awards**
Philip L. Levins Memorial Prize
James Flack Norris/Theodore William Richards Awards
Undergraduate Research Fellowships
Undergraduate Grants-in-Aid
Undergraduate Research Symposium
Project SEED Students
Excellence in Teaching at the Secondary School Level
Induction of New Members into *Aula Laudis*
Avery A. Ashdown Chemistry Examination Awardees
Simmons College Prize

Dinner reservations should be made no later than noon, Friday, May 1st. Please call or fax Marilou Cashman at (800) 872-2054 or e-mail at MCash0953(at)aol.com. Reservations not cancelled at least 24 hours in advance must be paid. Members, $30.00; Non-members, $35; Retirees, $20; Students, $10.

THE PUBLIC IS INVITED

Public transportation is strongly suggested. Take the Green Line E train to the Northeastern stop, or the Orange Line to the Ruggles stop. Follow signs to the boardroom or ballroom from there. Or, take the Orange Line to the Mass Ave stop and go up the stairs at the west end of the platform, go through the turnstile and turn right onto the pedestrian overpass. Then make a left at the bottom of the stairs near the Gainsborough Parking Garage. Visit: http://www.campusmap.neu.edu for a map of the Northeastern University Campus. A limited amount of parking will be allotted in the Gainsborough Parking Garage. Please contact Marilou Cashman for a parking pass if necessary. Anyone who needs special services or transportation, please call Marilou Cashman a few days in advance so that suitable arrangements can be made. ◇

Biography

Angela Belcher is a Materials Chemist with expertise in the fields of biomaterials, biomolecular materials, organic-inorganic interfaces and solid state chemistry. She received her B.S. in Creative Studies with an emphasis in biology from The University of California, Santa Barbara. She continued her education at UCSB and earned a Ph.D. in Inorganic Chemistry (1997) under the direction of Professors Galen Stucky and Daniel Morse. Following a year of postdoctoral research in electrical engineering at UCSB with Professor Evelyn Hu, Dr. Belcher joined the faculty at The University of Texas at Austin in the Department of Chemistry and Biochemistry in 1999. Dr. Belcher later joined the faculty at MIT as the John Chipman Professor of Materials Science and Engineering and Biological Engineering in 2002. In 2006, she was appointed Germeshausen Professor of Materials Science and Engineering and Biological Engineering. In 2002, she co-founded the company Cambrios Technologies, Inc.

In 2006, Dr. Belcher was named Research Leader of the Year by Scientific American and was awarded a 2006 Popular Mechanics Breakthrough award. In 2005, she was named one of 10 to watch by Fortune magazine for "how the world will work in the next 75 years." Other awards include the

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Abstract

Organisms have been making exquisite inorganic materials for over 500 million years. Although these materials have many desired physical properties such as strength, regularity, and environmental benign processing, the types of materials that organisms have evolved to work with are limited. However, there are many properties of living systems that could be potentially harnessed by researchers to make advanced technologies that are smarter, more adaptable, and that are synthesized to be compatible with the environment. One approach to designing

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Biography

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MacArthur Foundation grant; a Four Star General Recognition Award (US Army), Presidential Early Career Award for Science and Engineering (PECASE), Top 10 Innovators Under 40 (Fortune Magazine), 2002 World Technology Award (Materials), 2002 Popular Science Brilliant Ten, 2002 Technology Review Top 100 Inventors (TR100), She is a 2001 Packard Fellow, won the 2001 Wilson Prize in Chemistry at Harvard University, 2001 Alfred P. Sloan Research Fellow, received the 2000 Beckman Young Investigator Award, received the 1999 DuPont Young Investigator Award, and the 1999 Army Research Office Young Investigators Award

Her work has been published in many prestigious scientific journals including Science and Nature, and has been reported in the popular press including Fortune, Forbes, Discover, The New York Times, and The Wall Street Journal. ◇

Abstract

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future technologies which have some of the properties that living organisms use so well, is to evolve organisms to work with a more diverse set of building blocks. These materials could be designed to address many scientific and technological problems in electronics, military, medicine, and energy applications. Examples include a virus-enabled lithium ion rechargeable battery we recently built that has many improved properties over conventional batteries, as well as materials for solar and display technologies. This talk will address conditions under which organism first evolved to make materials and scientific approaches to move beyond naturally evolved materials to genetically imprint advanced technologies. ◇

For late breaking news, job postings and the latest meeting and event information please visit us at

WWW.NESACS.ORG

Esselen Address

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and, there is considerable "extra space" above and below the center of the ligand. This "opportunity space" encouraged us to consider generalizing the design of ER ligands by designing simple, often heterocyclic core elements for ligands onto which the requisite phenolic and other arene or alkane substituents could be appended by combinatorial synthesis.

Thus, we have explored a variety of non-steroidal estrogens that are structurally diverse at their core, and in the process, we discovered that several of these structurally novel ligands are highly selective for only one of the two estrogen receptor subtypes, ERa or ERb. Because these receptors have different tissue distributions and different biological functions, these selective ligands are proving to be very useful as pharmacological probes of the functions of the two different ERs. We have supplied them to numerous researchers around the world, and they are now commercially available. We have also diversified the structure and elemental composition of ER ligands, introducing three-dimensional core elements and replacing a carbon-carbon double bond with a boron-nitrogen bond. Some of these novel ligands have unexpected biological selectivities that could be medically important.

Estrogen Dendrimer Conjugates: Novel Tools to Separate the Nuclear (Genomic) and Extranuclear (Non-Genomic) Initiated Pathways of Estrogen Action. In addition to the transcriptional regulatory actions of estrogens working through the ERs in the nucleus (termed genomic activity), certain actions of estrogens that are rapid appear to arise from actions of the ER outside of the nucleus. These non-genomic or extranuclear-initiated effects involve regulation of ion channels, kinase cascades, and cytoplasmic second messenger systems, and they are thought to be mediated by a small pool of ERs that are outside of the nucleus, perhaps associated with clusters of sig-

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Esselen Address

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naling molecules in the cell membrane. Because estrogens act on both pathways, it has been challenging to determine which actions of estrogens are mediated by the nuclear route vs. extranuclear-initiated route, and to probe how these two signaling pathways interact with one another, and with other cell signaling pathways.

To address this problem, we have prepared estrogen conjugates with poly(amido)amine dendrimers. These estrogen dendrimer conjugates (EDCs) have been carefully designed so that the ligand retains good binding affinity for the ER. The link between ligand and dendrimer is also hydrolytically stable, and the abiotic nature of the dendrimer makes it resistant to cellular proteolysis. We have shown that the EDCs are able to activate estrogen non-genomic signaling as well as estradiol. We, and others who have collaborated with us, have used these EDCs as versatile tools for probing these two pathways of estrogen action in breast cancer cells, in the vasculature, in the β-cells of the pancreas, and in other estrogen responsive systems.

Estrogen Receptor as the Target for Endocrine Therapies in Breast Cancer. Elevated levels of estrogen and progesterone receptors are found in many breast cancers, and androgen receptors, in many prostate cancers, and hormones acting through these receptors often stimulate tumor growth. Thus, these receptors can serve as key targets for endocrine therapies involving hormone antagonists or biosynthetic inhibitors of hormone production, that indeed have proven to be very effective in cancer treatment and prevention, with minimal side effects. With breast cancer, however, only about one-third of patients respond to treatment with SERMs such as tamoxifen or raloxifene, or with aromatase inhibitors such as letrozole. As with any targeted therapy, it is important to be able to identify those patients that have the target for the intended therapy, and to determine, as well, whether the target remains functional.

Current standard of care is to determine the level of estrogen receptors in breast tumor biopsies by immunohisto-chemistry. When this measurement shows very low ER levels, which occurs in about one-third of the cases, endocrine therapy is ineffective. ER levels are high in about two-thirds of the cases, but endocrine therapy is successful in only about one-half of these ER-positive cases. Thus, there is a great need to develop better methods to determine whether a breast cancer patient whose tumor is ER-positive will obtain benefit from endocrine therapy.

Designing Radiopharmaceuticals to Probe the Level and the Activity of Estrogen Receptors in Breast Cancer: An Example of Personalized Molecular Medicine. We thought that it might be possible to make a more definitive determination of tumor ER positivity by imaging the receptor in the tumor *in situ*, using *in vivo* imaging with positron emission tomography (PET). To do this, we designed high affinity receptor ligands, labeled with the positron-emitting radionuclide fluorine-18. Because this isotope has a half-life of only 110 minutes, it needs to be produced locally, and the chemistry for labeling the estrogen has to be rapid and efficient, and to function well at the tracer level.

In a longstanding collaboration with researchers at Washington University School of Medicine in St. Louis, we synthesized a series of both steroidal and non-steroidal estrogens labeled with fluorine-18, and we examined their behavior in various animal models for ER-targeted imaging. We have brought one of these compounds, called FES for 16α-[^{18}F]fluoroestradiol, to the clinic. FES shows clear images of ER-positive tumors, the intensity of which correlates well with ER measurements on tumor biopsies. These PET images, which are obtained non-invasively, have greater predictive values of the benefit of endocrine therapies than do the standard immunohistochemical determinations of ER levels. Other groups in the US, Europe, and Japan, are now using FES for PET imaging in women with breast cancer.

Non-invasive imaging of ER levels directly in tumors using FES-PET gives improved predictability of benefit from endocrine therapies, but some tumors that have ER do not respond to endocrine therapies, suggesting that ER may be present but non-functional. To test the functionality of ER, we developed a PET-based hormone challenge test. Women with breast tumors are imaged with 2-deoxy-2-[^{18}F]fluoroglucose (FDG), a glucose analog taken up selectively by most tumors because of their high demand for sugars. FDG imaging is done twice, first before any hormone treatment (baseline) and then after hormone treatment (induced). If the ER system is functional, then hormone treatment should increase the uptake of FDG, resulting in a hormone-induced "metabolic flare", whereas, if it is non-functional, no increase in FDG uptake is expected.

We have done this hormone challenge in two ways and on two groups of patients, and in both cases we were able to show that in almost every case when a metabolic flare was observed in a tumor—that is, hormone treatment increased tumor metabolism—the patient responded to endocrine therapy. The positive and negative predictive values of these tests were ca. 90%, which is a great improvement over standard assays of ER levels in tumors.

PET-imaging hormone challenge tests, such as the ones we have done, can be generalized both in terms of the agents used for the challenge, and the physiological, metabolic, or molecular characteristics of the tumor that are imaged. They have great potential for advancing the promise of personalized molecule medicine, where therapies can best be tailored to the characteristics of individual patients.

Conclusion. The chemical, structural, biochemical, and biomedical studies on estrogen receptors and their ligands that we have undertaken are providing new insights into the broad functions of these receptors in biology and medicine and new opportunities for how they can be used to improve human health. ◇

Interviewing in the Bio-Pharma Industry

By Megan Driscoll, President, PharmaLogics Recruiting
www.PharmaLogicsRecruiting.com
www.MeganDriscoll.com

Part 2 of a 4 part series:

Part 1 - The Telephone Screen
Part 2 - The Face-to-Face Interview
Part 3 - The Scientific Presentation
Part 4 - The Offer Stage

Part 2- The Face-to-Face Interview
In addition to being a strong technical fit for the position you are interviewing for, hiring managers are evaluating you in 3 main areas during a face-to-face interview:

1st - Your appearance
2nd - Your attitude
3rd - Your preparedness

Appearance
The golden rule regarding your appearance is: Wear a suit and dress as conservative as possible. If you are a struggling post doc with no extra money to spare, do not be afraid to check out the consignment stores. The suit does not need to be fancy or expensive, it simply needs to fit you well and be clean. This rule applies even if the company is casual or business casual. No one will ever fault you for wearing a suit.

Interviewees should never wear cologne or perfume as it can be very distracting and to some, even repulsing. If you are a smoker, do not smoke in the clothes you will be wearing or within several hours of the interview's start time. Certainly avoid smoking throughout the day as well. In today's day and age of the health conscious, most people frown upon smokers, so don't put yourself at a disadvantage unnecessarily.

In the end, remember that if you look sharp, you will feel sharp. A professional appearance will allow you to act more self confident.

Attitude
Your attitude throughout the interview process is incredibly important. Think of an interview like a 6-hour play where you have landed the lead role. This is the opening night, so although you have rehearsed for the show, you haven't had any live practice and, like all opening nights, the critics are in the front row waiting to write about how you performed. You are on display all day, so you are going to need to keep your energy and your momentum up.

The first sign of your personality or attitude is your face, so make sure you are smiling. The more you smile the better. Remember, even a fake smile is better than no smile at all. Additionally, remember that people, including myself, do judge others on their handshake, so be sure to use a firm one.

At the end of each of your meetings, tell the interviewer how excited you are about the company and the position. I often ask candidates if they said this and many admit they forget. This is unfortunate. I have worked with hiring managers who have passed on candidates simply because they didn't think the candidate was interested, so if you always tell them that you are, they can not be mistaken.

Exude humility. Arrogance at any stage in your career is ignorance. Some of the most successful scientists I know are humble and gracious. Let your accomplishments speak for themselves. Conversely, don't be a shrinking violet either. No matter what the position is, either a management role or not, interviewers are looking for candidates who can lead. Throughout the day try to work in examples where you have led others.

Never ever speak negatively about your current or former colleagues or companies. Additionally, always try to turn your negative experiences into positive experiences.

Preparedness
The final key to face-to-face interviewing is being well prepared by, "doing your homework." Most candidates don't bother to look into the backgrounds of the interviewers on the agenda and this is a real opportunity lost. In Bio-Pharma, almost everyone has published something, so candidates can always and easily find out information related to their interviewers' research interests. Get the agenda and search those names on PubMed (www.pubmed.gov) or a related database and see if you can scan through the papers they have published. Familiarize yourself with at least one thing about each person you will be meeting and be sure to mention that fact in your

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NERM 2008

Scheduled for June 29 – July 2 in Burlington, VT

NERM 2008, the Northeast Regional Meeting, will be held in the Sheraton Conference Center in scenic Burlington, Vermont, June 29 to July 2. The technical program will feature symposia on topics of particular current or regional interest

The technical program will be complemented with a day focused on continuing education for K-12 chemistry teachers, technical and career development workshops, and social and networking events. Our Chemistry Enthusiasts program will provide entertaining and thought-provoking lectures and discussions aimed at those who have an interest in chemistry but are not full-time researchers.

Symposia topics run the gamut: green and environmental chemistry, 21st century energy, nanotechnology, particles and composites, chemistry of foods, chemistry and Canada, and much, much more.

Visit their web site at http://www.nerm2008.org to register, to reserve a room at the discount meeting rate, and to participate in an exciting, dynamic meeting. Abstract submittal ends May 11. ◇

New Members

Invitation to attend a meeting

You are cordially invited to attend one of our upcoming Section meetings as a guest of the Section at the social hour and dinner preceding the meeting.

Please call Marilou Cashman at 800-872-2054, 508-653-6329 or: Mcash(at)aol.com by noon of the first Thursday of the month, letting her know that you are a new member. ◇

Interviewing

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interview. If you do this, you will truly stand out.

Read through your CV and be sure you can give examples of all the work you have done that you list. Different people gravitate towards different skills, so you need to be prepared to speak about all of it. To that end, don't put experience on your CV unless you can back it up in person. Never pad your resumé; it will make for a very uncomfortable face-to-face interview.

Hiring managers are looking for leadership skills even at the more junior levels of the organization. Be sure to discuss and have prepared at least one project where you exhibited strong technical skills and also one project where you led or mentored others. Feel free to repeat those stories throughout the day if they are relevant.

Finally, understand that you will need to impress everyone you meet, regardless of who they are or at what level they are within the organization. Everyone on that interview team has a voice.

If you are interested in learning more interviewing techniques, please visit www.megandriscoll.com . ◇

4th Annual NESACS Golf Tournament

All proceeds support NESACS programs

Butternut Farm Golf Club
115 Wheeler Road, Stow, MA
www.butternutfarm.com

June 25, 2008

Shot Gun Start at 1 PM
BBQ and Awards Immediately Following

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Fee Includes:
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Prizes including longest drive, closest to the pin, first, second, and third place
BBQ dinner

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$1000	*Tritium*
$500	*Oxygen*
$300	*Nitrogen*

Reservations: contact Amy Tapper and Harry Mandeville at nesacsgolf@gmail.com. Please include all golfers' names and e-mail addresses.

Payment: By check only. Please send your check to:
Marilou Cashman
NESACS Administrative Secretary
23 Cottage St., Natick, MA 01760

Medicinal Chemistry Symposium

Biographies and Abstracts:

Session I. Chemistry & Medicinal Chemistry Outsourcing

Aravind Y Merwade, Ph.D. Director, process development, Wockhardt Ltd, Aurangabad, India

Michael Song, Ph.D., CEO, Beijing PharmaScience, China
michaelsong1982(at)gmail.com

Michael Song received a bachelor's degree in chemistry in 1986 from Shandong University. In 1992, he received a Ph.D. from the University of Wisconsin-Madison, where he worked with Steven D. Burke. He joined Parke-Davis in 1992, and worked in pharmaceutical industry (Parke-Davis/Warner-Lambert/Pfizer) for 15 years. In 2007, he returned to Beijing China and co-founded Beijing PharmaSciences. He serves as President & CEO of Beijing PharmaSciences.

Bringing Value to Its Customers: a Chinese Startup CRO's Approach

With the advantages of excellent human resources, cost-effective and improved IP protection, China has demonstrated to be one of the ideal R&D outsourcing countries. In China, there is a trend to offer from pure customer cost-effective synthetic capabilities and process development to an integrated pharmaceutical service including chemistry, biology and preclinical service. This will be a good opportunity but there will be a big challenge to CRO companies in China for providing such integrated service.

Xiaodong Wang, Ph.D., CEO & President, PharmaAdvance, China
xwang(at)pharmaadvance.com

Founder, CEO and President: Don (Xiaodong) Wang, Ph. D.

- Ph. D. 1994, synthetic organic chemistry, Ohio State University under Professor Leo Paquette
- Senior Research Scientist, Procter & Gamble Pharma, 1994-2000,
  - Involved in programs of Antiarrhythmic, Cardiac Protection, Nasal Congestants, and Migraine Pain
  - Phase III compound, a potassium channel blocker, azimilide, for antiarrhythmia
  - A Phase II compound, alpha-2-adrenergic agonist for nasal congestion and migraine pain
- Chief Scientist and Team Leader, Icagen Inc., 2000-2006
  - Managing and leading programs in CNS disorders, Pain, Inflammation, and Glaucoma
  - Pre-clinical compounds for Learning and Memory Disorder, and Dementia, and for AD/HD
  - Advanced Leads for chronic, inflammatory, and neuropathic pain
  - Helped discover the current phase III compound for sickle cell disease
- **Founder, CEO and President, PharmaAdvance Inc. June 1996-present**

Inventor of 13 patents and co-author of 12 publications and presentations

The Next Wave of Outsourcing in Pharmaceutical Industry and How to Prepare for the Paradigm Shift

Many companies have comfortably enjoyed the cost saving of outsourcing the early stage of chemistry in Asia, but found that it was not powerful enough to accelerate the whole process of the drug discovery. While an increasing number of compounds are being synthesized in Asia, the demands for efficiently transforming these compounds into a clinical candidate or a drug become stronger. To meet these demands, the fully integrated CROs for drug discovery in China are emerging. However, there are certain psychological and technical barriers to be overcome for many companies to fully take advantage of these services. It is essential to ready for this paradigm shift!

Keynote Presentation:

Ge Li, Ph.D., Chairman & CEO, Wuxi PharmaTech., Shanghai, China

Session II. Integrated Discovery Outsourcing (ADME)

CSN Murthy, Ph.D., CEO, Aurigene discovery technologies, Bangalore, India

John Oyler, MBA, CEO, Bioduro, China, US
John.oyler(at)bioduro.com

John is a serial entrepreneur with a track record of success who has started and managed 8 companies and has raised over $US225 million in capital. During his career, Mr. Oyler has been responsible for a wide array of activities including: organization building, partnering with multi-national companies, instigating clinical trials at Sloan Kettering, Sidney Kimmel, and Mass General, licensing and managing intellectual property, building software database statistical capabilities to handle extremely large-scale data, and, most importantly, building highly functional, world-class organizations. In the biotech field John has started

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Medicinal Chemistry Symposium

Cost, Speed, and Quality; Emerging Opportunities for Drug Discovery in Asia

Organized by the Medicinal Chemistry Group of the Northeastern Section, American Chemical Society

Wednesday - May 14, 2008 Holiday Inn, 15 Middlesex Canal Park Road, Woburn, MA

8:15 am **Opening** (Liming Shao, Ph.D.)

8:20 am **Chemistry & Medicinal Chemistry Outsourcing,** (Chair: Raj Rajur, Ph.D)

Title TBD
Aravind Y Merwade, Ph.D. Director, process development, Wockhardt Ltd, Aurangabad, India

Bring Value to Its Customers: a Chinese Startup CRO's Approach
Michael Song, Ph.D., CEO, Beijing Pharma-Science

The Next Wave of Outsourcing in Pharmaceutical Industry and How to Prepare for the Paradigm Shift
Xiaodong Wang, Ph.D. CEO & President, PharmaAdvance

9:50 am **Break**

10:00 am **Keynote Presentation**

Title TBD
Ge Li, Ph.D. Chairman & CEO, Wuxi PharmaTech., Shanghai, China

10:50 am **Integrated Discovery Outsourcing (ADME),** (Chair: Steve Tam, Ph.D., Director of Medicinal Chemistry, Wyeth)

Title TBD
CSN Murthy, Ph.D. CEO, Aurigene discovery technologies, Bangalore, India

Creating world-class capabilities for integrated drug discovery in China
John Oyler, MBA, CEO, Bioduro

Title TBD
Rashmi Barabaya, Ph.D., CEO and Managing Director, Advinus Therapeutics Pvt Ltd

12:30 pm **Lunch**

1:40 pm **Biology & DMPK,** (Chair: Open)

Discovery Biologics: Outsourcing Principles and Considerations
Vincent Ling, Ph.D., VP, Dragonfly Sciences

Current status of integrated pharmaceutical services beyond chemistry services in China
Chunlin Chen, Ph.D., CEO, GLP MPI-Medicilon Research, Shanghai, China

TBD

3:10 pm **Break**

3:20 pm **Managing from Distance, Case Study**, (Chair:Kerry Spear, Ph.D., Executive Director, Drug Discovery, Sepracor Inc.)

The Role of China in Drug Discovery in the 21st Century: A View from the Starting Gate
Kerry Spear, Ph.D.

Creating Value in Drug Discovery through Integrated Chemical Operations
Roger Xie, Ph.D., Associate Director, Sirtris Pharmaceuticals

Long distance marriage of disease biology and systems biology platform for discovery of novel therapeutics
Uday Saxena, Ph.D., CEO and Managing Director, Kareus Therapeutics, Georgia, US
Suri Venkatachalam, Ph.D., Connexios Life Sciences, Bangalore, India

4:55 pm **Panel Discussion**, (**Chair: Kerry Spear Ph.D.)**

Reservations should be made no later than 12:00 noon on Wednesday, May 7, 2008. Please contact Marilou Cashman at (800)872-2054 or (508)653-6329 or mcash0953(at)aol.com Due to the limited space available, the reservation fee must be paid in advance. The fees for the symposia are: Members, $50 (Industry), $28(Academic); Non-members, $60 (Industry), $30(Academic); Retirees, $15; Students, $10. Anyone who needs handicapped services/transportation, please call a few days in advance so that suitable arrangements can be made.

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B. From the West: Take Route 95/128 North to Exit 35 South (Route 38-Main Street. Follow the directions from * above. ◇

Symposium Speakers

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(or re-started, in the case of Genta) several companies including: Galenea (private), Genta (Nasdaq-GNTA), Walden Laboratories (merged into Indeveus -IDEV), Oasis Biosciences (sold to Genprobe -GPRO).Outside of the biotech field John has been involved in starting several companies including: Telephia (sold to Nielsen), Verdisoft (sold to Yahoo). In addition, Mr. Oyler was involved for several years in performance improvement and strategic growth initiatives at McKinsey & Co., the international consulting firm where he spent 1992-3 working in China.

Creating world-class capabilities for integrated drug discovery in China. This presentation will discuss the ability to perform truly integrated drug discovery in China today at high speed and low cost and will share the successes, challenges, and key to success from BioDuro's experiences running these type of programs in 2007 and 2008.

RASHMI BARABAYA, Ph.D., CEO and Managing Director, Advinus Therapeutics Pvt Ltd., India

SESSION III. BIOLOGY & DMPK

VINCENT LING, Ph.D., VP, Dragonfly Sciences, China, US
vling(at)dragonflysci.com

- Genetics Institute / Wyeth - 10 years led laboratory research teams in Discovery Research related to embryonic stem cell development, molecular immunology, and genomic screening.
- Director of Molecular Biology at Compound Therapeutics (now Adnexus / BMS) establishing DNA discovery pipeline.
- Vice President of Dragonfly Sciences responsible for US and China operations, including scientific and business development.

Discovery Biologics: Outsourcing Principles and Considerations

Recent trends suggest that biologics-based therapeutics and reagents are increasing in importance in Drug Discovery. In many occasions, phamaceutical companies and biotech companies are faced with resourcing issues when confronted with biologics research programs that exceed internal capacity. Because of the myriad of experiments involved with early stage discovery biology, oftentimes it may be easier to outsource biology services to accelerate projects internally. This presentation will outline service-based principles and standards to evaluate the compatibility of outsourcing firms to internal research needs.

CHUNLIN CHEN, Ph.D., CEO, GLP MPI-Medicilon Research, Shanghai, China
clchen(at)medicilon.com

Dr. Chunlin Chen received his B.S. and M.S. from China Pharmaceutical University in 1983 and 1986. During 1986-1991, Chun-Lin Chen worked as Assistant Professor in China Pharmaceutical University. In 1994, Dr. Chen received Ph.D. in Pharmacology and Toxicology from Oklahoma State University and then he had post-doctoral training in Pharmaceutical Department of St. Jude Children's Research Hospital. During 1997-2002, Dr. Chen served as Director of Pharmaceutical Department at Parker Hughes Cancer Center, Parker Hughes Institute, St. Paul, USA. In 2002, Dr. Chen joined Vertex Pharmaceuticals as a Staff Investigator at Department of Pharmacokinetics and Metabolism, Non-clinical Drug Evaluation Division, Vertex Pharmaceuticals Incorporated, Cambridge, USA. Dr. Chen was co-founder of Medicilon Inc. Medicilon Inc. is a pharmaceutical research and development company located at Zhanjiang High-Tech Park, Shanghai, China. Dr. Chen served as CEO of Medicilon/ MPI Preclinical Research (Shanghai) LLC, a JV between Medicilon and MPI Research.

Current status of integrated pharmaceutical services beyond chemistry services in China

With the advantages of excellent human resources, cost-effective and improved IP protection, China has come to be one of the ideal R&D outsourcing countries. In China, there is trend to offer from pure customer cost-effective synthetic capabilities and process development to an integrated pharmaceutical service including chemistry, biology and preclinical service. This will be a good opportunity but there will be a big challenge to CRO companies in China for providing such integrated service.

TBD

SESSION IV. MANAGING FROM DISTANCE, CASE STUDY

KERRY SPEAR, Ph.D., Executive Director, Drug Discovery, Sepracor Inc., MA, US
kerry.spear(at)sepracor.com

Dr. Spear is Executive Director of Medicinal Chemistry at Sepracor, a pharmaceutical company headquartered in Marlborough, MA, USA. He is currently in charge of all medicinal chemistry efforts within Sepracor's Discovery Research Department. Trained in natural products synthesis, he has over 25 years of experience as a medicinal chemist in both the pharmaceutical (e.g., G.D. Searle) and the biotechnology (e.g., Chiron) industries. He has participated in or led programs that cover a broad range of drug discovery research and which have resulted in the acceptance by the FDA of 7 IND applications. Dr. Spear completed a postdoctoral fellowship at the University of California, Berkeley. He received a Ph.D. degree in organic chemistry from the University of Wisconsin, Madison and a B.S. degree in chemistry from Juniata College.

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Symposium Speakers

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The Role of China in Drug Discovery in the 21st Century: A View from the Starting Gate

In less than a decade, outsourcing of some aspects of pharmaceutical research to Asia has emerged as an integral part of Pharma's drug discovery strategy. While these efforts initially focused on compound synthesis, recently CROs in China have begun adding in *vitro* and *in vivo* biology proficiencies to complement their core strengths in chemistry. Additionally, by building a deeper leadership pool, these CROs are now poised to contribute drug discovery expertise and knowledge, as well as fundamental chemistry and biology skills. These additional capabilities offer new and broader opportunities for partnering with Chinese CROs in order to accelerate drug discovery efforts and control costs. Efforts to integrate chemistry and biology resources within Chinese CROs with ongoing drug discovery efforts at Sepracor will be discussed.

Roger Xie, Ph.D., Associate Director, Sirtris Pharmaceuticals, MA, US
rxie(at)sirtrispharma.com

Dr. Roger Xie is Associate Director at Sirtris, which he joined in 2005. He currently oversees the Chemical Operations focusing on outsourcing activities. Prior to Sirtris, Dr. Xie held various discovery and Medchem research and program management positions at Daiamed, UCB research, and Sepracor, Inc. Dr. Xie received his B.S. degree from University of Science and Technology of China (USTC) and his Ph.D. degree from Boston College. Dr. Xie has over 20 patents and publications in the areas of organic syntheses, medicinal chemistry and drug discovery.

Creating Value in Drug Discovery through Integrated Chemical Operations

The costs for drug research and development are high. As the demand for contained R&D costs continues to grow, the necessity of outsourcing and off-shoring is becoming of increasing importance. Besides reducing the cost of research, outsourcing in the pharmaceutical sector is a result of Pharma and Biotech companies rationing the internal existing facilities and capabilities. At Sirtris, we are exploring a variety of ways utilizing contract research organizations in Asia and other global territories to create an integrated outsourcing platform that lowers the cost, internal critical mass and time required to discover and develop new therapeutics.

Uday Saxena, Ph.D., CEO and Managing Director, Kareus Therapeutics, Georgia, US

Uday Saxena is the co-founder and CEO of Kareus Therapeutics, an emerging US based company engaged in discovery of new therapeutics for Alzheimer's and other age-related CNS diseases. He has been in the Pharma industry for the last 16 years with executive and leadership positions at Dr.Reddy's Laboratories (Hyderabad, India), a NYSE-listed pharma company, AtheroGenics Inc (Atlanta, Georgia), a NASDAQ listed Biotech Company and Pfizer (Ann Arbor, Michigan). Dr. Saxena has more than 50 peer-reviewed publications and 20 patents to his credit. His expertise is in the therapeutic areas of cholesterol/lipid metabolism, atherosclerosis and inflammation. He obtained his PhD from Memorial University of Newfoundland in Canada and completed his post-doctoral training at Columbia University, New York.

Suri Venkatachalam, Ph.D., Connexios Life Sciences, Bangalore, India

Suri Venkatachalam is the founder and CEO of Connexios Life Sciences, a Bangalore, India-based integrated systems biology driven Discovery Company. Connexios is using this discovery platform to work on several drug and biomarker discovery and development programs in the area of metabolic disorders. Before founding Connexios, Suri was part of the founding team of Metahelix Life Sciences, a Bangalore-based Agri-Biotechnology company. His expertise is in the area of systems modeling and complex systems. He obtained a Ph.D. in condensed matter physics from the Indian Institute of Science, Bangalore, and was a Burroughs-Wellcome post-doctoral research associate in Systems Neuroscience at the University of California, San Diego.

Long distance marriage of disease biology and systems biology platform for discovery of novel therapeutics

Kareus Therpeutics, an emerging US based drug discovery company, and Connexios Life Sciences, an India-based systems biology driven drug discovery company, recently inked a collaboration for discovery of new therapeutics for Alzheimer's disease. This is an unusual collaboration, in that Kareus will provide virtual disease expertise, whereas Connexios will bring to the table its systems platform and perform all the wet biology and chemistry in its labs in Bangalore, India. By doing so, this combination allows the power of using cutting-edge scientific principles in a cost-efficient environment. The collaboration brings together two biology-based skills that are under used in tandem by the industry today. This presentation will describe strategy used in target selection and validation, screen selection and risk-mitigation tactics by combining these two skills. Real-life examples of how this long-distance marriage is working beyond the honeymoon period will be discussed. ◇

Summer 2007 Research Report

Bridged Bisindole Carboxylates as a Model for Oxidative O-O Homocoupling

Stephen D. Fried, Matthew W. Kanan, Daniel G. Nocera
Department of Chemistry.
Massachusetts Institute of Technology, Cambridge, MA 02139

Abstract

Catalysis of oxygen-oxygen bond formation is a preeminent chemical challenge because it is one of the basic steps required to "split" water to form O_2 and H_2.[1] Due to electrostatic [lone pair-lone pair repulsion] and quantum mechanical [orbital overlap] effects, O—O bonds are very weak [around 34 kcal/mol] and are generally rare in nature. Efficient water-splitting catalysis that can be interfaced with photovoltaic devices may provide a powerful technology to store solar energy in the form of chemical bonds.[2] Inquiry into this subject inaugurated a search for organic architectures that could pre-organize two oxy-centered radicals in order to catalyze the formation of a peroxy-bond. We present a new class of complexes – 2,2'-bisindolyl-N,N-alkylated-3,3'-dicarboxylic acids [Figure 2] – as a promising candidate molecule for this purpose. Structural features of these compounds were elucidated by crystallography and NMR studies. Additionally, we report several electrochemical experiments that show the influence of molecular geometry and stereoelectronics on oxidation potentials. These results provide a foundation for subsequent studies to determine the viability of oxidative O—O bond formation with these compounds.

Background

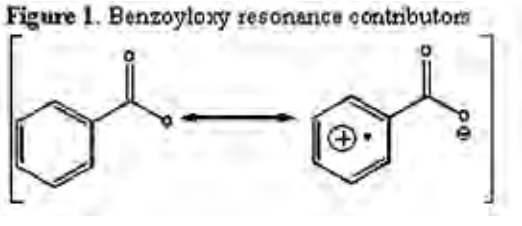
Previous research into O—O bond formation has focused on compounds capable of forming reactive metal oxo species. In nature, O_2 is formed from water in the Oxygen Evolving Complex of Photosystem II.[3] Structural studies by Barber et al. have suggested that the key O—O bond forming step is actuated by nucleophilic attack of a calcium-ion coordinated hydroxide ion onto a high-valent manganese-oxo.[4] As of this writing however, trapping of an electrophilic oxo specie with water or hydroxide has not been generated.

The first synthetic small-molecule reported to catalyze O-O formation from water is the "blue-dimer" V-oxo Ru compound *cis,cis*-$[(bpy)_2(H_2O)Ru^{III}\text{-}O\text{-}Ru^{III}(OH_2)(bpy)_2]^{4+}$, which drives the difficult oxidation with a strong Cerium-based oxidant.[5,6] The identification of the bis $Ru^{V}{}_2(O)$ intermediate $[(bpy)_2(O)Ru^{V}\text{-}O\text{-}Ru^{V}(O)(bpy)_2]^{4+}$ as the active species for O_2 evolution launched investigations into the design of other architectures that support the formation of two high-valent metal-oxos.[7]

The Nocera group at MIT has explored the chemistry of the "Hangman" and "Pacman" complexes as a possible scaffold to provide metal-oxos with the right geometry to form O-O bonds.[8,9]

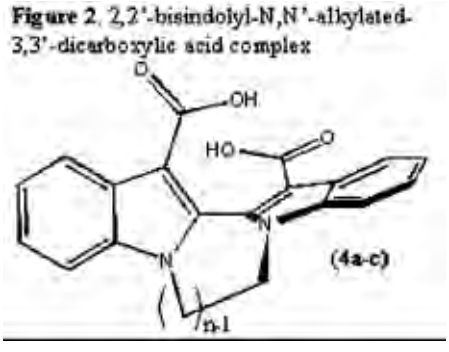
Synthetic organic chemistry furnishes a panoply of tools to construct complexes with rigid geometries and well-controlled reactivities. We targeted organic compounds that upon oxidation would position two oxygen-centered radicals in proximity to each other. Carboxylic acids were chosen as the functional-group progenitors of oxygen-centered radicals because of their low pKa values and because EPR studies of benzoyloxy radicals have revealed that spin density on these species resides nearly entirely on the two oxygen atoms.[10] We hypothesize that appending carboxylic acids to electron rich aromatic systems would provide access to carboxyl-radicals with significant spin density on oxygen atoms at relatively low oxidation potentials and at neutral pHs.

Figure 1. Benzoyloxy resonance contributors



The first generation target complex is shown in Figure 2.

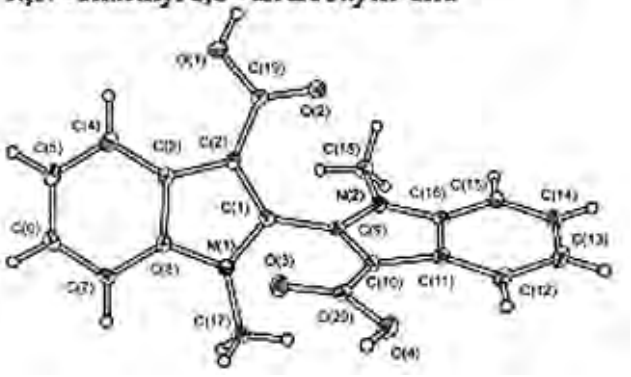
Figure 2. 2,2'-bisindolyl-N,N'-alkylated-3,3'-dicarboxylic acid complex



The 2,2'-indolyl bond is designed to bring two oxygen-atoms into close proximity. Needless to say, the indolyl bond allows for free rotation, and simple mechanical models of the biindolyl system as well as the crystal structure, shown below in Figure 3, show that such a structure would not properly constrain positioning of the carboxylic acid groups to encourage intramolecular O—O coupling. Our

interest moved toward utilization of an N,N'-alkyl-chain liking group between the two indoles as a means of constraining molecular geometry. The synthesis for the complex illustrated in Figure 1 is described in Scheme 1, below.

Figure 3. Crystal structure of 2,2'-bisindolyl N,N'-dimethyl 3,3''-dicarboxylic acid



Synthesis

Alkylation conditions between methyl indole-3-carboxylate (**1**) and diterminal alkylene ditosylates or dihalides were optimized such that for 2-, 3-, and 4- carbon linkers, isolated yields were obtained between 90-95%. The second step of the procedure proved to be the most difficult of the synthesis. To form the 2,2'-indolyl bond, a methodology involving directed metallation and oxidative coupling via an inorganic oxidant was developed. Although other methods of indole-indole coupling are available,[11,12] we chose this method because it does not require prior functionalization at the 2-sites,[13] and therefore allows for a much-desired three-step synthesis. Oxidative coupling transforms **2a-c** to **3a-c** with moderate efficacy. Yields were often limited by the compound's incomplete solubility in nBuLi-compatible solvents. We generally observed the trend that oxidative coupling was more effective with smaller linker chains. Introducing more methylene units allows the system more degrees of freedom, and therefore makes the desired C-C bond-forming transition state more entropically disfavored. The final hydrolysis step readily furnishes the di-carboxylic acid derivatives, **4a-c**.

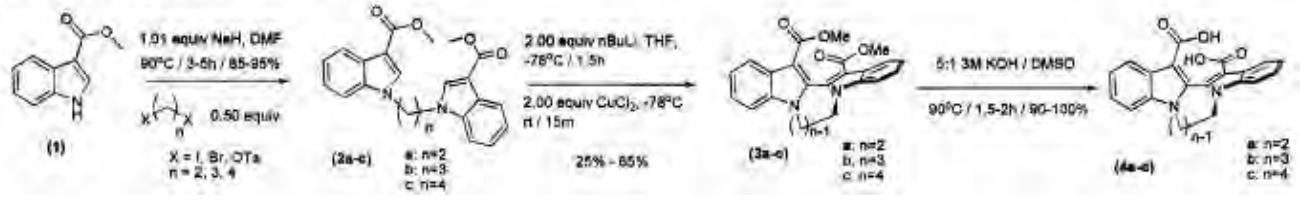
Additionally, another derivative of the complex was prepared with a *spiro*[3.7] group by addition of a cyclopropyl moiety on the linker. We chose to pursue this compound because of the hypothesis that ring strain in the linker would constrain the molecular geometry even further. The synthesis began with commercially-available **5d** [see Scheme 2], and a di-tosylate was synthesized using a preparation described by Foos and coworkers.[14] With the tosylate in hand, indole alkylation was possible under similar conditions described in Scheme 1. Coupling and hydrolysis led to the derivative of interest, completing the first series.

Crystal Structure Analysis

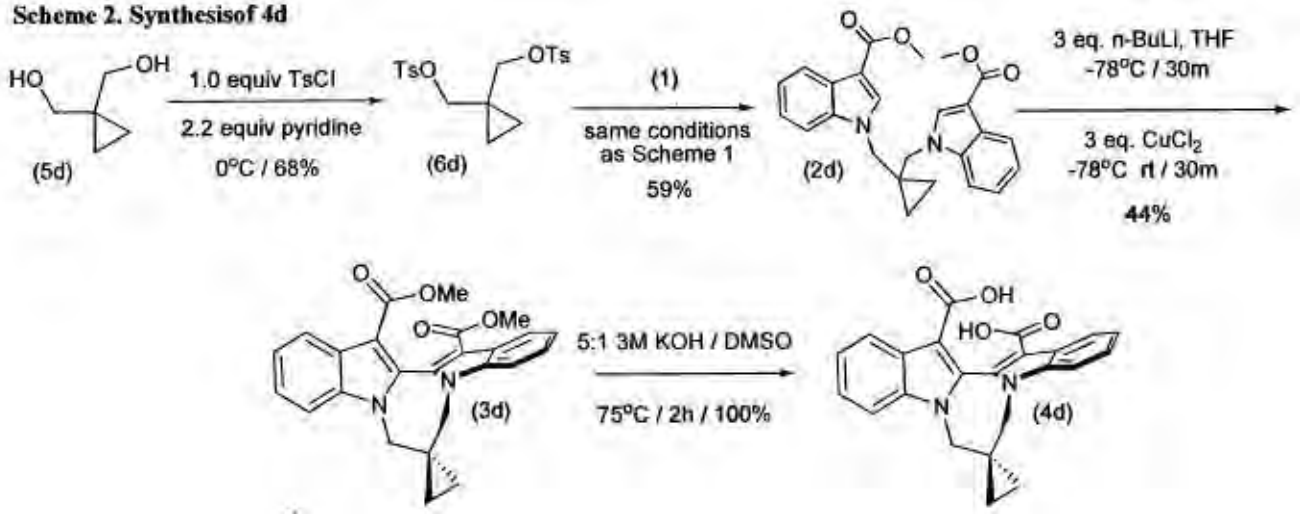
The crystal structures of this series of compounds are shown in Figure 4.

These structures indicate the effect of the bridge structure on the spacing of the two carboxylate groups. An important observation that was not obvious from *a priori* structural

Scheme 1. Synthesis of 4a-c



Scheme 2. Synthesisof 4d



Summer 07 Report

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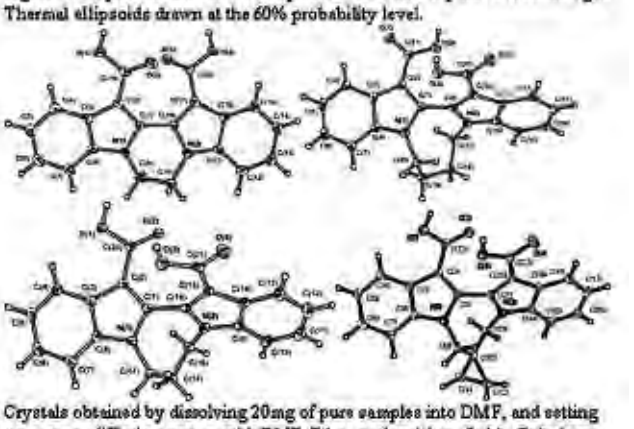
intuition was that the biindolyl system is apparently bent out of planarity in all cases about the 2,2'-indolyl bond. The measure of planarity of the system is the dihedral angle between the two indole-containing planes – i.e., the angle formed by atoms 3-C, 2-C, 2'-C, and 3'-C. Increasing the size of the bridge splays the indole systems farther from planarity, as mechanical models would have suggested. Interestingly, the presence of the cyclopropyl moiety in **4d** causes a small contraction of the dihedral angle relative to **4b**. Minimal O–O bond distances were approximated from the crystal structures, assuming free indole-carboxyl bond rotation and rigidity in the rest of the compound. These data are presented in Table 1.

Figure 4. Crystal structures for compounds **4a-d** from top left to bottom right. Thermal ellipsoids drawn at the 60% probability level.



Crystals obtained by dissolving 20mg of pure samples into DMF, and setting up a vapor diffusion system with DMF-Ether, and waiting ~3-4d. Colorless crystals were formed at the bottom of the inner vial and were then subjected to diffractometry

Table 1. Structural Parameters of Interest from Crystal Data of compounds 4a-d

	4a	4b	4c	4d
Dihedral [degree]	19.0°	59.9°	68.8°	58.2°
O–O distance [Å]	N/A	1.60 Å	2.09 Å	1.74 Å

Solution-Phase Dynamics and VT NMR

In addition to crystal structure analysis, solution phase NMR in d^7-DMF and d^6-DMSO allowed for the acquisition of dynamical structural information. The ^{1}H NMR spectra of the methylene region for each compound are presented in Table 2.

In the dimethylene-bridged complex, all four of the alkyl peaks resonate together as a singlet with a δ=4.92ppm. This observation suggests that on the NMR time-scale molecular dynamics allows for the interchange of all the four protons on the ethylene-linker with one another by fluxional processes – implying that the indole planes can freely assume a range of dihedral angles at room temperature.

In contrast, NMR spectra for **4b-d** demonstrate structural rigidity by virtue of the loss in symmetry in the alkyl proton resonances. To take this argument further, we subjected compounds **4b** and **4d** to VT NMR in order to test if increasing the thermal energy of the environment would induce fluxionality and therefore compromise the structural rigidity of the system. We are interested in determining at what temperature rotation about the indolyl-bond is comparable to the NMR time-scale. As shown in Figure 5, it was found that for compound **4b**, no temperature which our instrument was capable at measuring could degenerate all of the alkyl-bridge protons via allowing for facile rotation about the indolyl-bond. For **4d**, coherence was reached only at 150°C.

Table 2. RT ^{1}H NMR of 4a-c in d^7-DMF and 4d in d^6-DMSO. Note solvent shifts: DMF (2.95ppm, 2.75ppm), and DMSO(2.50ppm).[15]

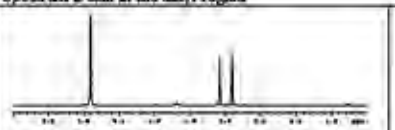
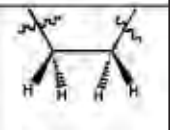
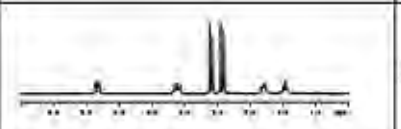
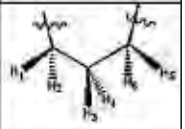
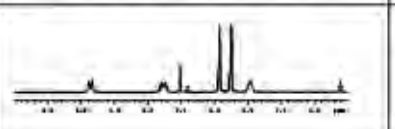
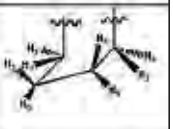
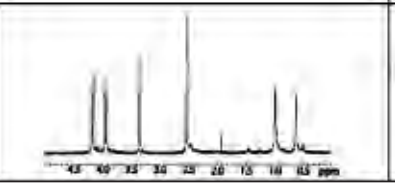
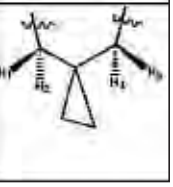
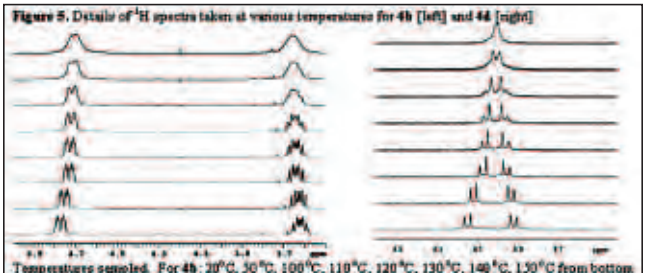
Specie	Spectrum Detail in the alkyl-region	
4a		
4b		
4c		
4d		

Figure 5. Details of ^{1}H spectra taken at various temperatures for **4b** [left] and **4d** [right]



Temperatures sampled. For **4b**: 20°C, 50°C, 100°C, 110°C, 120°C, 130°C, 140°C, 150°C from bottom to top. For **4d**: 20°C, 50°C, 100°C, 110°C, 120°C, 130°C, 140°C, 150°C from bottom to top.

Synthesis of a Water-Soluble Variant

Electrochemical studies on **4a-d** were only possible in polar organic solvents, due to the solubility constraints of the complex. Bulk electrolysis of these compounds at their respective oxidation potentials quantitatively returned starting material; evidently, the oxidized carboxyl-radicals were reactive enough to strip H-atoms from the relatively weak C-H bonds furnished by the solvent, and this process occurred on a time-scale to obviate the possibility of coupling chemistry. These results demonstrated that in order to witness oxidative O—O coupling, studies needed to be conducted in water. The preparation of a water-soluble variant

of complex **4b** was a significant challenge compared to the original syntheses outlined in Schemes 1 and 2. The original strategy of the synthesis was to begin with 5-methoxy indole (**7**) and proceed with a synthesis that would ultimately allow for di-phosphorylation at the extremities of the molecule. To this end, we set out to prepare a potential water-soluble variant as described by Scheme 3.

Employing a high-yielding large-scale reaction, multigram amounts of **7** were easily transformed into its 3-methyl ester relative via electrophilic addition to trichloroacetic chloride, followed by a base-catalyzed haloform reaction, in accordance with a literature preparation.[17] With **9** in hand, a common synthon to prior work, we proceeded with alkylation and oxidative coupling using protocols mostly similar to the conditions previously worked out. Hydrolysis of the methyl esters to carboxylic acids provided complex **12**, which is a methoxy-derivatized variant of compound **4b**.

In this case, the methoxy groups were de-alkylated in a reaction that implicated excess equivalents of sodium ethyl thiolate to unmask the methyl-groups on either end of the molecule. Several attempts at phosphorylation of the diphenol, **13**, failed because of the realization that nucleophilic character on the carboxylic acid functional groups deterred from the competence of the phenol groups to perform the substitution. The problem was remedied by tying the carboxylic acid groups up into an anhydride, **14**, employing the commonly-used condensation activator, EDC, and a small quantity of 4-DMAP as catalyst. Attempts at phosphorylation of the resulting complex again proved futile; since the overall synthesis was unsatisfactory in terms of added number of protecting/deprotecting steps, and the overall low yields compared to those obtained in Scheme 1, the route was abandoned in pursuit of a more effective method.

The improved and completed method is described below in Scheme 4.

The strategy of this synthesis was to move the phosphorylation site to the alkyl-linker. The advantages of this target complex is that it keeps the indole-rings open for substitution studies to tune red-ox potentials. Commercially available 1,3-dibromo propan-2-ol was protected with the t-butyl-dimethylsilyl group [TBDMS] in order to generate an "alcohol" synthetic equivalent that could be carried through the harshly basic conditions of alkylation and nBuLi-promoted coupling. Protection was easily performed,[18] generating a precursor in 91% yield to enter the alkylation route that had been used in previous syntheses. Of note is the pleasing result that oxidative coupling proceeded in 65% yield, one of the highest yields reported. This result is consistent with the hypothesis that the limiting factor to the synthetic viability of coupling is the problem of compound

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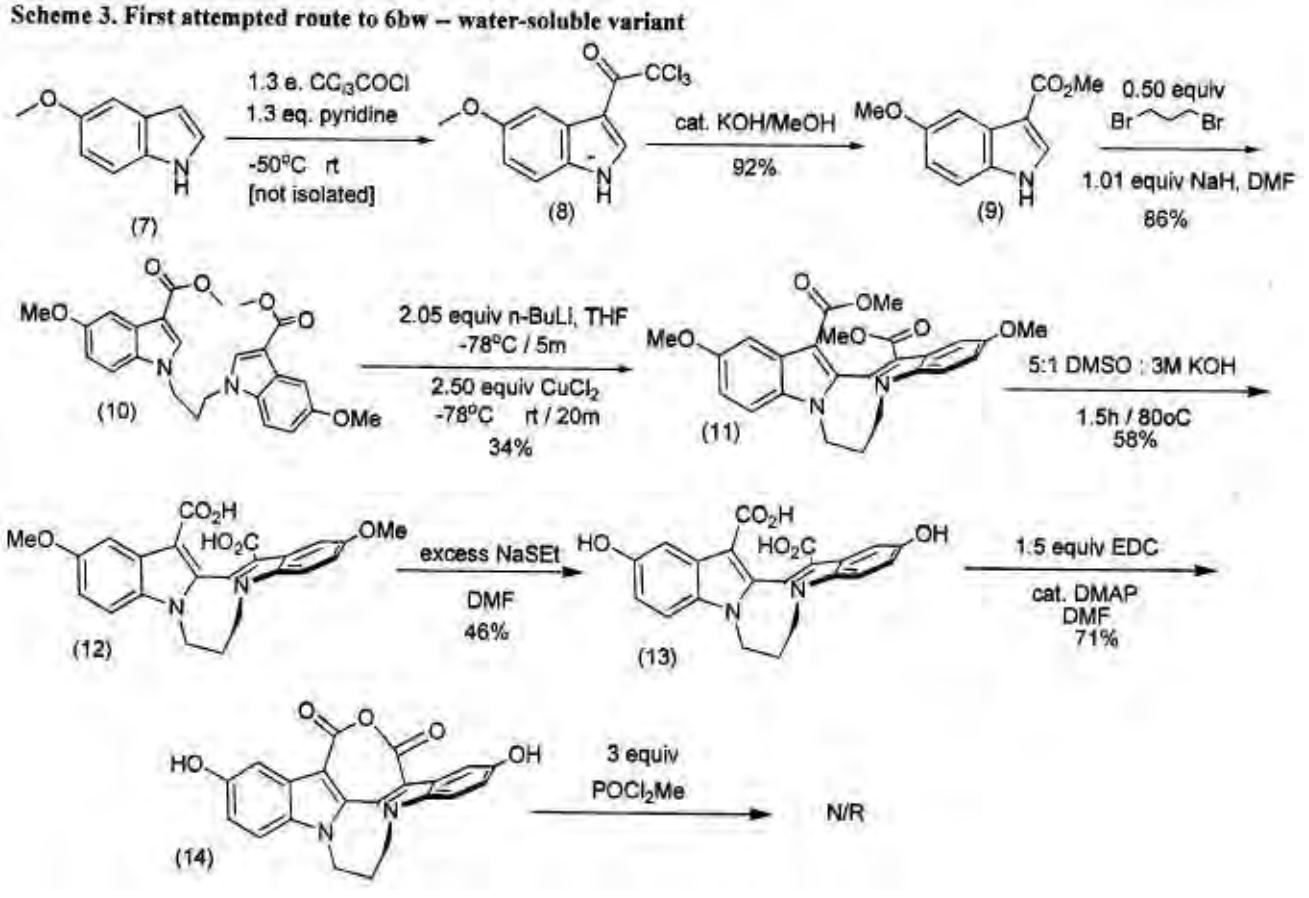
Scheme 3. First attempted route to 6bw -- water-soluble variant



Summer 07 Report

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solubility in THF. Ostensibly, the addition of the hydrophobic TBDMS group aids the solvation of the complex; the effect was also observed qualitatively by the rapid solvation of the compound during reaction set-up compared to prior compounds.

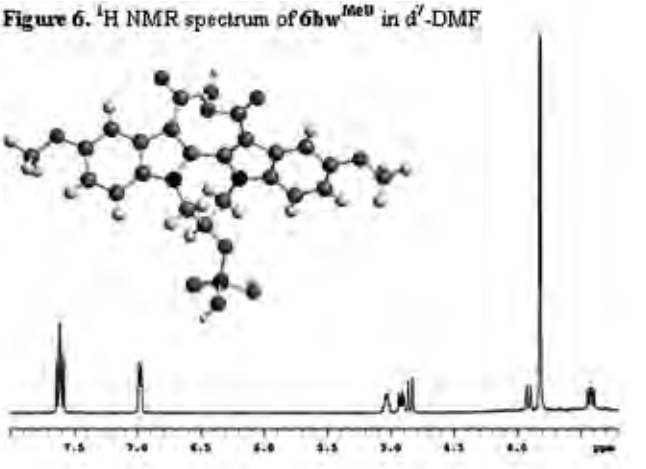
Subsequently, **4bw** – the de-protected equivalent – was prepared by reacting the coupled product with 3 equivalents of tetrabutylammonium fluoride. Ultimately phosphorylated products were accessible in remarkable yield with the development of relatively simple conditions: excess $POCl_3$ and pyridine in a flask stirring overnight at room-temperature, followed by hydrolysis of remaining P-Cl bonds via addition of acidic water to the reaction medium. Hydrolysis in 5:1 DMSO: 3M KOH furnished the final target, **6bw**, with the same dependability as had been found previously. Preparation of **6bw^{MeO}** required the same sequence of steps used to prepare **6bw**, except that **9** was used in place of **1** in the second step of Scheme 4. Otherwise, the method was identical and the yields were essentially the same. Overall, the second attempt at the water-soluble synthesis provided a method of obtaining the derivative of interest in fewer steps and with higher yields. Figure 6 presents a mechanical model and the complete ^{1}H NMR spectrum of the isolated **6bw^{MeO}** compound

Electrochemistry

Figure 7 displays differential pulsed voltagrams [DPVs] for complexes **6bw**, **6bw^{MeO}**, and their respective monomeric equivalents. Experiments were conduced in a 0.2M solution of K_3PO_4 at pH 7.0 using a Pt electrode.

The addition of a methoxy group activates the system toward lower absolute oxidation potentials – consistent with resonance arguments that typically assign methoxy-groups as π-donating moieties. Of additional interest is the observation that the biindolyl complex shows, in general, lower oxidation potentials by ~90mV with respect to its monomer. The effect indicates greater stability of a biindole-derived radical: the larger π-system of the dimer allows for greater SOMO delocalization, and is also a stabilizing feature. The lowest oxidation potential – at 811mV vs. Ag/AgCl – is reported for the methoxylated water-soluble variant, **6bw^{MeO}**, as a presumed triple anion in solution. The DPV

Figure 6. ^{1}H NMR spectrum of **6bw^{MeO}** in d^7-DMF



Scheme 4. Final and Completed Synthesis of 6bw

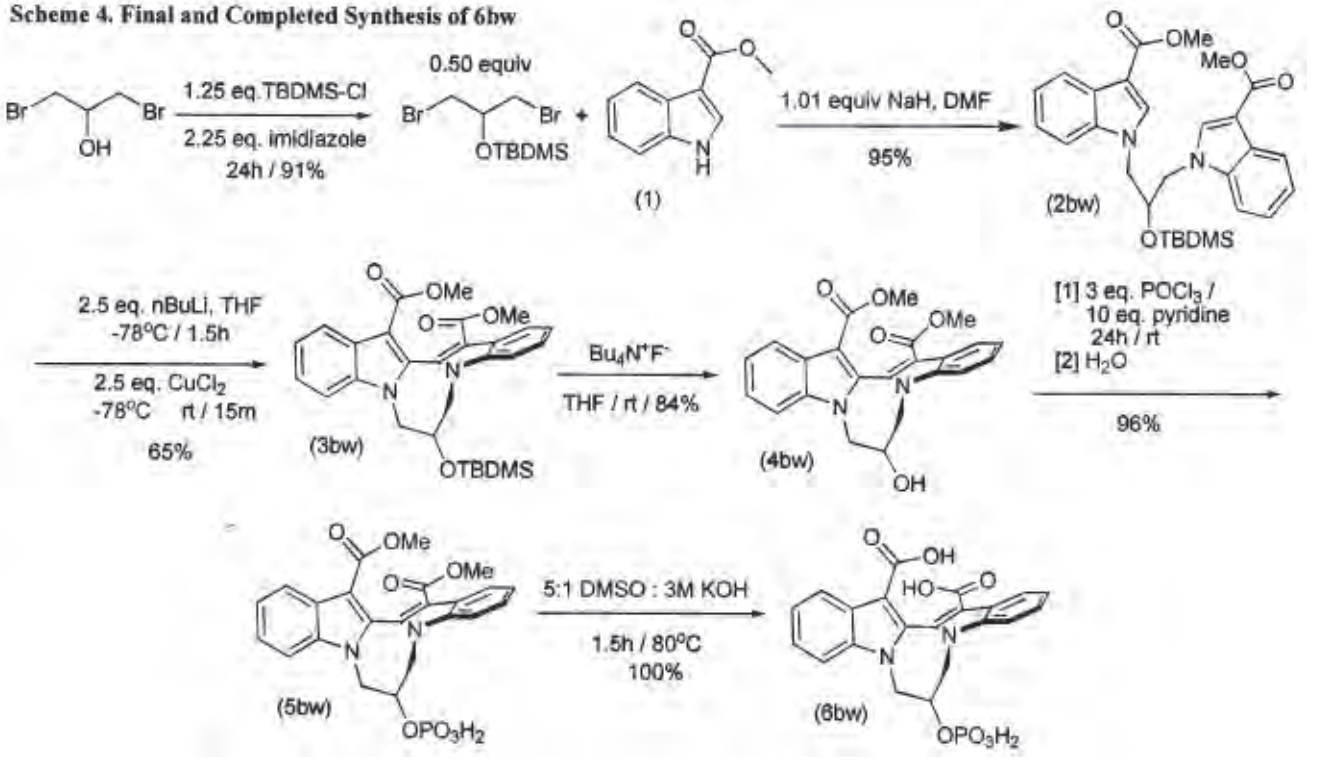
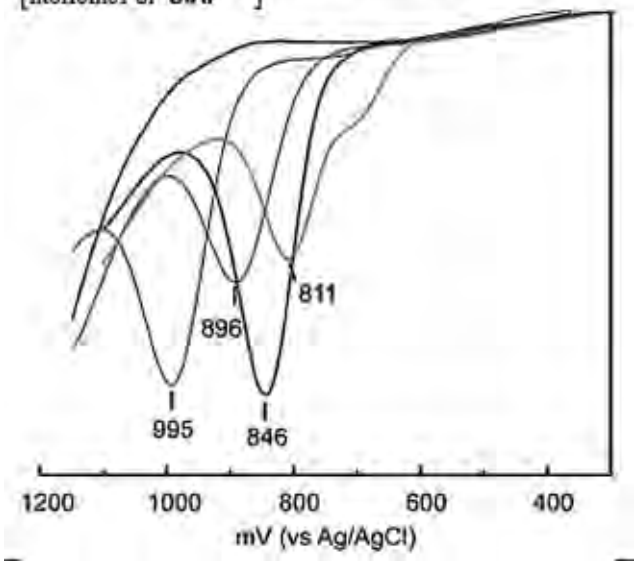


Figure 7. DPV in buffered neutral H_2O of various compounds; blue = $\mathbf{6bw}^{3-}$, red = $\mathbf{6bw}^{\mathbf{MeO}}{}^{3-}$, green = N-methyl-3-indolecarboxylate^{1-} [monomer of **6bw**], violet = N-methyl-5-methoxy3-indolecarboxylate^{1-} [monomer of $\mathbf{6bw}^{\mathbf{MeO}}$]



data provide important information about the target complexes' competence to be oxidized and especially noting the difference between the green and violet curves and between the blue and red curves confirms our hypothesis that aryl-susbstitution opens a path to red-ox potential tuning.

Whether or not these oxidation events are leading to O-O bond coupling is the next stage of this project, as future experimentation will be required to determine.

We are optimistic of these results for two reasons. It is nearly impossible for the compound to be undergoing side-reactions with the solvent, since the oxidation potential for H-dot removal from water to render an HO radical fragment is ~1.22V vs. Ag/AgCl, which is much greater than the range in which we witness oxidation of our complex. Figure 7 indicates that solvent break-down at the Pt-electrode [shown by the black curve] was not accessible at any of the potentials tested. The red curve reported for the methoxylated water-soluble biindolyl complex shows a small hint of a second oxidation event at ~695mV, as implied by the "blip" in the voltogram. That the oxidation occurs at a lower potential is somewhat consistent with a second oxidation on the opposite carboxylate, because the system might be relieving its radical character via a bond formation event. However, in order to demonstrate this result rigorously, more studies must be conducted on a bulk electrolysis scale to fully characterize the nature of the oxidized products. We are further interested in chemical oxidation of the specie by a sequential two-electron oxidant, to test if oxidizing agents – as demonstrated by the system of Meyer et al. – could induce O-O bond formation in our compound as well. These experiments are currently under way.

Conclusion

The goal of this report was to elucidate pathways of O—O homocoupling and to determine how molecular geometry and electronic properties affected catalytic efficacy of that process. Specifically, we probed the question of constructing a model system capable of coupling double oxidation of a bis-arylcarboxylate into an aroyl peroxide.

We arrived at a path to construct the model complex – a 2,2'-bisindolyl-N,N'-alkylated-3,3'-dicarboxylic acid. As determined by X-ray crystallography studies, the overall structure of the molecule was capable of pre-arranging the geometry of two oxygen atoms as close as 1.60 Å in the crystalline state. Solution-phase dynamic studies via VT NMR provided important supplemental evidence that the overall architecture of the scaffold was maintained at high temperatures, demonstrating the robustness of the alkyl-bridge and the indolyl-bond working in tandem to enforce a molecular geometry keeping the oxygen-atoms of interest in proximity to one another.

Initial electrochemical results of the compound provided some basic information about the unexpected role that geometry [through different bridge sizes] played on oxidation. We moved toward derivatizing the complex with phosphorylation in order to enable experiments in neutral water. In general, oxidation in water was easier due to ionization effects. Methoxy-derivatization at the 5-positions of the indoles provided evidence that the aryl moieties play a significant role in supporting the oxidation of the molecule, suggesting the possibility that the initial oxidation event might be from an orbital that is indole-centered rather than carboxy-centered. This result's implication affords us the vast resources of indole substitution chemistry to study how stereoelectronic factors can affect "remote" carboxylate oxidation. We have demonstrated that one of our molecules – **$\mathbf{6bw}^{\mathbf{MeO}}$ –** is oxidized in neutral water electrochemically at 811mV vs. Ag/AgCl and may additionally be subject to secondary oxidation events leading to O—O bond formation.

Acknowledgments

SDF would like to thank Dr. Matt Kanan for his mentorship, intellectual resources, and great patience in guiding this work, and for the electrochemical data. Further, he also acknowledges Professor Daniel Nocera and to the Northeastern Section of the American Chemical Society [via the Norris-Richards Summer Research Scholarship] for funding and supporting the project

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Photos from the March Meeting

Richards Medal Award

(Photos by Fritzsche Photography (www.photobeth.com)

Professor Bergman with Professor Fred Greene, MIT

Professor Robert Bergman and Mrs. Wendy Bergman

Professor Peter Vollhardt, UC Berkeley with Gary Weisman, Richards Award Committee, University of New Hampshire

Professor Dietmar Seyferth, MIT with Myron S. Simon, Nucleus Associate Editor and NESACS Archivist

Professor Bergman enjoying a humorous moment during Professor Vollhardt's introduction

Professor Marietta Schwartz awarding the Richards Medal to Professor Bergman

(L-R) Professor Gary Weisman, Professor Joe Billo, NESACS Chair-Elect, Professor Marietta Schwartz, NESACS Chair, UMass Boston

March Meeting Photos

Continued from page <None>

Gary Weisman speaking about the Richards Award at the Pfizer Lecture Hall at Harvard University

Professor Peter Vollhardt, UC Berkeley, Introducing Richards Award recipient, Professor Robert G. Bergman, UC Berkeley

NESACS Election

Election of Candidates

In the interest of providing maximum information and expression of opinion by the candidates for election in 2008, the Nominating Committee has prepared this section of the NUCLEUS for mailing concurrently with the ballots. All candidates were asked to submit biographical material and, with the exception of committee member nominees, position statements. To attain uniformity of format, the biographical data have been rearranged, and, where the text exceeded the allotted space, abbreviated. The statements have been reproduced without change. An official ballot, along with a ballot envelope and return envelope have been provided. The election and balloting are being carried out in conformance with Article VIII of the Constitution of the Northeastern Section. The order of candidates for each office on the ballot will be determined by lot. Comments regarding the election may be addressed to the Nominating Committee Chair, Dr. Patricia Mabrouk (address on p.3).

The ballot must be received by May 31, 2008. ◇

NESACS Election

Election of Candidates 2008

Chair-Elect

John McKew

Education: (1992-1993) Post-Doctoral Research, Firmenich, Geneva; Mentor: Christian Chapuis; (1991-1992) Post Doctoral Research, University of Geneva; Mentor:Wolfgang Oppolzer; (1986-1991) Ph.D. in Organic Chemistry, University of California, Davis, Mentor: Mark Kurth;

(1982-1986) B.S. in Chemistry and Biochemistry, State University of New York, Stony Brook.

Professional Experience: (1993-1998) Genetics Institute, Small Molecule Drug Discovery; (1998-2008) Wyeth Research, currently Associate Director, Exploratory Medicinal Chemistry.

Statement: I have been an active member of the ACS since 1986, but have never held an office within the NESACS. The NESACS is a well-organized group with a long and distinguished history. To maintain the group's positive momentum, I wish to bring new faces and energy to the group's leadership and to focus on increasing the participation of the local chemistry community in the regular meetings of NESACS. Because the Northeastern Section is rich in both academic and industrial employment opportunities, the pool of prospective attendees is deep. What does the NESACS offer to new attendees? In my opinion, the NESACS offers excellent scientific programs and networking opportunities. What would new attendees offer to the NESACS? I envision that more participation will lead to a more significant impact of the NESACS within the community. With more volunteers, we can do more! As chair-elect, I would apply strategies to make meetings more accessible: for example, I would vary meeting locations and times, increase the pool of talented academic and industrial speakers, and offer different levels of presentations, enabling increased participation by different audiences within the community. Lastly, I support holding additional events similar to the recently launched ACS/RSC/IUPAC sponsored symposium series, for which I am on the organizing committee. These symposia are held in Cambridge, and focus on synthetic and medicinal chemistry. Last year's NESACS/RSC/IUPAC event attracted over 200 people and convened members from these organizations and the local chemistry community for a stimulating day of science. I believe that symposia covering new topics would be of interest to members of the NESACS.

In summary, if elected I will concentrate my efforts on increasing attendance and participation at regular meetings, offering more opportunities to share science, and forging stronger bonds with other local chemistry related organizations. Thank you in advance for your consideration and support.

Norton P. Peet

Education and Experience: B.A. (1966) Ph.D., University of Nebraska (1970); Postdoctoral Research Associate, Massachusetts Institute of Technology (1970-1971); Postdoctoral Associate, University of South Carolina (1971-1972); Senior Research Chemist/ Research Specialist (1972-1979) Dow Chemical; Research Leader/Group Leader (1979-1984) Merrell Dow Research Institute; Senior Research Scientist/Director (1991-1996) Marion Merrell Dow; Head Medicinal Chemistry/Distinguished Scientist (1996-1998) Hoechst Marion Roussell and (1998-2000) Aventis; Vice President of Discovery Alliances (2000-2002) ArQule; CEO, President and Founder (2002-2005) Aurigene Discovery Technologies; Director of Chemistry (2005-present) Microbiotix; International R&D Consultant (2005-present).

NESACS Activities: Member of the ACS since 1967; Chaired and co-organized (with Raj Rajur) the following Symposia for the Medicinal Chemistry Section of NESACS: *Natural Product Scaffolds as Starting Points for Drug Discovery* (May 27, 2004) 852nd Meeting; *New Uses for Old Drugs* (September 9, 2004) 853rd Meeting; *Kinase Targets* (December 9th, 2004) 856th Meeting; *New Targets for Type II Diabetes* (May 19th, 2005) 861st Meeting; *New Targets for Type II Diabetes (Part II)* (December 8th, 2005) 865th Meeting; *New Trends in Oncology* (May 18th, 2006) 868th Meeting; *New Trends in Oncology (Part II)* (September 21, 2006) 871st Meeting; *Lead Optimization Strategies* (May 17th, 2007) 879th Meeting; *Signal Transduction Targets and Drug Discovery* (December 12th, 2007) 883rd Meeting. In other sections, the candidate has been active with Project Seed; organized an international symposium at a National ACS Meeting on Glycosidase Inhibitors; was an invited speaker at the Hydrazine Centennial Symposium at a National ACS Meeting; and has presented numerous scientific papers at National and Regional ACS Meetings.

Statement: I have enjoyed being an integral part of the Medicinal Chemistry Section of NESACS, working with Raj Rajur to organize and chair nine symposia in the last four years on topics of high current interest to the medicinal chemists in our section. During this period we have significantly grown the audience for these symposia and the meetings have become very well attended. As Chair of our Northeastern Section I will continue to be very active with the Medicinal Chemistry Section Meetings and will continue to orchestrate meetings with international speakers and pertinent topics for our constituents from the biotechnology and pharmaceutical sectors and the surrounding academic community.

I will also encourage an expanded audience to attend our monthly NESACS meetings by providing programming of interest to our broader audience of members. One specific mechanism for reaching out to our members will be to focus on societal topics that are currently in need of our attention. A specific example is the recent finding that our prescription drugs are now being detected in our environment, in the animal kingdom and in our drinking water. At least 63 drugs have been found in city water supplies.

TREASURER

James U. Piper

Education: B.S. MIT; M.S., Ph.D., Emory University.

Professional Experience: Research appointments at Yale U. 1963-6, MIT 1966-7 and 72-3, Worcester Foundation for Experimental Biology 1979-80. Teaching appointments at New Haven College 1963-6, Simmons College 1966-2002. Currently Emeritus Prof.

NESACS Service: ACS Member since 1960. 1990 Hill Award. NESACS Treasurer Sept. 1977-present.

Statement: The Treasurer chairs the Budget Committee, is responsible for all Section funds except those of the Trust Accounts, and prepares reports for the Board of Directors, National ACS, and state and federal agencies. Annual financial statements are prepared by a CPA to meet the requirements of the Massachusetts Attorney General. The Section currently operates with a budget of $300,000, of which 30% comes from Trust Funds, 35% from local and national dues, and 35% from contributions and program revenues. About 20% of all expenditures are related to awards which recognize achievements in chemistry at all levels, from high school students to professional chemists, including programs that encourage young people to enter the profession. Administrative expenses constitute 15% of expenditures. The remaining 65% supports services to the membership such as the Nucleus; monthly meetings; symposia; educational activities for students, teachers, and professional chemists; professional relations services including employment services; and public relations activities such as National Chemistry Week. The quality of these programs is high, and the major budgetary problems involve setting priorities among them. I am pleased to work with the members of the Board of Directors, who volunteer many hours in the service of their profession.

AUDITOR

Anthony Rosner

(2006 Biographical Information and statement)

Experience: Anthony Rosner has been Director of Research and Education at FCER for the past 14 years, blending a large variety of tasks distilled from a multifaceted background in basic research in biochemistry, clinical chemistry laboratory direction at a teaching hospital of Harvard, grants administration, teaching, journalism, and minority research program development. After obtaining his Ph.D. in Medical Sciences at Harvard in 1972 and conducting postdoctoral research at the NIH in Bethesda and at the CNRS in Gif-sur-Yvette, France, in 1973 and 1974, he directed research and clinical chemistry laboratories at Boston's Beth Israel Hospital, then taught chemistry and served as Department Administrator in Chemistry at Brandeis University and managed reseach operations in neonatology at Children's Hospital in Boston until he joined FCER. He chaired one of six charter committees at the inception of the National Center for Complementary and Alternative Medicine in 1992 and has served on the editorial board of three peer-reviewed journals, authoring papers reviewing chiropractic research, critiquing many recent publications of questionable research design, and exploring the role of homocysteine in provoking spontaneous vertebral artery dissection. He is the recipient of the Humanitarian of the Year Award from the American Chiropractic Association in 2000, as well as an honorary degree from the National University of Health Sciences in 2002.

Statement: It has been almost two decades that I have been serving as Auditor for the Northeastern Section of the ACS and have maintained the standards of accounting that should be, but are unfortunately not always universally, followed in today's corporate environment. It has been a particular source of satisfaction to have witnessed the growth of the Society over the past 20 years.

It will be my pleasure to extend my record of providing accurate and uncompromising service for the coming term.

TRUSTEE

Michael E. Strem

Education: A.B., Brown Univ. (1958); M.S. (1961); Ph.D., Univ. of Pittsburgh (1964).

Professional Experience: Strem Chemicals, Inc., President (1964-present).

ACS Service: Member, Board Of Directors elected from Region I (1998-2000); Comm. On Committees (1993-97); Society Comm. On Budget and Finance (1994-2005); Division of

Small Businesses, Councilor (1986-96), Chairman (1982-83, 1985); Comm. on International Activities (1998-2006).

NESACS Service: Chairman-Elect (1988); Chairman (1989); Board of Publications: Chairman (1991,1994); Chairman, Nominating Committee (1990-92); Northeast Regional Meeting, Exhibits Chairman (1993), Trustee (1997-present).

Memberships, Honors: Member, Royal Soc. Of Chemistry, Gesellschaft Deutscher Chemiker, Societé Francaise de Chimie; Materials Research Soc., Henry A. Hill Award for Distinguished Service to the Northeastern Section (1995). SOCMA (Board of Govs. 2005-2007).

Statement: Many years of experience have taught me much about the finances of the Northeastern Section. I am aware of the fiscal attitudes prevalent within our membership and will act accordingly if you elect me as Trustee. I promise also to work actively with the officers and board members in fiscal matters to support them in reaching the goals they have set for the Section. I feel that being President of a corporation over the whole of my career has provided me with the skills to manage the Section's funds properly, and I look forward to your support.

COUNCILOR/ ALTERNATE COUNCILOR

Kathi Browne

Education: Master's Degree, Worcester Polytechnic Institute, 1981; Bachelor's Degree in Chemistry, University of New Hampshire, 1974.

Professional Experience: (1997–current) Department Chair, Science Department, Natick Public Schools, Natick, MA; (1982–current) Chemistry Teacher, Natick Public Schools, Natick, MA; (1975–1982) Chemistry Teacher, Minnechaug Regional School District, Wilbraham, MA; (1974-1975) Colegio Nueva Granada, Bogota, Colombia, SA.

Memberships: MAST - Massachusetts Association of Science Teachers; TEC (The Education Cooperative); Science Directors

NESACS Involvement: Attendance at local annual workshops. Advisor to the Chemistry (Science) Club at Natick High School

Statement: In my role as a high school teacher and science department chair I act, on behalf of the department, to oversee the science education of our students. This includes oversight of the curriculum, such as aligning the curriculum with the state frameworks; however, it also requires that I be an advocate for science education outside the classroom. As a teacher I have encouraged students to take advantage of those opportunities which could give them greater insight as to the possibilities around them such as entering science competitions, exploring internships, visiting scientific-based companies, and meeting with scientists. Formation of a science/chemistry club is another way in which I have tried to create additional opportunities for students to explore their interests in science. If elected Councilor or Alternate Councilor I will be in a position to provide additional support to the chemistry teachers within my department so that they may better serve their students. I would also be able to provide support to the chemistry teachers in local high schools through my association with the TEC (The Education Cooperative). As a member of TEC Science Director's group I am provided a local venue for reaching out to high school teachers and, thus, their students. In my role as high school department science chair I have also established a network of teachers at the elementary level to whom I provide support by working on the alignment of curriculum, providing workshop opportunities, and writing grants to obtain funds for elementary science education. I have already established a support system for the education of all students, at all grade levels, in the area of science. My association with the ACS as a Councilor would give me additional resources to continue to provide teachers at all levels, elementary through high school, with the resources and opportunitites needed to promote science education in a public school setting.

Thank you for considering me for this position.

Mary Burgess

Education: Simmons College, BS Chemistry.

NESACS Service: I have actively participated in the NESACS programs during my career as councilor while working in academia, industry and government. I have been a member of the Educational and Professional Relations Groups at National meetings .

NESACS Activities: I have been involved with the development of the Student Award Programs and the Henry Hill Award . As Hospitality Chair , I participated in the following programs — National and Local: NERM 1978 ,Boston, and NESACS National Meetings- 1990, 1998, 2002,and 2007 including serving as Chair of the Local Hospitality Committee at the 2007 National Meeting in Boston; ACS summer programs which included the POPS and Summerthing. Currently, I am Chair of the Hospitality Committee of the Northeastern Section.

National Service: Member of Professional Relations Group - Women's Committee, Local Sections Committee and Economic Professional Affairs Committee.

Honors / Awards: I received the 1997 Henry Hill Award for service to the NESACS., and recently, 2007, the award for 60 years long-term service to NESACS .

Statement. I have been active in all local and national programs during my career. I will continue to work with and encourage others to participate in the local section, especially new and younger members. I will be proud to represent my section as Councilor of the Northeastern Section and ask for your continued support to do this. I hope that you will vote for me as your Councilor.

Mukund S. Chorghade

Education: B.Sc. 1971; M. Sc. 1973 (1st Class Honors) University of Poona, India; Ph.D. (Organic Chemistry), 1982, Georgetown University

Professional Experience: Research Fellow, National Chemical Laboratory (1973-74); Instructor, Georgetown University (1981-82); Postdoctoral Research Assoc., University of Virginia (1982-84); Postdoctoral Research Fellow, Harvard University (1984-85); Senior Research Chemist (1985-89); Project Leader (1989-90), Dow Chemical Co.; Research Scientist/Assistant Director, College de France, Paris and Universite Louis Pasteur (1990-91); Project Manager, Abbott Laboratories, Pharmaceutical Research (1991-95); Senior Director, Chemical Sciences Research & Development, CytoMed, Inc. (1997-98); President, CP Consulting, Chorghade Enterprises (1995 to present); Visiting Scholar, University of British Columbia, University of Chicago, Northwestern University, Caltech, Cambridge University; Vice President, Pharmaceutical Development Sciences, Geltex Pharmaceuticals / Genzyme , (2000 to 2003); President and Chief Scientific Officer, Pharmaceutical Sciences Division, D & O Pharmachem (2003-present), CSO & CTO, THINQ Pharma (2006-), Founder and CTO , Ascent Therapeutics (2006-), Director, MS Program in Drug Discovery and Development, Mass. College Of Pharmacy (2006)

ACS Service: Member since 1982. Chair, Brazosport Section (1990); Organic Division, member; Chairman, Symposium on Industrial Chem., Great Lakes Meeting, May, 1997; Visiting Speakers Program (1999 to present); Department of Career Services Consultant (2000 to present); Member, International Activities Committee (2003-present)

NESACS Service: Board of Directors (1997-), Public Services Committee, Chair; Professional Services Committee, member and chair (2005-); Public Affairs Committee; Public Relations Committee, Interim Editor, The Nucleus (2004), NESACS Chair-elect (2006), Chair (2007-2008)

Memberships, Honors: Maharashtra Academy of Sciences (Elected Fellow); Andhra Pradesh Academy of Sciences (Elected Fellow) IUPAC; Royal Society of Chemistry (Elected Fellow); New York Academy of Sciences; American Institute of Chemists (Elected Fellow); AAAS; Sigma Xi; Indian Society of Bio-Organic Chemists; IUPAC Commission on Biotechnology, Medicinal Chemistry, New Technologies and Special Topics, Titular member, Division of Chemistry and Human Health; 20th IUPAC Conference on the Chemistry of Natural Products, Chicago, 1996; Chair, Scientific Programs Comm., on Advisory Board for *Organic Process Research and Development, Chimica Oggi;* Member, Committees on Advanced Professional Thinking, International Activities and Technology, American Institute of Chemists. Awarded "Diamond Jubilee Fellowship", Univ. Dept. of Chemical Technology, Mumbai, India- Awarded "B.D. Tilak Distinguished Visiting Fellowship", University of Bombay, India. Awarded "Bharat Gourav" Award, Government of India. "Alkyl Amines Padma Bhushan Prof. B.D. Tilak Chemcon 2002 Distinguished Speaker Award". Listed in American Men and Women of Science, Who's Who in Science and Engineering Invited speaker at numerous international conferences

Statement: It is a singular honor and privilege to have been nominated to the position of Councilor / Alternate Councilor for the Northeastern Section.

It will be my endeavor to effectively represent the Northeastern section effectively in the National Council. The issues confronting the Chemical Enterprise in the USA and the ACS are complex and demand creative solutions. I will spare no effort in ensuring that the voice of our electorate is heard and that the council determines effective policies for all our members. My extensive experience in NESACS, most recently as Chair and National ACS governance has given me the necessary background to effectively represent the section

Michael P. Filosa

Education: B. Sc., Massachusetts Institute of Technology (1974), Ph.D., Harvard University, (1980).

Experience: Polaroid Corporation (1979-2005); Scientist, Group Leader, Senior Manager of Chemistry. (2005-present); ZINK Imaging, Inc.; Senior Manager of Chemistry.

NESACS Service: ACS Member since 1976. Alternate Councilor (1997-2000; 2005-2008); Editor of the Nucleus (2005-present). Local Organizing Committee for the 2007 Boston ACS National Meeting.

Statement: As the Editor of the Nucleus for the last three years, I have made a major contribution to the local section. Each year involves coordinating the production of ten issues, attendance at Board of Publications meetings as well as monthly Board Meetings. As a consequence of this duty, I am knowledgeable about the operations and activities of the NESACS. I am also well acquainted with the leaders and many members of our section. I believe I can serve the members of the NESACS well based on my experience and proven desire to contribute to the success of NESACS. I would very much like to continue as an alternate councilor or councilor so that I may represent the NESACS at National council meetings and promote the goals and objectives of our section at the national level. Thank you for considering my candidacy.

Patrick Gordon

Education: B.Sc. University of Guyana (1977); M.Sc, University of New South Wales, Australia (1982); Ph.D., University of Manitoba, Canada (1987).

Professional Experience: Post-Doctoral Associate, Kansas State University, (1987-1988); Organix Inc., Woburn, MA (1988-1991); Senior Scientist, Polaroid Corporation (1991-2001); ArQule Inc. (2001-2002); Polymer Laboratories, (2003-2004); Simmons College (2005 to Present).

ACS Service: Alternate Councilor (1994-1996, 1997-1999, 2000-2001, 2003-2006)

NESACS Service: NERM Chair of the Symposium on Cannabinoids, (1989); Centennial Committee Co-Chair (1998); Member, Board of Publications, (1999-2004); Secretary, Board of Publications, 2000; Chair, Board of Publications, 2002, 2004; Member, Board of Publications, 2003; Alternate Councilor ('94-'94 and '97-'99, '00-'01, '06-'08).

Statement: I have had the privilege of serving the Northeastern Section of the American Chemical Society since 1990 as a result of my involvement with the Medicinal Chemistry group. Subsequently, I served as an alternate councilor ('94-'94 and '97-'99, 06'08). In 1998, I was co-chair of the Centennial committee with Dorothy Phillips, when the section celebrated 100 years. In addition, I have served on the Board of Publications in several capacities and would like to think I helped guide the publication through a period of slow ad revenues. I am currently working as a career consultant within the division of Profession Relations as we endeavor to provide better career services such as resume, interviewing skills etc,

My goal is to continue to strive to develop ideas and to support the society as it serves to provide better benefits to its members. It would be a pleasure to continue to serve on the board of NESACS and I thank you for your continued support.

Morton Z. Hoffman

Birth Year: 1935.

Education: City University of New York–Hunter College, A.B., (1955); University of Michigan, M.S., (1957); University of Michigan, Ph.D., (1960).

Professional Experience: Boston University: Assistant Professor, (1961-1967); Associate Professor, (1967-1971); Professor, (1971-2005); Professor Emeritus, (2005-present).

ACS Service: Member and Consultant, SOCED Task Force on Undergraduate Programming at ACS National Meetings, (1991-2002); Member, College Chemistry Consultants Service, (1995-present), Advisory Board, (2002-04); Member, Editorial Advisory Board, ACS General Chemistry Project, (1999-2004); Associate Member and Member, Society Committee on Education, (2002-present); Member, Organizing Committee, Conference on Science and Education in the Middle East, (2002-present); Member, Planning Committee of the Invitational Conference on Exploring the Molecular Vision for Chemical Education, (2003). Division of Chemical Education: Member, Program Committee, (1992-2004), Chair, (1999-2001); Member, International Activities Committee, (1993-present); Chair, Regional Meetings Committee, (2000-present); Chair-Elect, (2004), Chair, (2005), Immediate Past Chair, (2006).

NESACS Service: Member, Board of Directors, (1993-present); Chair, Education Committee, (1993-96); Chair, College Subcommittee, Education Committee, (1997-present); Member, German Exchange Organizing Committee, (2001-present); Member, Centennial Committee, (1997-99); Alternate Councilor, (1994-97), (1999-2002); Councilor, (1997-98), (2003-present); Chair, National Meeting Committee, (2001-02); Chair-Elect, (2001), Chair, (2002), Immediate Past Chair, (2003). Member, Norris Award Committee (2007-2010).

Relevant Memberships: American Association for the Advancement of Science; New England Association of Chemistry Teachers. ACS Divisions: Inorganic Chemistry; Physical Chemistry; Chemical Education.

Honors: Phi Beta Kappa, (1955); Senior Postdoctoral Research Associate, U.S. National Academy of Sciences, (1969-70); Associate of the Danforth Foundation, (1970); Fellow of the American Association for the Advancement of Science, (1992); Metcalf Cup and Prize for Excellence in Teaching, Boston University, (1994); Henry A. Hill Award for Outstanding Service, NESACS, (1999); National Responsible Care® Catalyst Award for Teaching Excellence at Four-Year Colleges and Universities, American Chemistry Council, (2002); The John A. Timm Award for the Furtherance of the Study of Chemistry, New England Association of Chemistry Teachers, (2003); Arthur Sweeny, Jr., Memorial Lecturer, Lehman College of the City University of New York, (2003); U.S. National Representative to the Committee on Chemistry Education of the International Union of Pure and Applied Chemistry, U.S. National Academy of Sciences, (2004-present); Leavy Family Lecturer, St. Michael's College, Colchester, VT, (2005); James Flack Norris Award for Outstanding Achievement in the Teaching of Chemistry, NESACS, (2005); Professional Achievement Award, Alumni Association of Hunter College of the City University of New York, (2006); ACS National Award for Volunteer Service, (2007); Visiting Scientist Award, Western Connecticut Section, ACS, (2007).

Statement: At the end of this year, I will have served seven years on the Society Committee on Education (SOCED), first as Associate Member (2002) and then as Member (2003-08). My service on SOCED Subcommittee B (College/University/Continuing Education), has involved working with the ACS Education Division on the establishment of programs for undergraduates at national meetings, on the development of the ACS general chemistry textbook, and on strategic planning for the future of education in the Society. I was a member of the organizing committee for the invitational conference on Exploring the Molecular Vision, and am now on the follow-up task force for the development of ACS educational policy.

Inasmuch as my appointment to SOCED was based on my being a Councilor and my continuation on the Committee is conditional upon my remaining a Councilor, I ask for your vote to provide continuity to my service to SOCED, and as NESACS representative on the ACS Council, which is the policy-making body of the Society. I promise to continue to work forcefully on Council and SOCED to create stronger bonds between the Society and younger chemists, high school teachers, and underrepresented minorities. I promise to be an active voice for the Northeastern Section to represent the interests of our broad and diverse membership.

Doris I. Lewis

Education: Duke University, B.S. (1965), Tufts University, Ph.D. (1972).

Professional Experience: Suffolk University (1975-present); Chair, (1995-2004); Forensic Science Coordinator, (2002-2006); Newton College of the Sacred Heart (1970-75).

ACS Service: ACS Committee on Chemistry and Public Affairs, (2003-present); associate, (2001, 2002); Associate, ACS Council Committee on Local Section Activities, (1997); participant, ACS Legislative Summit on Capitol Hill, (2002, 2003, 2004, 2007, 2008); ACS Legislative Action Network (1991-present); ACS legislative action honor roll (2003, 2004).

NESACS Service: NESACS Chair, (2000); Councilor, (1994-2008); Alternate Councilor, (1991-93); Chair, Government Relations Committee, (2005-2008); chair, Phyllis A. Brauner Memorial Lecture Committee, (2002-2008); National Chemistry Week Committee, (2000-2008); chair, Legislative Affairs Committee, (2005-2008); Nominating Committee, (2001) chair, (2003); Board of Publications (1995-97), chair, (1997-8); task force to startup Section web page, (1996); National Meeting Committee (1990,1998); Student Affiliate Coordinator (1978-90); Continuing Education Committee, (1979-81); Suffolk University ACS Student Affiliate Chapter Advisor, (1977-present); chapter received national awards in 1997, 1999, 2001, 2002, 2003, 2004, 2005, 2006 and 2007.

Memberships: American Chemical Society (Divisions: ChemEd, Analytical, Environmental), AAAS, NEACT, NSTA/SCST, NEAFS (New England Association of Forensic Scientists), Sigma Xi.

Award: Henry A. Hill Award for outstanding service to the Northeastern Section of the American Chemical Society and to the Profession of Chemistry- 2003.

Statement: As I write this statement I have just returned from the annual ACS visit to congressional offices on Capitol Hill, and I am reflecting on this ACS activity as an example of our response to member needs. With ACS support, members have been able to influence executive policy (our wording supporting physical science research was in the State of the Union address), legislative action (America Competes legislation to improve science research and science education support was overwhelmingly passed), and now we're actively engaged in the charge to restore funding for the current and coming fiscal years. I'm grateful to ACS for the training and opportunity to participate, and proud of our Northeastern Section for our leadership role in ACS government outreach. In 2000, my year as NESACS chair, our Section received the first President's Award for Local Section Government Affairs. Since 2005 we have had an active NESACS Government Relations Committee, and our membership has continued to grow. You are invited to join us, or to check out the new options for action on the acs.org policy link- your e-mail to your congressional representative really can make a difference.

Another proud achievement of 2000 was our first major National Chemistry Week initiative, highlighted by the lecture by Bassam Shakhashiri that was to become the Phyllis A. Brauner Memorial Lecture. Since then our outstanding NCW chairs and an increasing number of enthusiastic volunteers have won numerous awards for their innovative and highly successful activities. As chair of the Phyllis A. Brauner Memorial Lecture Committee I have the delightful opportunity of working with National Chemistry Week volunteers to bring the joys of science to all ages through a public lecture-demonstration and hands-on activities. Again, all NESACS members cordially invited!

Support for education is a proud NESCAS tradition in which I have been honored to be involved. I initiated an ACS student affiliate chapter at Suffolk University and have had the pleasure of seeing those students learn the benefits of ACS membership and service as they gained ACS recognition. As an effort to bring more support to our high school teachers I was involved in starting the Connections to Chemistry program that under the stellar leadership of Ruth Tanner has become a pop-

ular annual event for high school chemistry teachers.

Service ought to be an important part of a councilor's role, and as a councilor I have tried in these and other ways to help to make our local section effective in delivering ACS member services and enabling member involvement. As councilor I have tried to represent all our members in the Northeastern Section. Industrial and academic chemists, those seeking employment, younger chemists or retired chemists, chemistry teachers, and the chemists of the future, our student affiliates and graduate students, all should be served by the Society and considered in its policies. I would appreciate your vote for Councilor, and I further ask if I am elected that you share with me your views and concerns so that I can serve you and our Section better.

Christine Jaworek-Lopes

Education: B.A, Tufts University (1992); Ph.D., Tufts University (2000)

Professional Experience: Assistant Professor, Emmanuel College (2000-present)

ACS Service: Member since 1992; Associate Member of Committee of Community Activities (2006-present)

NESACS Service: NCW Chair (2003- present); Member of the Phyllis A. Brauner Committee (2003-present); Councilor (2006-present)

Statement: I am excited to be nominated for the position of councilor/alternate councilor for the Northeastern Section. While my main focus would be to be a voice for members and to communicate their visions and ideas, an ongoing goal of mine is to increase visibility and interest in chemistry among primary and secondary school children. I have been able to begin this effort through my chair position of NCW. We reached out to school districts for classroom participation in poster and puzzle competitions. We received interest, feedback, and involvement from community educators. Also, during my seven years of involvement in NCW, there has been an increase in the number of volunteers from industry and academia at NCW events. Our section NCW events have been expanding each year by adding new venues and new programs. Since 2006, I have been an active member of the Committee of Community Activities. While on this committee, I have assisted in modifying the Chemluminary award process, participate in the development of activities for NCW 2009, and help design a mentoring program for Chemists Celebrate Earth Day coordinators. I would be honored to represent the section at local and national meetings by raising concerns sections members may have.

Raj (SB) Rajur

Education: B.S and M.S. in Organic Chemistry, Karnataka University, Dharwad, India; Ph.D. in Organic/Medicinal Chemistry, Karnataka University Dharwad, India (1988); Postdoctoral Fellow, University of Texas Southwestern Medical Center Dallas (1988-1990); Group Leader, Boston College, (Chestnut Hill, MA)(1990-1992); Instructor, Center for Engineering in Medicine, Massachusetts General Hospital, Harvard Medical School (1992-1996).

Professional Experience: Instructor, Shriners Burns Institute (Boston, MA), Instructor, Massachusetts General Hospital, Harvard Medical School, Adjunct Assistant Professor, Northeastern University (Boston, MA), Group Leader, Millipore Corporation (Bedford, MA), Project Leader, ArQule, Inc. (Woburn, MA). Reviewer, Journal of Pharmaceutical Sciences (ACS Journal), Recipient of research grants from University of Texas Southwestern Medical Center Dallas. Presently Founder, Chairman and CEO of CreaGen Biosciences, Inc. (Woburn, MA), (Founded 2002).

ACS/NESACS Service: Alternate Councilor, NESACS (2005-Present), Program Chair, Medicinal Chemistry Division, NESACS (2003-Present). NESACS Nominating Committee (2008), Planning Committee, NESACS, IUPAC and RSC-US, Sponsor of Advances in Chemical Sciences Symposium Series (2007 and 2008).

Membership/Honors: ACS Organic Chemistry Division, ACS Medicinal Chemistry Division and AAAS. Member of Indian Chemical Society. Listed in American Men and Women of Science and Who's Who in Science & Engineering. Advisory Board member in numerous Indian cultural and community organizations. Invited speaker at several international conferences.

Statement: In my tenure as Program Coordinator and then Program Chair for the NESACS Medicinal Chemistry Division, my mission has been to bring quality drug discovery science to our May, September and December symposia. Some of the recent topics on which we have focused are "Kinase Targets", "New Targets for Type-2 Diabetes", "New Trends in Oncology Part I and Part II", "Lead Optimization Strategies", and " Signal Transduction Targets and Drug Discovery" (December 2007). The purpose of bringing good pharmaceutical science to our very active local section audiences is a multipurpose one. Our territory now houses the biotech hub of the world, and has become a place where every multinational pharmaceutical company wants to partner, headquarter or establish a center of excellence. We, as a section, need to be exposed to a cross section of the science that is ongoing in the industry. Our meetings are venues for the exchange of ideas between industrial and academic participants. And, very importantly, our meetings are places where students from our many prestigious colleges and universities can network with professionals and learn from the symposia topics featuring cutting edge science.

As an Alternate Councilor, I have regularly attended the NESACS monthly meetings and contributed several new ideas and inputs. I have regularly represented the national ACS meetings and participated in governance meetings.

If elected as a Councilor, I will continue to support and encourage NESACS meetings that bring topnotch science to our audiences of academic

and industrial professionals and students. I ask for your vote and thank you for your support.

Donald O. Rickter

Education: University of California-Davis (Chem. AB and MS; credentials for teaching grades 7 - 12); Michigan State University Ph.D. physical organic chemistry

Experience: U.S. Navy 2 years; H.S. & college teaching 3 years; Polaroid Research 31 years (Scientist and Information Manager); Now an independent information consultant

NESACS Service: Section Chair-elect 1998; Chair 1999; Nominating Committee Chair 2000; Congressional Science Counselor (8th District, MA, 1974-92); Liaison between Polaroid and NESACS 1974-96; Program Committee 1981 and 1998; Board of Publications 1983-85; ACS and Polaroid exhibit at MA State House June 1992; Nominating Committee 1996; Helped start the NESACS website 1996; Co-Chair of Professional Relations Committee 1997; Work to plan MA State Capitol Days, June 1998 and June 2000; Calendar Coordinator forThe Nucleus 2000 - 2005; Currently a proofreader for The Nucleus.

Honors: NESACS Henry Hill Award in 2004

ACS Service: Member of ACS since 1952; ACS Presidential Task Force on K-12 Education in 2001; Current Member of Divisions of Chemical Information and Professional Relations; Alternate Councilor 1985 - 2005 (Attended about one national meeting per year as an acting Councilor); Councilor 2005 -2008

Statement: I am grateful for the opportunity to serve as Councilor; I am now an Associate of two committees: Ethics and Chemical Abstracts. I ask for your vote to be elected to a second term and serve on national committees for the benefit of our great section.

We have work to do to strengthen science education on all levels. We must endorse scientists in public service when their scientific decisions are undermined for political considerations. Younger chemists and women and minorities still need support in seeking full rights in their work places.

There are many opportunities for members to volunteer, to learn about our Society, to write articles for The Nucleus, and to enjoy meeting with interesting people (chemists).

Lawrence T. Scott

Education and Experience: A.B., Princeton University, (1966); Ph.D., Harvard University, (1970); Assistant Professor, University of California, Los Angeles, (1970); moved to University of Nevada, Reno, (1975); Full Professor, (1980);

Foundation Professor, (1985); Chairman, (1989-91); moved to Boston College, Professor, (1993-2006); Louise & Jim Vanderslice and Family Chair in Chemistry, (2006-present); Forchheimer Visiting Professor, The Hebrew University, Jerusalem, (spring 1987); Visiting Professor, Harvard University, (spring 1988); Visiting Professor, Georg-August Universität, Göttingen, Germany, (Fall 1999, May 2000, and May/June 2001);

Visiting Professor, Université du Littoral, Dunkerque, France, (June 2000);

ACS Service: ACS Sierra Nevada Section Secretary-Treasurer, (1976); Program Chairman, (1977); Chairman, (1978); Member, ACS Organic Division Nominating Committee, (1983); Member, ACS Award Selection Committee, (1987-90);

NESACS Service: NESACS Alternate Councilor (2003-present);

Other Relevant Activities / Memberships: National Institutes of Health Predoctoral Fellowship, (1967-70); NATO Senior Scientist Fellowship, (1981); Japan Society for the Promotion of Science Senior Scientist Fellowship, (1985 and 2003); Alexander von Humboldt Foundation Senior Scientist Award, (1999); Elected Fellow, American Association for the Advancement of Science, Washington, DC, (2003); Member, Editorial Advisory Board for the Journal of Organic Chemistry, (1995-1999); Member, Editorial Advisory Board for the journal Polycyclic Aromatic Compounds, (2004-present); Forchheimer Lecturer, Hebrew University of Jerusalem, (1987); Ernst Berliner Lecturer, Bryn Mawr College, (1995); Nozoe Memorial Lecturer, Hong Kong, (1998); Arthur W. Ingersoll Lecturer, Vanderbilt University, (2003); Stuart Rosenfeld Lecturer, Smith College, (2003); Jerome A. Berson Lecturer, Yale University, (2004). Co-Chairman, National Science Foundation Workshop on Organic Synthesis, (1974); Co-Chairman, Symposium on Organic Synthesis, Northwest Regional ACS Meeting, (1976); Co-Chairman, Symposium on Theoretically Interesting Molecules, International Chemical Congress of Pacific Basin Societies, (1984); Co-Chairman, Symposium on Molecules of Fundamental Importance, Chemical Congress of the North American Continent, (1988); Co-Chairman, Symposium on High Temperature Gas Phase Organic Chemistry, International Chemical Congress of Pacific Basin Societies, (1989); Program Chairman, Seventh IUPAC Symposium on Novel Aromatic Compounds, (1992); Member, International Advisory Board, IUPAC Symposium Series on Novel Aromatic Compounds, (1995-present); Co-organizer, Symposium on Novel Aromatic Compounds, National ACS Meeting, (1998); Co-Chairman, Symposium on pi-Electronic Systems with Novel Structure, International Chemical Congress of Pacific Basin Societies, (2000); Chairman for the Gordon Research Conference on Physical Organic Chemistry, (2003); Co-Chairman, NSF Workshops on Physical Organic Chemistry, (2003, 2004, and 2005). Co-organizer, Symposium on Fullerene Fragments and Carbon Nanotubes: Designed Synthesis, Unusual Reactions, and Coordination Chemistry, National ACS Meeting, (2008).

Research interests: Rational chemical syntheses of fullerenes and single chirality carbon nanotubes; synthesis and study of other organic compounds and materials with unusual structures

and properties: molecular bowls, baskets, belts, and related nonplanar geodesic polyarenes. Thermal reactions of aromatic compounds.

Statement: I will represent the members of the NESACS at the ACS council meetings to the best of my ability.

Liming Shao

Education: Ph.D. (Organic Chemistry), The University of Tokyo (1993).

Professional Experience: Postdoctoral fellowship, Chemistry Department, Harvard University, (1993-1996); Research Associate, Molecular and Cellular Biology Department, Harvard University (1996-98); Department Associate, Molecular and Cellular Biology Department, Harvard University (1998-present); Scientist, Sepracor Inc. (1998-2000); Senior Scientist, Sepracor Inc. (2000-01), Associate Director, Sepracor Inc. (2001-2005). Director (2005 – present)

Memberships and Honors: American Chemical Society, American Association of Pharmaceutical Scientist, American Pain society

ACS / NESACS Service: Program Chair, Medicinal Chemistry Group of the NEACS, (2005)

Statement: For the last three years I had the honor of serving as chair for the MCG of NESACS. I organized several well-attended symposia that brought together academic and industry scientists to discuss a variety of topics (Ion Channels, Outsourcing in Asia, Academic Drug Discovery). If re-elected, I would like to expand the connections between NESACS and other local biotech umbrella groups, such as the Massachusetts Biotechnology Council and do more outreach into the local high schools (with the YCC). One area I would like to focus on is increasing the participation of younger scientists (from industry and academia) in MCG events, and perhaps organize a symposia around the work of younger scientists. If re-elected I would continue to organize more high quality symposia and meetings that highlight the latest developments in the pharmaceutical industry, biotech and academia and provide a venue for local scientists exchange ideas, network and for career development. I would also like to organize some workshops or short-courses topics of interest to scientists in the region. If re-elected I will advocate for more support from NESACS for the MCG and work to increase the visibility of the MCG through positive publicity and coverage of the meetings. I will work closely with members from other committees, such as Continuing Education, to provide more opportunities for medicinal chemists to network at NESACS events.

DIRECTOR-AT-LARGE

Mukund S. Chorghade

See educational background, experience, honors, NESACS experience and honors under Councilor/Alternate Councilor.

Statement: It is a singular honor and privilege to have been nominated to the position of Director for the Northeastern Section.

My extensive experience in NESACS, most recently as Chair and National ACS governance has given me the necessary background to effectively be a Director of this section. I enjoy working among the immensely talented members of our section membership and will look forward to serving their needs as a Director

Ralph T. Scannell

Education: B.S., (1973), Boston State College (Major: Biology and Minor: Chemistry); M.S., (1978) University of Lowell (Chemistry); Ph.D., (1983), Brandeis University (Organic Chemistry).

Professional Experience: Laboratory Instructor, University of Lowell (1976-1977); Postdoctoral Research Associate, University of Virginia (1983-86); Senior Medicinal Chemist (1987-1990), A.H. Robins; Senior Research and Development Chemist (1990-1992), Ethyl Corporation; Principal Scientist (1992-1994), Associate Director of Medicinal Chemistry (1994-1996), Director of Medicinal Chemistry (1996-1998), Senior Director of Medicinal Chemistry (1998), CytoMed, Inc.; Senior Director of Chemistry (1998-2005), UCB Research, Inc.; Head of Chemistry (2007), Vice President of Chemistry (2007-present), Amulet Pharmaceuticals; Adjunct Associate Professor, MS Program in Drug Discovery and Development, Massachusetts College of Pharmacy and Health Sciences (2006-present)

ACS Service: Member since 1976; Organic and Medicinal Chemistry Division, member

NESACS Service: Vice Chair/ Programs 2006

Memberships and Honors: Science Advisory Board Member, University of Massachusetts in Boston; Boston Area Group for Informatics and Modeling, Inflammation Research Association; Listed in Who's Who in Science and Engineering

Myron "Myke" Simon

Education; Boston Latin School, Harvard A.B., M.A., Ph.D.

Career: 39 Years (1949-1988) in organic chemical research helping make instant color photography a reality at Polaroid Corporation. **Statement:** Having served in a variety of positions in the Northeastern Section, from Chairman to Archivist to Associate Editor of the NUCLEUS to whatever was needed, I ask you to vote for me to fill this position where I feel that my long service might still be of some use to the Section.

Nominating Committee

Jerry P. Jasinski

Education and Honors: B.A., M.S.T., University of New Hampshire (1964, 1968); M.N.S., Worcester Polytechnic Institute (1968); Ph.D., University of Wyoming (1974); 1st Recipient of the Keene State College Award for Faculty Distinction in Research and Scholarship (2001).

Professional Experience: Keene State College: Assistant Professor (1978-83), Associate Professor (1983-89), Professor (1989-), Chair, Department of Chemistry, (1999-). University of Virginia: Post Doctoral Research Associate (1974-75). Los Alamos Scientific Laboratory: AWU Pre-Doctoral Research Associate (1973-74), High School Chemistry/Physics Teacher (1964-70, 1975-78). American Institute of Chemists (AIC-Board of Directors 1999-01; 2007-09, President Elect 2009): (New England Institute of Chemists, NEIC, Treasurer, 1988-). Over 180 papers in chemical research journals.

Research and Interests: Physical-Inorganic Chemistry; Synthesis and X-ray crystallography of laser dye molecules and transition metal thiosemicarbazones. Co-developer of a web-based tutorial entitled "Symmetry and Space Groups". Introduction of Process Oriented Guided Inquiry Learning (POGIL) techniques into the chemistry curriculum.

ACS Service: Member since 1970. Member of INOR division. NESACS: Nominating Committee (2000-01, 2007-08), Alternate Councilor (2007-2009).

Memberships: American Chemical Society (ACS), American Crystallography Association (ACA), New England Institute of Chemists (NEIC), Council for Undergraduate Research (CUR), New England Association of Chemistry Teachers (NEACT).

Statement: Since joining the ACS in 1970, I have had only limited opportunity to serve while enjoying the many benefits offered. My experience at the undergraduate level in both teaching and research should serve as a catalyst and refreshing viewpoint as a member of the nominating committee if elected. As a prior member of the nominating committee (2000-01 & 2007-08) I would hope to continue to bring my expertise in this area to the section and provide added leadership to this important committee of the Northeastern Section of the American Chemical Society.

Dorothy J. Phillips

(2006 Information)

Education: Vanderbilt University, B.A., 1967; University of Cincinnati, Ph.D., 1974.

Professional Experience: (past 10 years): Waters Corporation, 1984 to date; Director, Clinical Marketing, 2004; Director, New Business Development, 2003-04, Director, Strategic Program Management, 2000-02; Brand Manager, 1997-99; R&D Laboratory Manager, 1986-96.

Service in ACS National Offices: Committee on Committees, 2001-06, Secretary 2003-04, Chair of Industrial Pipeline Sub-Committee 2005-06; Committee on Membership Affairs, 1997-00, Committee Associate, 1996; Committee on International Activities, Committee Associate, 1998.

Service in NESACS Offices: Member ACS since 1973. Northeastern Section: Councilor, 1995-2006; Chair, 1993; Chair-Elect and Program Chair, 1992; Project SEED, Committee Chair, 1994-95; Nominating Committee, Chair, 1994; Co-chair Centennial Celebration, 1998; Chair, Fundraising Committee, 2004-06.

Memberships: The American Society of Mass Spectrometry (ASMS); American Association of Pharmaceutical Scientists (AAPS); National Organization for the Professional Advancement of Black Chemists and Chemical Engineers (NOBCChE); American Association of Clinical Chemists (AACC); ACS Divisions: Agrochemicals; Analytical Chemistry; and Biological Chemistry.

Honors: Sigma Xi; Distinguished Alumni, University of Cincinnati, awarded by both McMickens College of Arts and Sciences and Department of Women Studies; Waters' Manager Award for Innovation, 1987 and 1988; Honored by TTT Mentor Program of Cambridge, MA as a Minority Role Model, 2004-05, "Minority Role Models in Science, Mathematics, Technology and Engineering - A Traveling Photo Exhibit".

Related Activities: Dow Chemical Company, 1974-84; Delegate with the People to People Ambassador Program to China in 1990 with a group of scientists for technology transfer; Member of AAPS Delegation to China in 2004

NESACS Candidates

Continued from page 31

to explore academic and industrial collaborations in the pharmaceutical sciences; Established Waters' sponsorship of the Distinguished Service Award in Analytical Chemistry given by the Division of Analytical Chemistry; Partners in Mathematics and Science Committee of Alpha Kappa Alpha Sorority Incorporated, coordinating the Northeastern Section's sponsorship of programs that focus on increasing the math and science interest of minority students in greater Boston; Mentor for the New England Board of Higher Education (NEBHE) Science Network for students who are traditionally underrepresented in Science, Technology, Engineering and Mathematics (STEM); papers presented at PittCon, International Symposium on Column Liquid Chromatography (HPLC Symposiums) and at the national meetings of ACS, AAPS and ASMS. Approximately 70 publications and presentations in the field of analytical chemistry with a focus

Amy E. Tapper

Education: B.S. Chemistry, Boston College; Ph.D. Chemistry, Boston University

Professional Experience: Aquatec, Inc., Colchester, VT (1994-95); Wyeth-Ayerst Pharmaceuticals, Rouses Point, NY (1995); Senior Scientist, Genzyme Drug Discovery and Development, Waltham, MA (2001–2004); Associate Director, Peptimmune (2004-2007); Principal Scientist, Momenta Pharmaceuticals (2007); Executive Director, FKB (2008-present)

ACS Service: Member (1995–present): International Activities Committee, Associate (2004-2007), Councilor (2003–06, 2007-2009); Boston National ACS Meeting Committee, 2002, 2007; Committee on Economic and Professional Affairs (2008-present)

Recipient of a 2002 ACS YCC Leadership Development Award

NESACS Service: Chair-elect (2004), Chair (2005), Immediate Past Chair (2006); Chair NESACS Golf Tournament (2005-2008); Younger Chemists Committee (NESACSYCC)-Founding member, Co-chair (1999), Chair (2000-02), Co-chair (2003); Chair Career Development Committee, Chair, Social Committee, Co-chair (1999-2003); Coordinator of (2001-2003) YCC Career Workshops. Northeast Student Chemistry Research Conference (NSCRC) Committee-Founding member, Co-chair and Speakers Officer (1999-2000); Chair (2001); Co-chair (2002). Member of the steering committee for the exchange initiative between NESACS and the GDCh (2000–2006); YCC position on the NESACS board (2000-03); Nominating Committee (2001), Director-at- Large (2002); Corporate Affiliates Committee (2003). YCC ChemLuminary award received in 2000, 2001, 2002, 2003 and 2004

Other Related Professional Experience/Service: Boston University Younger Chemists Committee-Founder and President (1999-2000); Chair, Career Development Committee (1999-2001); Co-chair, Social Committee (1999-2001); Member of the Graduate Student Organization of Boston University (1998-99); Student member of the Boston University Chemistry Graduate Affairs Committee

Norris Award Committee

Kathi Browne

See education, professional experience, memberships, NESACS involvement and statement under Councilor/Alternate Councilor.

Jerry P. Jasinski

See education, professional experience, memberships, research and interests and ACS service under Councilor/Alternate Councilor.

Statement: Since joining the ACS in 1970, I have had only limited opportunity to serve while enjoying the many benefits offered. My experience at the undergraduate level in both teaching and research should serve as a catalyst and refreshing viewpoint to the continued development of chemical education, one of this section's most important assets. I would hope to bring my expertise in this area to the section and be an advocate of programs that promote and bring excitement to science and chemistry to young people as well as recognize the achievements of both graduate and undergraduate students in the chemical sciences within the Northeastern Section of the American Chemical Society. I would be a positive spokesman for the continued development of educational programs and the Norris Award for students at both the graduate and undergraduate level both locally and nationally and encourage further development of the student-mentor relationship.

Raj (SB) Rajur

See education, professional experience, ACS/NESACS service, and member-ships/honors under councilor/alternate councilor.

Statement: The Norris Award Committee is a very prestigious honor bestowed by the Northeastern Section of ACS. The selection of an honoree each year is a difficult task because so many of the nominees are outstanding scientists. I have had the privilege of inviting and interacting with several top-notch scientists from many academic institutes and pharmaceutical and biotech companies during my tenure as a Program Chair for the Medicinal Chemistry Division and would consider it an honor to serve on this committee. I have been a member of the NESACS and Program Chair of Medicinal Chemistry Division for the past several years.

Ralph T. Scannell

See education, professional experience, ACS service, NESACS service, membership and honors under Director-at-Large. ◇

What exactly goes on at NESACS' monthly Board meetings?

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Summer 07 Report

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Q. Exactly, how many awards and scholarships does NESACS sponsor?

A) One b) Two c) Many

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Calendar

Check the NESACS Homepage for late additions: http://www.NESACS.org

Note also the Chemistry Department web pages for travel directions and updates.
These include:
http://chemserv.bc.edu/seminar.html
http://www.bu.edu/chemistry/events/
http://www.chem.brandeis.edu/colloquium.shtml
http://www-chem.harvard.edu/events/
http://web.mit.edu/chemistry/
www.chem.neu.edu/web/calendar/index.html
http://chem.tufts.edu/seminars.html [CHEM.]
http://ase.tufts.edu/chemical/seminar.htm [CHEM. ENGG.]
http://www.chem.umb.edu/
www.umassd.edu/cas/chemistry/seminars.cfm
www.uml.edu/Dept/Chemistry/speakers.html
http://www.unh.edu/chemistry/seminars.html

May 1

Prof. George Shields (Hamilton College)
"Computational Design of a Small Peptide that Inhibits Breast Cancer"
Boston College, Merkert 130
4:00 PM

Donald Sundberg (Univ. New Hampshire)
"Synthetic Control and Analytical Evidence of the Physical Structure of Composite Polymer Nanoparticles"
Univ. New Hampshire, Iddles L103
11:10 AM

May 5

Elizabeth Blackburn (Univ. California, San Francisco)
Frank H. Westheimer Prize and Prize Lecture
"TBA"
Harvard Univ., Pfizer Lecture Hall
4:15 PM

Prof. Peter Walter (Univ. California, San Francisco)
Ty Shen Lectures at MIT
"Intracellular Signaling In the Unfolded Protein Response: A walk along the serendipitous path of discovery of mechanism and physiology, Part 1".
MIT, 32-155
4:00PM

May 6

Prof. Scott Silverman (Univ. Illinois)
"DNA as a Catalyst for Bioorganic Chemistry"
Boston College, Merkert 130
4:00 PM

Prof. Peter Walter (Univ. California, San Francisco)
Ty Shen Lectures at MIT
"Intracellular Signaling In the Unfolded Protein Response: A walk along the serendipitous path of discovery of mechanism and physiology, Part 2".
MIT, 32-155
4:00PM

May 7

Brian Hoffman (Northwestern Univ.)
TBA
MIT, 6-120
4:00 PM

May 8

Prof. John Brauman (Stanford Univ.)
"Reactivity and Solvation in Ionic Reactions"
Boston College, Merkert 130
4:00 PM

John R. Abelson (University of Illinois at Urbana-Champaign)
TBA
Harvard Univ., Pfizer Lecture Hall
4:00 PM

May 13

Prof. John L. Wood (Colorado State University)
Title: TBD
Boston College, Merkert 130
4:00 PM

May 19

Karl Wieghardt (MPI Mulheim)
TBA
Harvard Univ., Pfizer Lecture Hall
4:15 PM

May 20

Dr. Xiaowei Zhuang (Harvard Univ.)
"Single-Molecule and Super-Resolution Imaging of Biomolecules and Cells"
New England Section: Society for Applied Spectroscopy Meeting
Hampton Inn – Natick, MA.
RSVP for Dinner at 6:30PM to Mark Druy (druy(at)psicorp.com)
7:30PM Presentation

May 22

Prof. Scott E. Denmark, FRSC (University of Illinois, Urbana-Champaign)
"Applications of Parallel Synthesis in Hit-to-Lead"
MIT, 6-120
4:00 PM

Notices for The Nucleus Calendar of Seminars should be sent to:

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