



THE NUCLEUS

April 2009

Vol. LXXXVII, No. 8

Monthly Meeting

*Esselen Award Meeting at Harvard
Awarded to Dr. Chad R. Mirkin,
Northwestern University*

13th Weinberg Memorial Lecture

*Dr. Lee J. Helman speaks at the
Dana-Farber Cancer Institute*

Science Club for Girls

By Mindy Levine

ACS and NESACS Medicinal Chemistry Groups

A History by John L. Neumeyer



The Division of Medicinal Chemistry (1909-2009) and The Medicinal Chemistry Group, NESACS (1964-2009)

Two significant anniversaries in 2009 deserve attention, the centennial anniversary of the founding of the Division of Medicinal Chemistry of the American Chemical Society (ACS) and the 45th anniversary of the Medicinal Chemistry Group of the Northeastern Section of the ACS.

The Division of Medicinal Chemistry

At a meeting of the **Pharmaceutical Science Section** of the ACS held in Detroit in October of 1909, a group of 35 chemists petitioned the ACS council to change the section's status and name to **The Division of Pharmaceutical Chemistry**. The new division was chaired by Alvisio Burdett Stevens of the University of Michigan and Benjamin L. Murray of Merck & Co., who served as Secretary. As the interests of its membership gradually changed from drug analysis and phar-

maceutical formulations, the division changed its name in 1920 to **The Division of Medicinal Products**. In 1928 there was a final change of name made to **The Division of Medicinal Chemistry** with the stated goals being "...stimulation of progress in medicinal chemistry research." The term Medicinal Chemistry replaced the less precise one, pharmaceutical chemistry, since medicinal chemists were primarily employed in the pharmaceutical industry and were recognized by the scientific community as practitioners of a unique type of chemistry, sometimes related to, but nevertheless separate and distinct from organic chemistry, biochemistry, and pharmaceutical chemistry (pharmacy).

The first National Medicinal Chemistry Symposium (sponsored by the Division) was held in 1948 at the University of Michigan with F.F. Bliche as the General Chair and Glenn

E. Ullget as the Program Chair. Symposia have subsequently been held regularly on alternate even-numbered years, always on a university campus. In 1968, the symposium assumed an international flavor, meeting at Laval University, Quebec, Canada, under joint sponsorship with the newly formed Medicinal Chemistry Division of the Chemical Society of Canada. A second joint symposium with this group was held at the University of Toronto in 1982, at which time Bengt L. Samuelsson from the Karolinska Institute in Sweden was awarded the Medicinal Chemistry Award. Later that year, Professor Samuelsson was awarded the Nobel Prize in Medicine. Since its earliest existence, the division recognized that an English language journal dedicated exclusively to medicinal chemistry research would be most desirable. It was not until 1959 that

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Cover: The 2009 Gustavus Esselen Prize Winner, Dr. Chad A. Mirkin of Northwestern University (Photo courtesy of Dr. Mirkin)

Deadlines: Summer 2009 Issue: June 16, 2009

September 2009 Issue: July 14, 2009

THE NUCLEUS

The Nucleus is published monthly, except June and August, by the Northeastern Section of the American Chemical Society, Inc. Forms close for advertising on the 1st of the month of the preceding issue. Text must be received by the editor six weeks before the date of issue.

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Science Club for Girls

By Mindy Levine

It is 2:30 p.m. on a Thursday afternoon at the Cambridgeport Elementary School in Cambridge, Mass., and the final bell has rung. Students exit from all doors, heading to after-school programs and activities. For a group of elementary school girls, their school day will not end until 3:45 pm, after they have met in their weekly Science Club for Girls.

This particular Thursday is the first day of Science Club for Girls at the Cambridgeport School, and the students have many questions. "Can we make ice cream like we did last time?" one fourth grader requested. A kindergarten student asked, "Why is Science Club for Girls only for girls? Why is there no Science Club for Boys?" Another student replied, "We love to learn so that girls can be smarter than boys."

In the fifth and sixth grade room, the girls were learning about the ocean. "How deep is the ocean?" asked one student. "Does oil really come out of

the ocean?" The group leader, a college student volunteer, patiently fielded their questions. "Oil comes out of rocks at the very bottom of the ocean," she replied. She reminded them that, "science is about asking questions you don't know the answer to."

History of the Organization

Science Club for Girls was started in 1994 by a group of parents who formed a Gender Issues in Education Committee at the King Open School in Cambridge to address discrepancies in the science education of girls and boys in elementary school. Fifteen years later, the program provides free after-school and weekend science clubs for 400 girls in grades K-12. Connie Chow, who has been the executive director of Science Club for Girls for the past two and half years, has overseen a substantial expansion of the program. During Dr. Chow's tenure, new clubs have been started in Lawrence, Boston and Framingham. The number

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of girls participating in the program has increased by approximately 30%.

Organizational Structure

The girls meet at various locations in the Boston area once per week after school. The club is divided by grade, with approximately 8 to 12 students per grade. Each club is led by a mentor-scientist, typically a graduate student or college student majoring in the sciences. There are junior assistants (JAs) as well, who are students in grades 8-12 who help the mentor-scientists with that day's curriculum. The junior assistants receive separate career guidance and counseling, in which female scientists come to discuss the

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Monthly Meeting

The 896th Meeting of the Northeastern Section of the American Chemical Society

Esselen Award Meeting

Thursday, April 16, 2009

Harvard University, Cambridge, MA

Harvard Faculty Club, 20 Quincy Street

5:30 pm Social Hour

6:30 pm Dinner

8:15 pm **Award Meeting**, Mallinckrodt Building, 12 Oxford Street
Pfizer Lecture Hall (MB23), Ground Floor

Dr. E. Joseph Billo, NESACS Chair, presiding

Welcome and History of the Esselen Award- Dr. John L. Neumeyer,
Chair, Esselen Award Committee

Introduction of the Award Recipient - Dr. Charles Lieber, Mark
Hyman Professor of Chemistry, Harvard University

Presentation of the Award - Gustavus J. Esselen, IV

*Nanostructures in Chemistry, Biology and Medicine: Realized
Promise and Future Prospects* - Dr. Chad A. Mirkin, Director of
the International Institute for Nanotechnology, George B. Rathman
Professor of Chemistry, Professor of Biomedical Engineering, Pro-
fessor of Biological and Chemical Engineering, Professor of Medi-
cine and Professor of Materials Science and Engineering,
Northwestern University, Evanston, Illinois

Dinner reservations should be made no later than noon, Friday, April 10.
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

Anyone who needs special services or transportation, please call Marilou Cash-
man a few days in advance so that suitable arrangements can be made.

Free Parking in the Broadway Street Garage (3rd level or higher), enter from
Cambridge Street via Felton Street. Directions to the Harvard Faculty Club can
be found at <http://www.hfc.harvard.edu/> . ◇

Biography

Dr. Chad A. Mirkin is the Director of the International Institute for Nanotechnology, the George B. Rathmann Professor of Chemistry, Professor of Medicine, and Professor of Materials Science and Engineering.

Professor Mirkin is a chemist and a world renowned nanoscience expert, who is known for his development of nanoparticle-based biodetection schemes, the invention of Dip-Pen Nanolithography, and contributions to supramolecular chemistry. He is the author of over 360 manuscripts and over 350 patents and applications, and the founder of two companies, Nanosphere and NanoInk, which are commercializing nanotechnology applications in the life science and semiconductor industries. At present, he is listed as one of the top 10 most cited chemists in the world, and is the top most cited nanomedicine researcher in the world.

Dr. Mirkin has been recognized for his accomplishments with over 50 national and international Awards. These include the Havinga Medal, Gustavus John Esselen Award, Biomedical Engineering Society's Distinguished Achievement Award, Department of Defense NSSEFF Award, Pittsburgh Analytical Chemistry Award, ACS Inorganic Nanoscience Award, iCON Innovator of the Year Award, a NIH Director's Pioneer Award, the Collegiate Inventors Award, National Inventors Hall of Fame (2002, 2004), an Honorary Doctorate Degree from Dickinson College, the Pennsylvania

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Abstract

*Nanostructures in Chemistry,
Biology, and Medicine:
Realized Promise and Future
Prospects*

Over the past decade, the world has witnessed an explosion of interest in the development of methods for synthesizing functional nanostructures. Nanostructures are both fundamentally

interesting and technologically useful because they can have properties that are markedly different from molecular analogues and their bulk counterparts. In biology and medicine, these fundamental property differences make certain nanostructures attractive as diagnostic labels and therapeutic agents. For example, over the past decade we have developed synthetic methods for preparing polyvalent oligonucleotide gold nanoparticle conjugates. These structures exhibit

unusual distance-dependent plasmonic properties, catalytic activity, cooperative binding, and a resistance to nuclease degradation— properties which make them extremely useful as probes in molecular diagnostic assays, as intracellular gene regulation agents, and as siRNA delivery vehicles. The fundamental origins of these properties will be addressed as well as the prospect for using such structures for developing several useful tools in chemistry, biology, and medicine. ◇

The 13th Annual Weinberg Memorial Lecture

Lee J. Helman, M.D.

Scientific Director for Clinical Research
Center for Cancer Research
National Cancer Institute

*“Targeting the IGF signal in sarcomas:
past, present and future”*

Tuesday, April 7th, 2009
4:00 pm – 5:00 pm

Dana 1620 Conference Room
Dana-Farber Cancer Institute

Biography



Lee J. Helman received his M.D. from the University of Maryland School of Medicine magna cum laude in 1980 and was elected to Alpha Omega Alpha. He completed his internship and residency in Internal Medicine at Barnes Hospital Washington University, where he also served as Chief Resident. He began his fellowship training at the National Cancer Institute in 1983, where he has remained.

Dr. Helman is the Scientific Director for Clinical Research and a Deputy Director in the Center for Cancer Research, National Cancer Institute.

He is a Professor of Pediatrics and Oncology at the Johns Hopkins University. He was elected to the American Society for Clinical Investigation and the American Association of Physicians and is a founding member and past president of the Connective Tissue Oncology Society. He serves on the Board of Directors of and is a Clinical Advisor to The Children's Inn at NIH and is a past member of the Board of Governors of the Clinical Center at NIH. He is a past member of the Board of Directors of the American Society of Clinical Oncology, currently serves on the Science Education Committee of the American Association of Cancer Research, and is on the Scientific Advisory Committee of the Chil-

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laboratory findings, we are planning clinical trials of IGFIR blockade in combination with other interventions, such as mTOR inhibition. ◇

Abstract

Targeting the IGF signal in sarcomas: Past, Present, and Future

My laboratory has been examining the role of growth factors in pediatric sarcomas for over 20 years. Advances in basic science, which have depended on the work of many laboratories, are leading us to the development of novel treatments for sarcomas.

We and others have demonstrated that insulin-like growth factor (IGF)-II is over-expressed in rhabdomyosarcomas (RMS), where it functions as an autocrine growth factor. Its anti-apoptotic activity is mediated by the activation of mTOR signaling. We have also shown that a loss of imprinting of the IGFII ligand is present in both RMS and Ewing's sarcomas (ES). We have found that blocking mTOR signaling restores apoptosis capacity even in the presence of IGF signaling. Similarly, we and others have found that mTOR blockade activates Akt through a loss of feedback inhibition of IGF signaling, and that this Akt activation can be abrogated by blocking the IGFI Receptor (IGFIR). This suggested to us the potential utility of combining mTOR plus IGFIR inhibition to inhibit this Akt

activation. In addition, ongoing studies suggest a role for the adaptor signaling molecule CRKL in RMS cell survival.

Given previous demonstrations of the activity of human antibodies (hAb) to IGFIR against ES in Phase I studies, we developed an international Phase II study in collaboration with the Sarcoma Alliance for Research through Collaboration (SARC) to examine the efficacy of one of these hAb (Roche) against sarcomas. Patients being enrolled in this study include those with treatment-refractory ES, RMS, osteosarcoma, synovial sarcoma, and a variety of other sarcoma types. We have observed clear responses to IGFIR hAb treatment in ES and RMS; however, responses are sporadic and may be transient. We are currently working to identify determinants of response to IGFIR blockade in the clinic. *In vitro* and *in vivo* models suggest that the antiproliferative activity of these antibodies is correlated with IGFIR levels, sensitivity is correlated directly with inhibition of Akt activation, and loss of response to IGFIR blockade is associated with re-activation of Akt. We have also found that, in some cell lines and human tumors, the overexpression of BCL-2 inhibits apoptosis independent of IGF signaling, which suggests the need for dual inhibition. Based on these clinical and

Attention all Northeastern Section Beer Brewers

Start Brewing!

The First Annual *NSYCC BrewHaHa* will take place on June 13th! As we mentioned in the January 2009 *Nucleus*, we're calling on the homebrewers and beer-aficionados among us to *show their stuff*. This will be an outdoor (weather permitting) social event where brewers and non-brewers will be welcome. This event is hosted by the NSYCC, BUT ALL AMATEUR SCIENTIST-BREWERS ARE WELCOME!

Details on the upcoming *NSYCC BrewHaHa* will be online as soon as they are available. Registration to attend will be 5 dollars, and registration to compete in the brewing competition will be 25 dollars, with monetary prizes awarded to up to four (4) top competitors. To register, please contact [leland.johnson\(at\)nsycc.org](mailto:leland.johnson(at)nsycc.org). Our policy, like the American Chemical Society's policy, is that if you choose to drink alcohol, please do so responsibly! ◇

Weinberg Biography

Continued from page 6

dren's Oncology Group. Dr. Helman is an associate editor for the journal *Cancer Research*, a Senior Editor for *Clinical Cancer Research*, and on the editorial board of the *Journal of Clinical Oncology*.

His lab currently has three major themes related to the biology and treatment of pediatric sarcomas: (1) the role of insulin-like growth factors on the biology of these tumors; (2) identification of the molecular mechanisms of metastases using animal models of spontaneously metastatic tumors; (3) translation of these findings into treatments to improve the outcome of patients with pediatric sarcomas. ◇

YCC Announcements

Registration is Ongoing for the Northeast Student Chemistry Two-Day Symposium

The Northeastern Section YCC (www.nsycc.org) encourages all chemistry undergraduate and graduate students and post-doctoral fellows to register online of our upcoming Career Fair and Research Conference. This year, the event will be held May 1-2, 2009, and will culminate in the election for our 2009-2010 YCC executive committee.

We are pleased to announce that:

- The Career Fair will be held on Friday, May 1st at the Brookline Holiday Inn
- Historically, eight to twelve companies have attended the Career Fair
- There will be social events on Friday after the Career Fair
- The Research Conference will be held on Saturday, May 2nd
- **Gregory C. Fu (MIT) will be the keynote speaker for the Chemistry Research Conference**
- Thanks to our sponsors, nearly \$2000 in awards were given for excellent presentations in 2008
- A limited number of **travel grants** will be awarded to students inside and outside the section
- Applicants must register for (and attend) both events to be eligible for (and receive) the travel grants

Please see our website for details and rules regarding registration for the two-day symposium and application for travel grants. For specific questions, please contact Lee Johnson ([leland.johnson\(at\)nsycc.org](mailto:leland.johnson(at)nsycc.org)).

Seeking Corporate Sponsors and Vendors for the Northeast Student Chemistry Two-Day Symposium

The Northeastern Section YCC (www.nsycc.org) is asking our hiring managers from all chemical industries to join us for our sixth annual Northeast Student Chemistry Career Fair on Friday, May 1, 2009. This year we are also asking regional sales representatives and managers from suppliers of laboratory equipment and consumables to join us for the Northeast Student Chemistry Research Conference on Saturday May 2, 2009. This two-day symposium will provide contact with career-seeking students from across the Northeastern Section, and will provide a great opportunity to collect resumé's and introduce laboratory products to this same audience. For an information sheet, please contact Lee Johnson ([leland.johnson\(at\)nsycc.org](mailto:leland.johnson(at)nsycc.org)) or Lynell Skewis ([lynell.skewis\(at\)nsycc.org](mailto:lynell.skewis(at)nsycc.org)). We look forward to helping you with your hiring and sales objectives for 2009!

The NESACS website

Updated frequently · Late-breaking news · position postings
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WWW.NESACS.ORG

Medicinal Chemistry

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the first edition of the *Journal of Medicinal and Pharmaceutical Chemistry*, edited by Arnold H. Becket (The Chelsea College of Science and Technology, London) and Alfred Burger (The University of Virginia) was published. This new journal appeared six times yearly. In 1962, *The Journal of Medicinal and Pharmaceutical Chemistry* became one of the official publications of the ACS with Alfred Burger as the sole editor. One year later, the name of the journal was changed to *The Journal of Medicinal Chemistry*. Phillip S. Portoghese (University of Minnesota) succeeded Professor Burger as Editor in 1972. Today, under the editorship of Professor Portoghese for the past 37 years, *The Journal of Medicinal Chemistry* is universally recognized as the premier publication in medicinal chemistry research in the world.

Consistent with the activities of other special interest divisions of the ACS and related scientific societies, the divisional membership favored the

publication of *Annual Reports in Medicinal Chemistry* which first appeared in 1966 due in large measure to the efforts of its first editor-in-chief, C. K. Cain. These reports, which appear annually and are written by investigators primarily from the pharmaceutical industry who are active in research and discoveries related to drug research, is recognized as the most significant publication of its kind. *Annual Reports in Medicinal Chemistry* has published 43 volumes as of 2008 and continues to be a unique resource for the medicinal chemistry community. It is sponsored by the Division and paid for by the Division membership from annual dues.

In 1966, The Division of Medicinal Chemistry, established two awards to recognize outstanding contributions to medicinal chemistry. The first award was presented to Professor Bernard Baker at the Biennial Medicinal Chemistry Symposium held at Indiana University. Other divisional awards subsequently established include the Bristol-Myers-Squibb Smissman Award, The Glaxo-Smith-Kline Alfred Burger Award, and the E. B. Hershberg

Award. In 2006 the division established the Division of Medicinal Chemistry Hall of Fame to honor all the above mentioned recipients, as well as members selected annually by the Executive Committee from nominations submitted by its membership. The roster of members of the Hall of Fame is listed below and includes Nobel Laureates, Bengt Samuelsson and George Hitchings, who won Nobel Prizes in Physiology and Medicine, respectively. Edward E. Smissman, for whom the Bristol-Myers-Squibb Smissman Award was named after his untimely death in 1974, was inducted into the Hall of Fame posthumously in 2008.

In 2006, the Division of Medicinal Chemistry held the distinction of being the second largest special interest division in the ACS with a membership of over 10,500, which includes members from many foreign countries.

The Medicinal Chemistry Group of the Northeastern Section of the ACS

In 1963 several chemists working in Arthur D. Little's (ADL) Chemical

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The NESACS Committee on Continuing Education is pleased to sponsor two Two-Day Short Courses, designed to improve the skills and marketability of practicing B.S., M.S., and Ph.D. chemists, at a registration fee about one-third of that charged at National ACS Meetings

Two Hands-On Short Courses for Advanced Microsoft Excel® Users

PLACE: Courtyard by Marriott, 342 Speen St., Natick, MA **INSTRUCTOR:** E. Joseph Billo

Dr. Billo is the author of *Excel® for Chemists, 2nd Ed.*, and *Excel® for Scientists and Engineers: Numerical Methods*, both published by J. Wiley and Sons. He has taught these courses to over 2,000 scientists at locations including ACS National Meetings, Amoco, Bayer, Chevron, Hercules, Kodak, Genzyme, National Cancer Institute, NIST, PITCON, Proctor & Gamble, Shell, Texaco, Unilever, and numerous others.

Advanced Excel® for Scientists and Engineers Ways to apply Excel to scientific problems.

DATES and TIME: **Thursday, April 23 & Friday, April 24, 2009; 8:30 a.m. – 4:00 p.m.**

- You'll learn how to:**
- produce professional-quality spreadsheets and charts.
 - create links between documents.
 - use Excel's lookup functions to obtain data from tables.
 - set up Excel to perform iterative calculations automatically.
 - use Excel's built-in functions to perform interpolation, multiple linear regression, and more.
 - use Excel's Solver to perform nonlinear least squares curve fitting.
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 - plus many shortcuts and tips to speed up your work.

Excel® Visual Basic Macros for Scientists An introduction to Visual Basic for Applications programming.

DATES and TIME: **Thursday, May 21 & Friday, May 22, 2009, 8:30 AM – 4:00 PM**

- You'll learn how to:**
- record simple macros to automate routine spreadsheet tasks.
 - write VBA procedures to carry out complex, repetitive calculations automatically.
 - create user-defined mathematical functions.
 - create macros to produce customized reports from Excel databases.
 - manipulate arrays and matrices.
 - create custom menu commands or toolbar buttons.

For further information contact Prof. Billo at: (508) 653-3074 or joseph.billo@verizon.net

Attendees should have some familiarity with Excel® in order to benefit from these courses. Participants should bring a laptop computer with Excel and CD-ROM drive. 110V outlets will be provided for power supplies.

PRE-REGISTRATION REQUIRED There will be a limited number of \$400 scholarships for unemployed ACS members.

Registration Fee*	Advanced Excel		Excel® Visual Basic		Both courses	
Received by	April 10	after April 10	May 11	after May 11	April 10	after April 10
ACS Members	\$500	\$595	\$500	\$595	\$750	\$845
Non - ACS Members	\$600	\$695	\$600	\$695	\$900	\$995
Graduate Students	\$250	\$345	\$250	\$345	\$375	\$470
Undergrad. Students	\$125	\$220	\$125	\$220	\$185	\$280

***Includes a copy of Excel* for Chemists, 2/e, value \$74.50)**

REGISTRATION FORM

Please check: € **Advanced Excel (April 23-24)** € **VBA Macros (May 21-22)** € **Both courses**

Name _____ I am: € ACS Member € Grad. Student € Undergrad.

Mailing Address _____ I use: € PC € Mac € Excel 2003 € Excel 2007

Tel: _____ e-mail: _____ Amount enclosed: \$ _____

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Please make check payable to NESACS (Sorry, no P.O.'s or credit cards.)

Science Club for Girls

Continued from page 4

details involved in a career in science. The JAs also attend field trips to see how science can be applied to their daily lives. Past trips included the Art Restoration Department at the Museum of Fine Arts and the New England Culinary Institute.

The curriculum for the students varies substantially by grade. Dr. Chow described the curriculum as “hands on,” and designed to show the students that science is fun, and that “there are everyday things they could use to explore scientific phenomenon.”

For example, in the fourth grade classroom at Cambridgeport, the group leader informed the students that the topic for the semester would be engineering. “What is engineering?” Ms. Karen Wilkinson, the Cambridge Program Manager of Science Club for Girls, asked. The replies came quickly. “Engineering is something you do and it helps the world.” “[Engineers] take stuff apart and then put it back together.” “Design cars.” “Help NASA.”

After the discussion of engineer-

ing, the girls moved into the hands-on experiment for the day - building a load tester out of straws, cupcake holders, and paper clips. At the conclusion of the experiment, the girls competed to see how many Skittles their load testers could hold before the testers collapsed. The girls’ prize? They could eat all of the Skittles held by their load tester. At 3:45 p.m., when parents and older siblings began arriving to take the girls home, the students pleaded for “just one more minute,” as they patiently added Skittles, one at a time, to their newly constructed load testers.

Goals and Philosophy

One of the key goals of the organization, said Dr. Chow, is to make sure “that science is accessible and available to as many as possible.”

“What we are trying to say is that science is for everyone,” Dr. Chow said. “Science is not only performed in highly sophisticated environments... There are people like you, there are women like you, who are doing science.”

Science Club for Girls focuses particularly on students from underrepresented groups. Over 75% of the par-

ticipants are girls of color. Many of the students are from lower income households. Furthermore, more than half of the JAs will be the first generation in their families to go to college. Dr. Chow spoke about one former JA from a single-parent home. “I think her mother’s ambition for her was to graduate from high school and work in a local retail store,” Dr. Chow said. “She went to Oxford.”

The mentor-scientists, said Dr. Chow, play an invaluable role. “One of the reasons that we call them ‘mentor scientists’ is [because of] the idea that these mentors are interested in the growth and development of these girls.” The girls “know that someone else has a stake in them. Knowing that they have a support system in the world... gives them confidence.”

Naomi Jiang, a mentor-scientist who is an undergraduate student at MIT studying biology, said she develops a relationship with the girls. “I think it is really good to have programs like these where you introduce younger children to a field that they may not have thought about going into,” Ms. Jiang said. The program allowed her to “expose [students to science] and have them start thinking about science at a younger age.” Ms. Jiang, who has been a mentor-scientist for two semesters, said she has been amazed at the students’ enthusiasm. “I am surprised by how much second graders know... you say one thing and they can relate it to so many examples.”

Plans for Future Growth

Science Club for Girls is funded entirely by donations from foundations, private companies and individuals. To date, Dr. Chow said, the organization has not needed to turn away interested participants. However, further expansion of the program would require increased funding. In the future, Dr. Chow said, she would like to collaborate with additional community centers, schools, and universities to bring the program to more girls.

“There are not enough of these programs around,” Dr. Chow stated. “We would love to grow a movement whereby college students, university

continued on page 11



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Mirkin Biography

Continued from page 5

State University Outstanding Science Alumni Award, the ACS Nobel Laureate Signature Award for Graduate Education in Chemistry, a Dickinson College Metzger-Conway Fellowship, the 2003 Raymond and Beverly Sackler Prize in the Physical Sciences, the Feynman Prize in Nanotechnology, the Leo Hendrick Baekeland Award, Crain's Chicago Business "40 under 40 Award," the Discover 2000 Award for Technological Innovation, I-Street Magazine's Top 5 List for Leading Academics in Technology, the Materials Research Society Young Investigator Award, the ACS Award in Pure Chemistry, the PLU Fresenius Award, the

Harvard University E. Bright Wilson Prize, the BF Goodrich Collegiate Inventors Award, the Camille Dreyfus Teacher-Scholar Award, the Alfred P. Sloan Foundation Award, the DuPont Young Professor Award, the NSF Young Investigator Award, the Naval Young Investigator Award, the Beckman Young Investigator Award, and the Camille and Henry Dreyfus Foundation New Faculty Award. He is a Member of the National Academy of Engineering and a Fellow of the American Association for the Advancement of Science.

Dr. Mirkin has served on the Editorial Advisory Boards of over twenty scholarly journals. At present he is a member of the Editorial Advisory Boards of *Accounts of Chemical Research*, *Advanced Materials*, *Angewandte Chemie*, *BioMacromolecules*, *Macromolecular Bioscience*, *SENSORS*, *Encyclopedia of Nanoscience and Nanotechnology*, *Chemistry-A European Journal*, *Chemistry & Biology Nanotechnology Law & Business*, *The Scientist*, *Journal of Materials Chemistry*, and *Journal of Cluster Sci-*

Science Club for Girls

Continued from page 10

professors and women who are working in companies all feel like they can take our program and start their own branch." In this way, she will be able to ensure that girls who are underserved continue to have opportunities like participating in Science Club for Girls.

Dr. Chow concluded with a broader view of the culture of science and its attitude toward women and other underrepresented groups. "Organizations like Science Club for Girls are doing our part to broaden the understanding of science and to get girls interested in science. At the end of the day, it is institutions that must actually change their culture to really make it welcoming for everyone."

For more information about Science Club for Girls, visit their website at www.scienceclubforgirls.org, where you can see videos of the girls, read more about the history of the program, and find ways to donate time and/or money to the organization. ◇

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ence, Plasmonics. He is the founding editor of the journal *Small*, one of the premier international nanotechnology journals, and he has coauthored two best-selling books on nanobiotechnology. Dr. Mirkin holds a B.S. degree from Dickinson College (1986, elected into Phi Beta Kappa) and a Ph.D. degree in chemistry from the Pennsylvania State University (1989). He was an NSF Postdoctoral Fellow at the Massachusetts Institute of Technology prior to becoming a chemistry professor at Northwestern University in 1991. ◇



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Medicinal Chemistry

Continued from page 8

Sciences Section discussed the possibility of starting a medicinal chemistry group within the Northeastern Section

of the ACS. At that time there were only two pharmaceutical companies in the area, Astra and the Kendall Company, but many prestigious research organizations, such as Boston University Medical School, Harvard Medical School, Children's Hospital, Massachusetts General Hospital, Tufts Medical School, The Worcester Foundation, and two colleges of pharmacy with medicinal chemistry departments (Massachusetts College of Pharmacy and Northeastern University). The first meeting of the Medicinal Chemistry Group of the Northeastern Section was held on November 17, 1964 at ADL in Cambridge, Massachusetts, and John L. Neumeyer, then at ADL, was elected the first and founding chairman. The late Gloria Lyle, then at the University of New Hampshire, served as the first secretary. Louis Harris, then a Senior Research Biologist in Pharmacology at Sterling Winthrop Research Institute, Rensselaer, NY, spoke at the first meeting on *Pain, Analgesia and Addiction – A Pharmacological and Medicinal Chemical Approach to the Problem*. It is most gratifying that the Medicinal Chemistry Group flourished over the years and continues to attract new members. In the 1990s many biotech and major pharmaceutical companies, as well as numerous start-up companies, have chosen to locate their research facilities in the Boston-Cambridge area. This influx of pharma research is no doubt due to the presence of four medical schools, excellent academic institutions with strong chemistry departments, and two colleges of pharmacy. The ongoing expansion of these biotech and pharmaceutical companies should bode well for the continued viability of the Medicinal Chemistry Group in the Northeastern Section for many years to come.

John L. Neumeyer
Distinguished Professor of Medicinal Chemistry and Chemistry, emeritus, Northeastern University, Director of Medicinal Chemistry Program, McLean Hospital, Harvard Medical School, Belmont, MA.
jneumeyer@mclean.harvard.edu ◇

American Chemical Society Division of Medicinal Chemistry Hall of Fame

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<http://www.unh.edu/chemistry/seminars.html>

April 1

Kyoung-Shin Choi, Purdue University
MIT, 6-120
4:00 pm

Dr. Christopher Doona, Biosciences and
Technology Team, U.S. Army NSRDEC
“Comparing the Quasi-chemical and other
models for controlling foodborne microbes
using novel technologies.”
UMass Dartmouth, Building Group II,
Room 115
4:00 pm

April 2

Thomas E. Mallouk, Pennsylvania State
University
“A Nanoscience Approach to Photocatalysis and
Solar Cells”
Harvard Univ. Pfizer Lecture Hall
4:00 pm

April 6

Andrew J. Phillips, University of Colorado
Brandeis University, Gerstenzang 122
3:45 pm

April 6-7

The Max Tishler Prize Lectures
Tohru Fukuyama, University of Tokyo
Harvard Univ., Pfizer Lecture Hall
4:00 pm both days

April 7

Prof. Jovica Badjic, Ohio State University
“Gated Molecular Baskets”
Boston College, Merkert 130
4:00 pm,

Prof. Jacqueline Barton, California Institute of
Technology
“DNA-Mediated Signaling of Damage and
Repair”
Tufts Univ., Pearson Chemistry Building,
Room P-106 at
4:30 pm

April 9

Stuart Rice, University of Chicago
Harvard Univ., Pfizer Lecture Hall
4:00 pm

Jovica Badjic, Ohio State
U. New Hampshire, Iddles, Room L103
11:10 am

David E. Cane, Brown University
MIT, 6-120
4:00 pm

Apr 13

Michael Green, Pennsylvania State
Brandeis University, Gerstenzang 122
3:45 pm

April 14

Prof. Tehshik Yoon, Univ. Wisconsin
“Oxidative Functionalization Reactions of
Oxaziridines”
Boston College, Merkert 130
4:00 pm

Prof. Samuel Kounaves, Tufts University
“The Saga of a Robotic Lab Assistant on Mars”
Tufts Univ., Pearson Chemistry Building,
Room P-106 at 4:30 pm

April 15

Dr. Jay D. Keasling, University of California,
Berkeley
“Engineering microbial metabolism for
production of anti-malarial drugs”
Boston College, Merkert 127 4:00 pm

April 15

Michael Green, Pennsylvania State University
Harvard Univ. Pfizer Lecture Hall
4:00 pm

April 16,

Dr. Jay D. Keasling, University of California,
Berkeley
“From Bugs to Biofuels”
Boston College, Merkert 127 4:00 pm

Lara Mahal, University of Texas at Austin
MIT, 6-120
4:00 pm

Richard Saykally, University of California,
Berkeley
“pH of the Liquid Water Surface: Selective
Adsorption of the Hydronium and Hydroxide”
Harvard Univ., Pfizer Lecture Hall
4:00 pm

April 17,

Dr. Jay D. Keasling, University of California,
Berkeley
“Synthetic Biology: a new discipline in
biological engineering”
Boston College, Merkert 127 4:00 pm

April 20

Michael Krische, University of Texas, Austin
Brandeis University, Gerstenzang 122
3:45 pm

April 23

Professor Scott Denmark, University of
Illinois, Urbana-Champaign
Novartis Lecturer
Boston College, Merkert 130 4:00 pm

Harry Atwater, California Institute of
Technology
“Plasmonic materials and structures for
computing and solar energy conversion”
Harvard Univ., Pfizer Lecture Hall 4:00 pm

Prof. Mark D. Marshall, Amherst College
U. New Hampshire, Iddles, Room L103
11:10 am

M. Christina White, University of Illinois
Urbana-Champaign
MIT, 6-120
4:00 pm

April 27

Amos Smith, University of Pennsylvania
Harvard Univ., Pfizer Lecture Hall 4:00 PM

April 28

Prof. Uwe Bunz, Georgia Institute of
Technology
“From Large Heteroacenes to Cruciform
Fluorophores”
Boston College, Merkert 130 4:00 pm

Prof. Kelsey Cook, University of Tennessee
“Fourier Transformation of Mass Spectra –
Enhanced Information from Inexpensive
Spectra”
Tufts Univ., Pearson Chemistry Building,
Room P-106
4:30 pm

Amos Smith, University of Pennsylvania
Brandeis University, Gerstenzang 122
3:45 pm

Paul Hanson, Kansas University
Organic Syntheses Seminar
U. New Hampshire, Iddles, Room L103
11:10 AM

April 29

Andrew Borovik, Univ. California, Irvine
MIT, 6-120
4:00 pm

April 30

Tobin Marks, Northwestern University
Harvard Univ., Pfizer Lecture Hall 4:00 pm
Shannon S. Stahl, Univ. Wisconsin
MIT, 6-120
4:00 pm

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

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