

Sigma Xi Today

MAY-JUNE 2006 · VOLUME 15, NUMBER 3

Lindquist to Speak at Annual Meeting

Molecular biologist Susan L. Lindquist is internationally renowned for groundbreaking research on protein folding that, among other things, has provided crucial insights into evolutionary processes and neurodegenerative diseases.

Lindquist will receive Sigma Xi's highest honor, the William Procter Prize for Scientific Achievement, and present a lecture on her research at the Society's 2006 Annual Meeting and Student Research Conference in Detroit, set for November 2-5. (See related article page 286.)

Lindquist is a professor of biology at the Massachusetts Institute of Technology (MIT). Her discoveries have led to a new paradigm in genetics based on the inheritance of proteins with new, self-perpetuating shapes rather than new DNA sequences.

By studying the complex origami-like shapes of proteins, she discovered how structural mistakes can lead to neurodegenerative disorders, including Parkinson's disease.

She and her colleagues have found that misfolding in just one part of a protein can transform it into an infectious material capable of replicating itself. Over time, these misshapen proteins, called prions, can have devastating effects on the brain or can serve as beneficial protein-based elements for perpetuating new biological traits.

Her group has developed yeast cells as "living test tubes" to study protein-folding transitions in normal biology and disease, to test therapeutic strategies and to investigate learning and memory.



Susan Lindquist

Recently, her foray into organic fibers that can self-organize into structures smaller than manufactured materials promises to take the world of biomaterials and nanotechnology to new heights.

"I see biology becoming more and more an interdisciplinary science with physics, chemistry and evolutionary biology all coming together,"

Lindquist says. "When worlds collide, sparks fly—this is allowing us to take old problems and attack them in new ways."

Lindquist served as director of MIT's Whitehead Institute from 2001-2004. She came to MIT from the University of Chicago, where she was a professor of medical sciences, a professor in the department of molecular genetics and cell biology and a Howard Hughes Medical Institute Investigator.

Among Lindquist's many honors are election to the American Academy of Arts and Sciences and the National Academy of Sciences.

A Fellow of the American Academy of Microbiology, she has received the Novartis Drew Award in Biomedical Research, the Dickson Prize in Medicine, and is former secretary of the Genetics Society of America.

A native of Chicago, Lindquist received a B.A. from the University of Illinois and a Ph.D. from Harvard University in 1976.

Visit www.sigmaxi.org for more about the Procter Prize and the annual meeting.

Executive Director To Retire in June

Patrick D. Sculley has announced his retirement effective June 30 after four years as executive director of Sigma Xi, during which he oversaw planning and construction of the Society's new administrative offices.

Should the search for his successor take longer than his planned retirement date, the Sigma Xi board has accepted his offer to serve beyond June 30, in order to effect a smooth transition in leadership.

"Sigma Xi programs and activities have gained a lot of momentum in the past few years, and I very much want to see that continue," Sculley says. "But it's time for me to step back and spend more time with my family. However, I plan to go full-tilt until I walk out the door, and will always remain an ardent Sigma Xi supporter."

He and his wife, Peggy, have four children and five grandchildren, all of whom live in Texas. Sculley had a distinguished career in the U.S. Army prior to his appointment at Sigma Xi, retiring in 2002 with the rank of major general after 29 years of service.

His last position was that of deputy surgeon general of the army medical department, which in 2002 operated eight medical centers, 47 hospitals, 73

continued on page 286

I N S I D E

Sigma Xi Annual Meeting	286
Magazine Wins Award	286
Postdoc Forum	287
Members Win Kyoto Prize	288
All Patents Initiative	288

Sigma Xi Annual Meeting in Detroit To Explore Fresh Ideas in Science

Innovation. Industry. Interdisciplinary investigation. The 2006 Sigma Xi Annual Meeting and Student Research Conference in Detroit will emphasize all three.

November 2-5 is the time and Motor City is the place to explore fresh ideas across engineering and applied science.

The meeting will be held in the General Motors Renaissance Center, Detroit's most recognizable skyline feature, which towers above the redeveloped Detroit River waterfront.

Green building, alternative fuel sources, successors to the carbon economy and biomimetic engineering are just a few of the possible topics. Send us your proposals to present engaging research posters and thought-provoking technical sessions. Visit www.sigmaxi.org for details.

Register online starting August 1 for the 2006 Student Research Conference for undergraduate and graduate students, which will be held November 3-4.

In addition to showcasing student research, the conference offers career development workshops, mentoring and networking activities, panel discussions and other opportunities.

All fields of science and engineering are represented in the undergraduate poster session, with a special category for interdisciplinary research. Advanced graduate students and Ph.D. candidates are invited to make oral presentations. Sigma Xi members serve as judges. Monetary awards are given for outstanding research.

At Sigma Xi's annual meeting, chapter delegates will attend workshops on leadership, major issues facing the research enterprise and chapter management.

Networking activities include discussion groups, roundtables, social events and judging sessions, all of which offer possibilities for interaction with colleagues.

Research presentations will be given by eminent researchers and accomplished science communicators, including Sigma Xi's 2006 award winners.

Special guest speakers include:

Susan Lindquist, professor of biology, Massachusetts Institute of Technology, who will receive the William Procter Prize for Scientific Achievement.

Alan Lightman, physicist, novelist, and essayist, winner of the John P. McGovern Science and Society Award.

W. Raphael Hix, Oak Ridge National Laboratory, recipient of the 2006 Sigma Xi Young Investigator Award.

Claudia Dreifus, author and educator, and *Oregonian* science writer **Richard Hill**, both of whom will be inducted as honorary Sigma Xi members.

Magazine Wins Award

American Scientist magazine was recently honored with an award in the 2005 *NewsStand Resource* cover contest for the May-June 2005 issue, which featured a painting by Dick Perez of Philadelphia Phillies pitching legend Robin Roberts.

Roberts was one of the most successful pitchers of his time. The illustration was for an article called "Predicting a Baseball's Path" by A. Terry Bahill, David G. Baldwin and Jayendran Venkateswaran.

All winning covers and honorable mentions can be found in the spring 2006 issue of *NewsStand Resource*, the only trade magazine for the single copy newsstand industry. Visit www.nrmag.com for more information.

Executive Director

continued from page 285

separate health clinics, 172 dental clinics and 14 biomedical research facilities. At that time, the department employed 74,000 military/civilians and had an annual operating budget of more than \$5 billion.



Patrick D. Sculley

The Association of Military Surgeons of the United States named Sculley the 2001 Outstanding Federal Health Care Executive.

Sigma Xi President Lynn Margulis has charged President-elect James F. Baur to lead the search for a new executive director.

"Pat has advanced Sigma Xi on multiple fronts," Baur says. "He set a remarkable pace and accomplished a great deal in a relatively short period. Not only did he bring the Sigma Xi Center into being in record time, he initiated key strategic planning and reorganized the staff to support the Society's goals."

Baur continues, "Sigma Xi is much stronger today thanks to his leadership, and we are very grateful that he will be with us through the transition."

New programs, increased funding, international expansion and the launch of *American Scientist Online* are additional fruits of Sculley's tenure, Baur said.

As examples, he cited the United Nations-Sigma Xi Expert Group, formed to develop practical policy responses to global climate change, and the expansion of Sigma Xi chapters in Mexico and elsewhere.

Sculley received a B.A. in biology at Washington and Jefferson College in 1969 and earned a degree in dental surgery at the State University of New York at Buffalo and a master's in health services management at Webster University.

Postdoc Forum Addresses Key Issues and Next Steps

More than 80 people from around the country attended a two-day Postdoc Forum in January at the Sigma Xi Center to address key issues raised in the landmark Sigma Xi Postdoc Survey.

The survey of 7,600 postdoctoral scientists at 46 American research institutions provided information on everything from job satisfaction to wages and benefits and career development opportunities.

Titled "Professionalizing the Postdoctoral Experience: Next Steps," the forum was hosted by Sigma Xi and the National Postdoctoral Association.

Major support for the forum was provided by the Burroughs Wellcome Fund, the Alfred P. Sloan Foundation and the National Science Foundation.

Plenary topics included "Building a Successful Postdoctoral Program," "Leveraging Existing Resources" and "Leadership and Management Training."

Concurrent sessions focused on designing and implementing key policies for postdoctoral researchers. All groups addressed a set of questions on effective policy implementation.

"What made this conference better than the others I've attended," according to one participant, "is that other institutions are now far enough along in establishing postdoc policies that I am learning from their successes and failures."

Discussion group topics included "Entrances and Exits," dealing with orientations, standard letters of appointment, exit surveys and certificates of completion; and "Conflict Prevention and Management," on authorship policies, grievance procedures and misconduct definitions.

Also discussed were "Plans and Evaluations," addressing forms and guidelines for research/career plans and performance evaluations; and "General Employment Practices,"

involving postdoc classification systems, international postdoc policies and resources, plus tax issues.

Sessions were also held on how to go about establishing a postdoc office and maintain funding for it, as well as how to attract and maintain a diverse postdoc population.

Visit www.sigmaxi.org for reports on the Sigma Xi - NPA Postdoc Forum and the survey.

Subscribe to Sigma Xi's Free E-newsletters

Sigma Xi's free, electronic newsletters are delivered directly to your e-mail inbox. Visit the "free e-newsletters" button at www.americanscientist.org to subscribe.

American Scientist Update previews each issue of the magazine and alerts you when a new issue goes online. In odd months, the *Update* features interviews with well-known scientists and authors, plus news from Sigma Xi.

Science in the News helps readers keep up with advancements in science and engineering as reported in the mainstream media.

Science in the News Weekly condenses top science stories from the daily *Science in the News* bulletins into one concise summary, distributed by e-mail every Tuesday morning.

Scientists' Bookshelf Monthly offers book news, discussion and reviews from *American Scientist Online*.

Sigma Xi International Newsletter keeps subscribers updated on developments in Sigma Xi's international activities and provides links and articles of interest to researchers around the world.



PHOTOGRAPH COURTESY OF BRIAN HART, UNIVERSITY OF CALIFORNIA-IRVINE CHAPTER

In February, Sigma Xi and WGBH/Nova *ScienceNOW* hosted the first national gathering focused on the burgeoning science café movement. Café organizers from Sigma Xi chapters, science museums, public television stations and independently run science cafés met at the Sigma Xi Center. *The New York Times* mentioned the conference in an article on the café movement. A variety of models are being used around the country, but all seek to engage participants in lively, interactive explorations of hot science topics. Visit www.sigmaxi.org for details on this growing phenomenon.

Two Members Receive Kyoto Prize

In April, electronics pioneer George Heilmeier and ecologist Simon Levin, the latest recipients of the Kyoto Prize, participated in the Kyoto Laureate Symposium in San Diego.

Awarded annually by the Inamori Foundation of Japan, the Kyoto Prize is considered among the world's leading awards for lifetime achievement.

It recognizes those who have contributed significantly to human progress in the areas of advanced technology, basic sciences, and arts and philosophy. The prize includes a gift of 50 million yen, or about \$425,000.

Heilmeier, 69, of Dallas is chairman emeritus of Telcordia Technologies, Inc. He was recognized for groundbreaking research in the field of liquid crystals and his contributions to the development of the liquid crystal display (LCD). Heilmeier was inducted into Sigma Xi in 1959.



George Heilmeier

RCA unveiled the world's first liquid crystal display prototypes, created by Heilmeier and his co-workers, in 1968. LCDs are now indispensable in applications ranging from palm-sized mobile phones to the most advanced home theater systems, laptop computers, video games, digital watches, cameras and home appliances.

Levin, 64, a professor at Princeton University, received the award for establishing the field of "spatial ecology" and expanding scientific understanding of the biosphere as a complex adaptive system. Levin has been a Sigma Xi member since 1975.



Simon Levin

His use of mathematical models to understand the complex patterns of the biosphere has made a substantial impact on environmental sciences and led to new methods of environmental protection. Levin's book, *Fragile Dominion* (1999), illustrates how the loss of biodiversity has created direct threats to human survival, and identifies a series of actions urgently needed for maintaining biodiversity.

TOYchallenge Nationals

Hundreds of middle school students from around the country will compete in Sally Ride Science's TOYchallenge Nationals at the San Diego Aerospace Museum on April 29, and at the Sigma Xi Center in Research Triangle Park, North Carolina, on May 6.

The East Coast Nationals will be open to the public from 12:30-4:00 p.m. Visit www.sigmaxi.org for details.

Sigma Xi Hosts All Patents Initiative

Sigma Xi is the project incubator for a collaborative effort called the All Patents Initiative (www.allpatents.org) that is designed to make information from U.S. patents more accessible and understandable.

Launched in 2004, the initiative is an on-going collaboration between universities, non-profits and businesses with an interest in exploring the history of innovation.

The goal is to build tools to explore innovation as an evolutionary process and to enable researchers of all kinds—rather than just patent lawyers—to navigate patent data in meaningful ways.

Tools under development will allow exploration of the temporal, topical, geographical and social domains of innovation as expressed within patents. Researchers will be able to ask longitudinal questions about innovation and conduct specific inquiries not allowed by current search tools or available datasets.

In this sense the initiative will support research needs of the social sciences community as well as, for the first time, exposing the full value patent collection as part of our national heritage.

As we develop an innovation-based economy, our need to explore both the legal and social function of intellectual property becomes increasingly significant to our nation.

Through its tools and data, the All Patents Initiative will enable exploration and understanding of the connection between intellectual property and innovation within the academic community as well as by the general public.

It also hopes to support the current call to action from the National Academy of Sciences, among others groups, for modernization of the U.S. Patent system.

"Sigma Xi provides an excellent foundation for project incubation," according to Kevin Webb, a member of the All Patents team and a founding partner of Tackle Design, Inc., based in Durham, North Carolina.

"They have not only provided a great space in the Sigma Xi Center for us to work," Webb continues, "but have been instrumental in the development of our organizational and funding strategies."