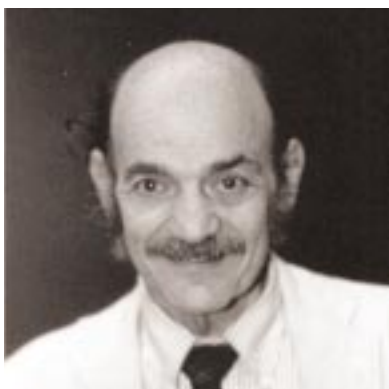


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Alexander Rich to Receive Procter Prize



Massachusetts Institute of Technology biophysicist Alexander Rich has been selected to receive Sigma Xi's 2001 William Procter Prize for Scientific Achievement. He will deliver the Procter Prize Address at the annual meeting in Raleigh, North Carolina, in November.

Sigma Xi's highest honor, the annual Procter Prize recognizes scientific achievement and an ability to communicate the importance of that research to others. It includes a \$5,000 prize and the privilege of selecting a student to receive a \$5,000 Grant-in-Aid of Research

William Thompson Sedgwick Professor of Biophysics at MIT, Rich is best known for his discovery of left-handed DNA, or Z-DNA, and the three-dimensional structure of transfer RNA, key discoveries that have led to an understanding of the role and function of RNA and DNA molecules in heredity.

Rich has long been recognized as a preeminent researcher in structural molecular biology, a field that seeks to understand the molecular architecture of living organisms. In 1979 he led a team of researchers at MIT that startled the world of structural biology with the announcement that

they had found a "left-handed" form of DNA. The new form, coiled in the shape of a left-handed screw, was called Z-DNA because of its zig-zag backbone, but its purpose remained a mystery for many years.

In 1995 his research team reported the first biological role of Z-DNA in helping an "editor" protein change the genetic message of RNA. More recently, Rich described in the journal *Science* (June 11, 1999) how the three-dimensional structure of Z-DNA binds to a protein involved in editing genetic messages important in a number of brain receptors.

President Clinton recognized Rich for his outstanding scientific achievements with the Medal of Science in 1995. His other awards include election to the National Academy of Sciences, the Philosophical Society, the French Academy of Sciences, the Russian Academy of Sciences and the Pontifical Academy of Sciences (at the Vatican).

He has received several honorary degrees, as well as the Rosentiel Award in Basic Biomedical Research, the Bower Award for Achievement in Science, the Linus Pauling Medal from the American Chemical Society and the Merck Award from the American Society for Biochemistry and Molecular Biology.

Born in Hartford, Connecticut, in 1924, Rich served with the U.S. Navy from 1943 to 1946, received his A.B. and M.D. degrees from Harvard University and joined the faculty at MIT in 1958.

From 1969 to 1980 he was an investigator in NASA's Viking Mission to Mars, working on experiments designed to look for life on the planet. Rich lives in Cambridge, Massachusetts, with his wife Jane. They have four children.

NSF Funds Chapter-Based Ethics Workshops

A grant from the National Science Foundation will support chapter-based ethics workshops and related activities in follow-up to the 2000 Sigma Xi Forum *New Ethical Challenges in Science and Technology*.

The workshop series will focus on moving the discussion of ethics in research onto specific campuses and into their institutional agendas. Selected Sigma Xi chapters will be chosen to work with staff and campus administrators to design a workshop aimed at:

- Introducing the campus community to the importance of ethical considerations for all students
- Opening a dialogue about developing and refining the institutional capacity to deal with ethical issues, and
- Showcasing methods of introducing ethical considerations into instructional programs

While the format will vary from institution to institution, the program of each workshop will feature a balance of individual presentations, demonstrations, group discussions and working sessions. For more information visit <www.sigmaxi.org>.

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Rodriguez Wins Young Investigator Award

Molecular and cell biologist Henry Rodriguez at the National Institute of Standards and Technology (NIST) has been selected to receive the 2001 Sigma Xi Young Investigator Award in the life sciences.

The annual award honors researchers within 10 years of their highest degree and alternates between the life sciences, including social sciences, and the physical sciences, including mathematics and engineering. It carries a \$5,000 prize. A talk by the recipient is one of the highlights of Sigma Xi's annual meeting.

Rodriguez has been at NIST since 1998, where he is a project leader in the Biotechnology Division. He received his B.S. and M.S. at Florida International University and his Ph.D. in 1992 at Boston University.

Among his scientific accomplishments are a variety of molecular biological methods with exciting potential applications in basic research and medicine. His development of purifying genes as DNA fragment lengths has helped streamline the enrichment process, with immediate application in the general area of genomics.

His work has also led to greatly increased sensitivity of a polymerase chain reaction-based assay called ligation-mediated PCR in detecting and mapping oxidative damage to DNA in mammalian genes. Its most significant application will be to the analysis of the levels of DNA damage, an area of great importance in the fields of medical science, basic genetics, mutagenesis and carcinogenesis.

Recently, Rodriguez has been involved in the development of high-performance liquid chromatography/mass spectrometry (LC/MS) for the measurement of oxidative damage to DNA caused by oxygen-derived free radicals. His other area of research is tissue engineering where he is using various technologies to address the importance and



the need of biomarkers that will ensure the safety and viability of tissue-engineered products.

"The initial studies using techniques developed by Henry and his colleagues have revolutionized our thinking about how cells convert DNA damage to mutations," David M. DeMarini at the U.S. Environmental Protection Agency said in his nomination letter. "This has a great impact on the field of carcinogenesis, because where in the genes and how much DNA damage is produced by a mutagen influences where and how many mutations occur – and such mutations may be important in cancer causation."

Rodriguez is known not only as a creative and energetic scientist, but also as a fine communicator, both written and orally. A popular speaker, he has been invited to give over 22 lectures, both in the U.S. and abroad. He has 24 publications in peer-reviewed journals, eight book chapters and is the co-editor of the book *Oxidative Stress and Aging: Advances in Basic Science, Diagnostics and Intervention*, scheduled for publication in November.

Rodriguez is the co-founder of the Oxidative Stress and Aging Association, a society dedicated to the advancement of diagnosis and therapeutic approaches concerning oxidative stress and related diseases. In addition to Sigma Xi, his professional affiliations include the American Association for Clinical Chemistry, The Oxygen Society, The Oxygen Club of Greater Washington D.C., and the Maryland Bioscience Alliance/Technology Council of Maryland.

Book Club Inspires Lively Discussion

This is the first in a series on successful programs that may have wide appeal for Sigma Xi chapters.

One of the keys to the success of the Whitman College-Walla Walla College Sigma Xi Book Club is the selection of books that are enlightening and provocative but light enough to qualify as recreational reading.

"The book club provides an opportunity to have interdisciplinary discussions involving faculty, staff, school teachers and members of the public," notes Susan Weiler, chapter president and club organizer.

Announcements about the book club have appeared in the local newspaper, on campus, in the campus bookstore and in faculty/staff e-mail bulletins, helping to raise awareness about Sigma Xi. "E-mail invitations to area school teachers and principals have created more connections with the local schools," Weiler says.

For any chapter considering a book club, Weiler recommends *Noah's Flood: The New Scientific Discoveries About the Event That Changed History* by Walter Pitman, Anastasia Sotiropoulos (illustrator) and William B. F. Ryan. The topic is familiar to most people, is not difficult reading and involves several academic disciplines.

Weiler's other suggestions include:

- Discussing three books a year has worked well.
- Select books that cut across disciplines and can be appreciated by a wide audience.
- Have the group decide on titles; book reviews in *American Scientist* offer a good starting point.
- Keep all announcements about the club and book selections light and informal.

For more information, contact Lisa Rhoades at lrhoades@sigmaxi.org or Susan Weiler at weiler@whitman.edu.

2001 Sigma Xi Forum to Revisit “The Two Cultures”

The 2001 Sigma Xi Forum *Science, the Arts and the Humanities: Connections and Collisions*, will focus on the reciprocal influences of science, in its endeavor to understand nature; the humanities, in their essential role as the shapers of values; and the arts, as acts of creation that speak to our emotions.

The conference will be held November 8-9 at the Sheraton Capital Center in Raleigh, North Carolina, in conjunction with the Society’s annual meeting. Through invited presentations and contributed papers, exhibits, demonstrations and presentations, the forum will endeavor to offer a rich panorama of these influences, both historic and contemporary.

Among other topics, the basic premise of C.P. Snow’s *The Two Cultures* (1959) will be revisited, in which he maintained that the breakdown of communication between the sciences and the humanities –

the “two cultures” of the title – was a major hindrance to solving the world’s problems.

In addition, the program will span a variety of contexts: from the quest for beauty in science to the use of science and technology to create beauty; from the influence of humanistic values and artistic conceptions on how science is conducted to the influence of scientific discoveries on the humanities. The special case of engineering, part science and part creation, like the arts, will also be considered.

The 2001 Forum topic was partly motivated by the fact that the new Sigma Xi Center building currently under development will be located next door to the National Humanities Center in Research Triangle Park, North Carolina.

Plans call for participation in the forum by scholars from the Humanities Center, as well as substantial involvement by the national

network of scholars represented by Phi Beta Kappa.

For program updates and other information, including a call for papers, visit <www.sigmaxi.org>.

Contributed poster presentations or demonstrations will be accepted through September 1. Abstracts may be submitted online via the Sigma Xi Web site, www.sigmaxi.org, or by e-mail to forum@sigmaxi.org. Submissions should include a title, list of authors, 250 word abstract and full contact information for the presenting author.

Acceptance of papers or demonstrations for presentation will be at the discretion of the organizing committee, and authors will be notified by September 15. All presenting authors will be required to register for the Sigma Xi forum, and accepted abstracts will be published on the Sigma Xi Web site. For more information, contact forum@sigmaxi.org.

Plasma Grants Support Promising Research

Christiane Röckl, a Ph.D. candidate at the University Hospital Zurich in Switzerland has been awarded a Sigma Xi-Consortium for Plasma Science Grant-in-Aid of \$5,000 to support her work in developing methods to analyze the binding between plasminogen and pathological forms of prion proteins.

Prions have been implicated as the possible infectious agent in the human form of “Mad Cow Disease” (transmissible spongiform encephalopathy), an increasingly hot topic following recent European outbreaks of the disease.

In a related development, research advanced in part by a Sigma Xi-Consortium for Plasma Science Grant-in-Aid has been hailed as offering new hope for detecting and removing prions from the world’s human blood supply.

Grant recipient Michael Fischer, a member of an internationally renowned group in Switzerland and Austria, was lead author on a paper in the November 23 issue of *Nature* about this important work. The

report, “Binding of Disease-Associated Prion Protein to Plasminogen,” describes a circulating blood protein that appears to bind specifically to the pathogenic form of prion protein associated with new variant Creutzfeldt Jacob Disease affecting humans.

The funding for Röckl’s and Fischer’s work comes from a special Sigma Xi Grant-in-Aid of Research fund established by the Consortium for Plasma Science to support research into methods of inactivating viruses and other pathogens in human blood plasma.

Multiple grants of up to \$5,000 are available annually for research in this field. Apply on-line through the Grants-in-Aid of Research site, accessible via the “Programs” link at <www.sigmaxi.org>. Or contact Julia Reed at gjar@sigmaxi.org for further information. Deadlines are March 15 and October 15 annually.



2000 Ethics Forum Proceedings Now Available on the Web

Publication on the World Wide Web of the proceedings for the 2000 Sigma Xi Forum *New Ethical Challenges in Science and Technology* marks the first time the Society has used this relatively new medium to publish a major report.

Web publication offers a number of advantages. "It's a very cost-effective way of making the proceedings more generally available," according to Sigma Xi Executive Director Peter D. Blair, "and also gives us the option of embedding links to useful information and related Web sites within the text, thereby broadening the frame of reference.

"This was one of the most interesting and provocative programs we've offered in our forum series," Blair continued, "with a splendid array of plenary talks and panel discussions. I urge members to review the proceedings on the Web."

Also for the first time, digital video of forum plenary sessions is available for viewing on demand via the Society's Web site. The digital archive includes a panel discussion on "Intellectual Freedom and the National Laboratories" led by John C. Browne, director of Los Alamos National Laboratory.

Forum plenary talks were given by William Wulf, president, National Academy of Engineering; Robert C. Dynes, chancellor, University of California, San Diego; Cliff Stoll, best-selling author and computer maven; David C. Clark, director of research affairs, Rush-Presbyterian-St. Luke's Medical Center; Francisco J. Ayala, professor of biological sciences, University of California, Irvine; and David L. Goodstein, vice provost, California Institute of Technology.

In his talk, Wulf considered the top engineering feats of the last century and warned that engineered systems are becoming too complex to predict how they will behave, which in itself creates ethical dilemmas. Ayala gave an insightful look at the



sometimes contentious convergence of science, religion and education in the U.S., and Stoll provided a high-energy refutation of the popular claim that computer technology is the key to a successful future.

Dynes outlined several case histories to illustrate the kinds of ethical problems that are arising on the nation's campuses, and Clark talk about ethics in medical research within the context of the financial pressures many institutions are experiencing. Goodstein's defense of Nobel laureate Robert Andrews Millikan, which was this year's John P. McGovern Science and Society Award address, also appeared in the January-February issue of *American Scientist*.

Breakout topics included the teaching of ethics, oversight of research staff by the principal investigator, responsibilities of scientists to society, the new federal research misconduct policy, bioethical challenges on the horizon, educational resources to increase ethical awareness, some new wrinkles on faculty conflicts of interest, intergenerational ethics and Web resources for solving ethical problems.

For more than 100 years, ethics in research has been a primary focus for

Sigma Xi. The 2000 Forum will serve as a point of departure for related activities under the aegis of the developing Sigma Xi Center in Research Triangle Park, North Carolina.

"We have visited some of these issues before, Blair observed, "and no doubt will visit them again in the years ahead. We at Sigma Xi are pleased to add this report of the 2000 Sigma Xi Forum, to the growing literature in this fast-paced field."

A printed proceedings volume has also been produced in limited quantity for distribution to forum participants and sponsors. It is available to Sigma Xi members and the general public through the Society's administrative offices at 800-243-6534 or by ordering it on the Web at <www.sigmaxi.org>.

The 2000 Forum provided an opportunity to discuss Sigma Xi's latest ethics publication, *The Responsible Researcher: Paths and Pitfalls*, which covers a number of issues that have arisen since *Honor in Science* was first published in 1984. Among them are grant pressures on professors and their effects on the mentoring process and academic/industrial conflicts of interest.

While *Honor in Science* was aimed primarily at graduate students, the new booklet is intended for a broader audience, including undergraduates, postdocs, junior faculty, senior faculty, deans and department chairs, government and industry managers, as well as researchers in government, industry and non-governmental organizations. The 64-page booklet is also available through the Society's administrative offices.

The 2000 forum was the latest in a national and international series initiated more than a decade.

Featuring leading researchers and policy-makers, recent Sigma Xi forums have focused on undergraduate science education reform, international cooperation in science and technology, trends in industrial innovation and K-12 science education.