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The Rockefeller University

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# news & notes

March 26, 1993 Volume 3, Number 25

The Rockefeller University

## RU trustees promote two faculty members



John Kuriyan



Stephen Burley

### *Kuriyan named professor; Burley, associate professor*

On the recommendation of the Committee on Scientific Affairs, The Rockefeller University Board of Trustees voted to promote John Kuriyan to full professor and Stephen Burley to associate professor at its meeting Wednesday.

"I am gratified that these appointments came from within the university," said President Torsten Wiesel. "These promotions are an acknowledgment of the important and widely recognized work that Dr. Kuriyan and Dr. Burley have done here and an affirmation of their potential for creative work in the future. In addition, I believe they will help strengthen the fields of structural biology and biochemistry at the university."

Kuriyan joined Rockefeller as an assistant professor and university fellow in 1987, and was promoted to associate professor in 1992. In addition to his position at the university, he was named an investiga-

tor of the Howard Hughes Medical Institute (HHMI) in 1990.

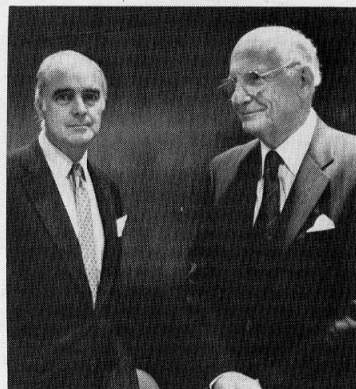
Kuriyan's research interests are in x-ray diffraction experiments and computer simulations aimed at characterizing the three-dimensional structures and action of biological macromolecules. In collaboration with Michael O'Donnell of Cornell, Kuriyan's laboratory revealed a part of DNA polymerase enzyme that encircles DNA and moves along the double helix during gene duplication. Working with Professor Hidesaburo Hanafusa and Associate Professor David Cowburn, last fall Kuriyan provided the first views of the three-dimensional structure of protein regions called SH2

domains, a crucial element in the matrix of cellular communication. The work has recently resulted in an elucidation of the specificity of the binding of SH2 domains.

Kuriyan received a B.S. in chemistry from Juniata College in 1981, and a Ph.D. in physical chemistry from the Massachusetts Institute of Technology in 1986. He was subsequently a postdoctoral fellow in the Department of Chemistry at Harvard University.

Burley's work focuses on the process by which biomolecules recognize each other and coordinate diverse biochemical events. Using x-ray crystallography, he is studying the role of the molecular recognition process in regulating the expression of genes in eukaryotes. Recently, he was the first to show the three-dimensional structure of the TATA-box binding protein, the key protein underlying all eukaryotic gene transcription.

Burley received a B.Sc. in physics from the University of Western Ontario in 1980, a D.Phil. as a Rhodes scholar from the University of Oxford in 1983, and an M.D. from Harvard Medical School in 1987. He then worked as a research resident in internal medicine and protein crystallography at Brigham and Women's Hospital and the Department of Chemistry at Harvard University. He received an appointment from Rockefeller, and from HHMI, in Dec. 1990.



Chairman of the Board  
Richard Furlaud (right)  
congratulates D. Ronald  
Daniel on his appointment.

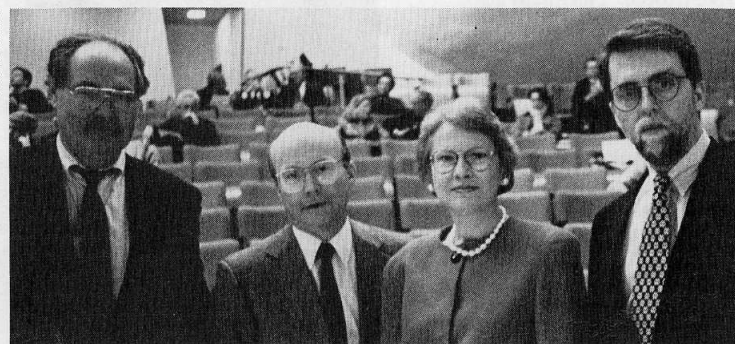
## New trustee elected to board

The Rockefeller University Board of Trustees elected a new member to its ranks on Wednesday. D. Ronald Daniel, a director of McKinsey & Company, Inc., has long been active in educational and research institutions.

In addition to his responsibilities at McKinsey & Company, Daniel serves as treasurer of Harvard University, a member of Harvard's seven-person Corporation, a member of the Board of Overseers, chairman of the Harvard Management Company, and chairman of the Board of Fellows of the Harvard Medical School. Daniel is also a member of the board of The Markle Foundation and The Brookings Institution.

Daniel has been a management consultant for over 35 years and has established relationships with the senior management of many leading corporations. He has directed a wide range of assignments for clients including petroleum and chemical firms, consumer products companies, technology-based businesses, international trading and commodity enterprises, and commercial banks. He entered McKinsey & Company from the U.S. Navy after having managed one of the country's earliest, large-scale computer installations.

Daniel graduated from Wesleyan University with a B.A. and from the Harvard Graduate School of Business Administration with an M.B.A. He also holds an Honorary Doctor of Humane Letters degree from Wesleyan.



The university hosted a seminar "The Business of Science: Can New York Be Competitive?" on Wednesday. Panelists were (left to right): Stanley Brezenoff, executive director of the Port Authority of New York and New Jersey, John Rowe, president of The Mount Sinai School of Medicine and Mount Sinai Medical Center, Trustee Alair Townsend, publisher of *Crain's New York Business*, and Christopher Hill, senior policy analyst at RAND Critical Technologies Institute.

2 Applicants revisit  
Tri-Institutions

3 Gene responds  
to birdsong

4 RU performers  
show talent



## AIDS researcher to speak on viral replication

Bryan Cullen, associate professor at Duke University School of Medicine, will speak on the "Regulation of HIV-1 Replication" at the Friday lecture today (Mar. 26).

Research into the Human Immunodeficiency Virus type 1 (HIV-1)—the agent that causes most cases of AIDS—has demonstrated that the virus encodes two RNA-sequence-specific regulatory proteins, Tat and Rev, which control HIV-1 gene expression. In his lecture, Cullen will explain how findings from his laboratory may elucidate the action of these viral regulatory proteins.

Cullen received an M.S. in virology from the University of Birmingham Medical School in 1974 and a Ph.D. in microbiology from the New Jersey Medical School in 1984. In 1990, he was named associate investigator for the Howard Hughes Medical Institute. He was also named associate professor in the Department of Microbiology, and associate medical research professor in the Department of Medicine at Duke University School of Medicine. In 1991, Cullen was given the additional title of associate professor for the section of genetics at Duke.

A recipient of the Eli Lilly Molecular Biology Contact Award in 1989, and an Alexander von Humboldt Foundation Research Award in 1993, Cullen is a member of the American Association for the Advancement of Science, the American Society for Microbiology, and the American Society for Virology. He is also a member of the Scientific Council of the American Red Cross, the Scientific Council of the American Foundation for AIDS Research, and the Duke Center for AIDS Research of the Duke University Program in Genetics and the Duke Cancer Center. Cullen is associate editor of *Cell*, and serves on the editorial boards of the *Journal of Virology*, *AIDS*, and *AIDS Research and Human Retroviruses*.

The Rockefeller University's Friday Lecture Series is free and open to the public. Today's lecture is hosted by Professor Robert Roeder. As customary, the lecture will be held at 3:45 P.M. in Caspary Auditorium and will be preceded by tea at 3:15 P.M. in Abby Aldrich Rockefeller Hall.

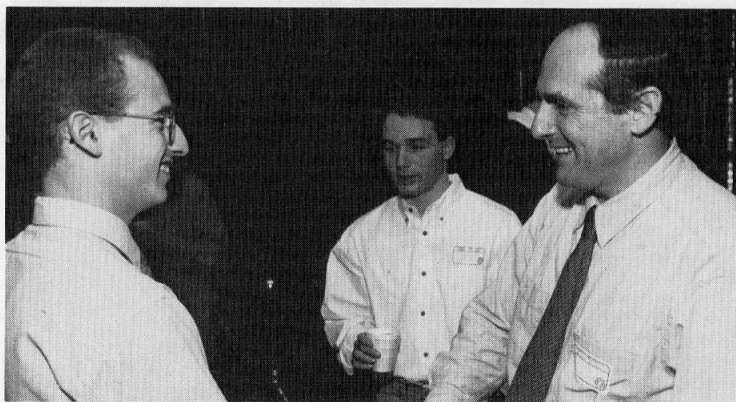
## M.D.-Ph.D. applicants come back for second look

While rejection may be hard to deal with, too many acceptances can also present problems. Faced with the difficult task of choosing among the country's most prestigious biomedical institutions, two dozen of the applicants accepted into the Tri-Institutional M.D.-Ph.D. Program visited Cornell, Sloan-Kettering, and Rockefeller for a second look on Monday.

Participants in the "Revisit Day" took part in a number of activities, including an informal lunch with six current biomedical fellows, individual meetings and tours of laboratories, and dinner with professors and biomedical fellows. They also heard presentations from faculty members, among them President Torsten Wiesel, Professor and Vice President for Medical Affairs Zanvil Cohn, Professor Ralph Steinman, and Associate Professor Stephen Burley.

Sheila Krauss, Tri-Institutional M.D.-Ph.D. Program coordinator who organized the day's events, said: "We want these applicants to learn as much as possible about our program from the faculty and students. We want to show them that this is the best program for them and that New York is a terrific place to live and study."

Steinman, who directs the pro-



Professor Ralph Steinman (right) greets one of the applicants accepted into the Tri-Institutional M.D.-Ph.D. Program Monday.

gram at Rockefeller, explained that the association between three different research facilities affords students a broad number of fields and topics to choose from. "But I think that, first and foremost, it is the quality of the science on these three campuses that draws students," he said.

The applicants—some of whom had come from as far away as California—used what they learned at the Revisit Day to help decide which schools to attend. "It's a choice that I never seriously thought I would have to make," said Johnny Chang, a senior at the University of California at

Berkeley, who was accepted at the University of California at San Francisco, the University of Pennsylvania, and the Tri-Institutional M.D.-Ph.D. Program. "I think my decision will rest primarily on my interactions with the students and my gut feeling for the place. So far, I have found the faculty and students here to be very approachable. I like that."

The new M.D.-Ph.D. class will arrive by July 6. During their first two years, students will study the pre-clinical curriculum at Cornell University Medical College. They will then work in a laboratory at one of the three institutions to complete the requirements for a Ph.D. degree, a process that usually takes three or four years. In the final 14 months of the program, students participate in clinical rotations at Cornell University Medical College.

## RU trustee nominated as ambassador

President Clinton has nominated Pamela Harriman, a trustee of The Rockefeller University, as ambassador to France.

Harriman has been affiliated with The Rockefeller University since 1977, first as a member of The Rockefeller University Council, then, after 1979, as an active trustee. Harriman also serves as a director of the W. Averell and Pamela C. Harriman Foundation and the Mary W. Harriman Foundation. Both foundations have made significant gifts to the university, most recently supporting the new John D. Rockefeller, Jr. and David Rockefeller Research Building.

Born in England, the daughter of the 11th Lord Digby, Harriman came to this country in 1959 and was naturalized in 1971. She was introduced to politics during World War II as the wife of Randolph S. Churchill, son of British Prime Minister Winston Churchill. A subsequent marriage to the late Averell Harriman, who was ambassador to Moscow and later governor of New York, acquainted



Trustee Pamela Harriman, here shown attending the Rockefeller Research Building's dedication festivities, has been nominated as a U.S. ambassador.

Harriman with American politics.

Harriman is now a prominent figure in community and political affairs in both New York City and Washington, D.C. She is also a leading fund-raiser for the Democratic Party.

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# RU student ponders songbird calls—and a gene they activate

By Mika Ono Benedyk

For territorial male birds, spring is a busy season. Not only do they master new songs, but they also learn to recognize the songs of their neighbors so they can distinguish familiar birds from unfamiliar ones who must be driven out of the area.

Claudio Mello, fifth-year student in the Nottebohm lab, is studying the genetic mechanisms that may help to shape—and explain—the territorial nature of male songbird behavior. Working with Assistant Professor David Vicario and David Clayton, now at the University of Illinois, Mello has identified a gene called ZENK that is activated in the brains of adult male canaries or zebra finches in response to bird-song.

"From previous research we knew that ZENK was an immediate early gene, one of the first to be activated in a cascade of genetic activity," Mello said. "We also knew it was activated in many parts of the brain in response to a variety of different stimuli, such as changes in the cycle of light and dark. The questions we asked were: can we find the gene in songbirds? Is it turned on by bird-song? If so, where in the brain is it activated?"

## A gene turned on by song

After about a year of work, Mello and his colleagues succeeded in finding and cloning the gene in canaries. The researchers called it by an acronym, ZENK, in recognition of its name in a number of rodent species, *zif-268*, *egr-1*, *NGFI-A*, and *Krox-24*. (The human homologue of the gene has also been cloned.)

Once the songbird gene was identified, the researchers devised a study to find out whether it was expressed in the songbird brain in response to birdsong. Adult male canaries and zebra finches were kept isolated in a sound-proof cage for 24 hours. Then, for 45 minutes, different sounds were played to the bird

using a tape recorder: the song of a canary, the song of a zebra finch, or control stimuli, such as tones of defined frequencies or white noise. The researchers then looked at the birds' brains to see whether ZENK was expressed.

The study showed that ZENK was indeed induced by birdsong. It was activated most strongly when a bird heard a song of the same species, for example when a canary heard a canary song, or a zebra finch heard a zebra finch song. But it was also activated, at much lower levels, when a bird heard a song of a different species. The gene did not respond to control stimuli.

These findings, published in the Aug. 1, 1992 issue of *Proceedings of the National Academy of Sciences*, were greeted with some excitement. Professor Emeritus Peter Marler, now at the University of California at Davis, was quoted as saying: "This is one of the first links I'm aware of between research on a natural learning process and the switching on of a gene. It's probably not an exaggeration to call this the dawning of a new era in research on the development of behavior."

Professor Fernando Nottebohm, Mello's advisor, added: "To my knowledge, this is the first example of a gene being turned on by such a narrowly defined stimulus." Both *The New York Times* and *The Journal of NIH Research* ran stories about the research, with catchy headlines like "Singing in the Brain: Bird Song and Gene Expression."

## A surprising location

In addition to showing that ZENK responded to birdsong, the study revealed the areas in the brain where it was activated.

"Finding *where* the gene was expressed was one of our biggest surprises," said Mello. "We had predicted it would be expressed in the 'song circuit,' an area of the brain that had been identified as necessary for the bird to produce song.



Claudio Mello, student in the Nottebohm lab, and his colleagues found that a gene in the songbird brain is induced by birdsong.

But it wasn't activated there. It was activated in an area, called the medial caudal neostriatum or NCM, adjacent to the primary auditory region as well as in areas next to the song circuit."

Vicario, one of the co-authors of the paper, agreed that this finding was unexpected. "Within the field," he said, "our work has helped to focus attention on parts of the songbird brain not previously thought to be centrally involved in the processing of song."

Mello followed up the findings with some experiments that investigated the function of the NCM. "To make a long story short, my mapping suggested that this area is closely related to the auditory structures," said Mello. "The NCM may turn out to act as an intermediary between the brain's primary auditory and motor centers, enabling the bird to decipher information about what it hears so it can act on that information."

Mello believes that the NCM may be the homologue of parts of the auditory cortex in mammals. While birds don't have a cortex, their brains may have evolved to function in a manner similar to that of mammals.

## Back to basics

Throughout these molecular and anatomical experiments, Nottebohm encouraged Mello to continue thinking about the purpose of song perception for birds in the wild.

"Fernando emphasizes that to understand learning and memory, you have to see the animal as a whole, beginning from its natural behavior," said Mello. "These songbirds are extremely territorial, and song recognition seems to play a key role in defending their territory. For example, we did some experiments at the Millbrook Field Research Center where we played a recording of a song of an unfamiliar sparrow within other sparrows' terri-

tory. The territorial sparrows got very excited by the playbacks. They looked all over to find the source of the song. When they found it coming from a speaker, they attacked the speaker." ZENK expression in the NCM of these free-ranging birds was markedly increased.

Mello wondered whether ZENK could play a role in shaping the birds' discriminating behavior toward the bearers of familiar and unfamiliar song. In one of the final sets of experiments to be included in his thesis, Mello added a new level of understanding of ZENK's activity.

Birds, kept alone in a cage, were played the recording of a same-species song over a period of several days. The researchers found that, in this case, the bird became habituated to it and ZENK was no longer expressed. But if they then played a new song to the bird, the gene was once again activated.

This work suggests that ZENK not only responds best to same-species birdsong, but also responds selectively to songs that are unfamiliar, a finding consistent with the birds' aggressive displays to strangers in the wild.

## Questions remain

While Mello plans to graduate from Rockefeller this June, this will not be the last of his work on the gene ZENK, or on the questions that this research raises. In his future as a researcher, Mello hopes to investigate other genes that may be activated with ZENK in response to birdsong, and to look into the possibility that these genes cause changes in the circuitry or morphology of the brain.

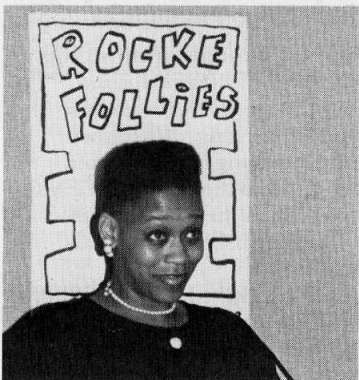
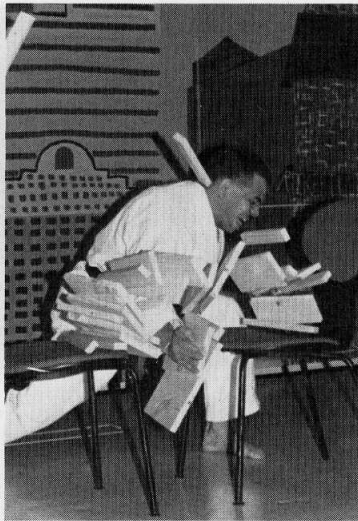
"I have found an area of research I find fascinating, and I hope to stay in the field," said Mello. "This seems to be an excellent system to address the area of research that really interests me, the biological basis of learning and memory."



In the wild, male canaries and zebra finches defend their territory against birds singing unfamiliar songs.



## RU performers show talent—with songs, dances, and punches



*Clockwise, from bottom left.* Deborah Lynch, Mail Room supervisor, acts as master of ceremonies for ROCKEFOLLIES '93, the university talent show held Tuesday night. Assistant Professor Seth Darst plays a piece by Schubert. Jose Santos, former Rockefeller employee, breaks a stack of boards in a karate demonstration. A rhythmic gymnastics team, coached by Administrative Assistant Bozenka Glatt, takes center stage for one act. Research Assistant Yvonne Holland (left) and company perform Swedish folk songs and dances. Retired secretary Dorothy Meyer reads her poetry, "In a Scientific Mode."



## Potpourri

**Tri-Institutional Noon Recital** Duo Musik, featuring oboist Gerard Reuter and pianist Constance Emmerich, will play works by Saint-Saëns, Handel, Nielsen, and Puccini at the Tri-Institutional Noon Recital today (Mar. 26). A recipient of the Pro Musicis International Award in 1992, Reuter has performed at the Caramoor, Marlboro, and La Jolla music festivals and has appeared with orchestras throughout the United States. Emmerich made her concerto debut with the New York Philharmonic at the age of 15. She

has recorded for Columbia and has toured extensively. Admission to the concert, to be held in Caspary Auditorium at 7:30 P.M. on Sun., Mar., 28. The film, directed by Andrej Wajda, is about a young Polish resistance fighter who assassinates the wrong man on the last day of World War II. Admission is free and all are welcome.

### Sunday film

*Ashes and Diamonds (Popiół i Diament)*, in Polish with English subtitles, will be shown in Caspary Auditorium at 7:30 P.M. on Sun., Mar., 28. The film, directed by Andrej Wajda, is about a young Polish resistance fighter who assassinates the wrong man on the last day of World War II. Admission is free and all are welcome.

### Summer student programs

The directors of the summer student programs—SURF, Gateways, and High School Outreach—wish to remind faculty, postdocs, and graduate students who wish to mentor students this summer to return their response sheets to the Deans' Office immediately, at box 270 or fax x8505. Matches for the SURF Program will be made Mon., Mar. 29.

### Recycling

A reminder from Purchase and Supply: the university recycles Hewlett-Packard toner cartridges. For every return, the company makes a \$1 donation to environ-

mental groups. Individuals can drop off used cartridges—packed in the box from a new cartridge—in receptacles in the stockroom or in the 68th St. receiving area.

### Language interpretation

The Rockefeller University Hospital is preparing a list of people who can help with language interpretation. Persons with the ability to communicate in sign language or to speak, read, or write a foreign language should call Jean Dooner, x8405. The list will be kept confidential.

### Beyond the Bench

*Beyond the Bench*, Volume IV, issue I, has been published and is available from the Deans' Office, Founder's Hall A2 or x8086.

### Honor

Professor and Physician-in-Chief Jules Hirsch has been named a fellow of the American Institute of Nutrition.

### Presentation

Research Associate Elizabeth de Oliveira e Silva presented an abstract at the American College of Cardiology in Anaheim, California on the heritability of the quantitative lipoprotein(a) trait in monozygotic twin pairs early this month.

### Alumna

Heather Williams, Rockefeller alumna (class of '85) and adjunct faculty in the Nottebohm lab, was recently promoted to associate professor with tenure at Williams College.

### Appointments

**Postdoctoral Associates:** Jorge H. Delgado-Hansen, Chua lab; Wei Fan, Friedman lab; Jacqueline Gulbis, J. Kuriyan lab; David Andrew Horn, G. Cross lab; Michael Myers, M. Young lab; Riqiang Yan, J. Darnell lab; **Adjunct Faculty:** Francis J. Bullock, Hayre lab; **Guest Investigators:** Xing Ling Cao, Chua lab; Yasukazu Kuroda, McEwen lab; Paul Szabolcs, Steinman lab; Vadim Yuferov, Kreek lab.

### Departures

**Associate Professor:** Anthony I. Sanda, Khuri lab; **Adjunct Faculty:** Zvi Bohak, Manning lab; **Visiting Professor:** Agnes Marie Sa Figueiredo, Tomasz lab; **Postdoctoral Associate:** Mark Blight, S. Simon lab; **Postdoctoral Fellows:** Maria Fatima Horta, Ding-E Young lab; Einar Hallberg, Blobel lab; Hong Rong, Chua lab.



Duo Musik will perform at Tri-Institutional Noon Recital today (Mar. 26)