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The Rockefeller University

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## Board elects two trustees and promotes three faculty

At its spring meeting Wed., Mar. 20, the Board of Trustees elected two new trustees: David Hamilton Koch, a businessman, philanthropist, and chemical engineer who is executive vice president of chemical technology of Koch Industries, Inc. and Walter Eugene Massey, former director of the National Science Foundation (NSF) who is now president of Morehouse College. The Board also approved the promotion of Assistant Professor Ambrose Cheung to associate professor and the appointments of Stephen Duncan in the J. Darnell lab and Melissa Pope in the Steinman lab to assistant professor.

"David Koch and Walter Massey will add considerable strength to the Board, and we all appreciate that they have agreed to devote their expertise to the university. We are sure to benefit from their years of service to the scientific and biomedical communities," said President Torsten Wiesel. "I am also pleased to congratulate Ambrose Cheung and to recognize with this promotion his original work in the Gotschlich-Fischetti lab."

### Koch

Koch holds bachelor's and master's degrees in chemical engineering from the Massachusetts Institute of Technology (1962 and 1963). After working as a research and development engineer in several companies, in 1970 he joined Koch Industries, a company engaged in oil and gas production and refining founded by his father, who invented a novel refining process.

Koch, a trustee for the New York University Medical Center and Memorial Sloan-Kettering Cancer



Courtesy of David Koch

**New trustee David Koch previously served RU as a member of the Rockefeller University Council.**



Courtesy of Walter Massey

**New trustee Walter Massey has been a leader in research and education for more than two decades.**

Center, is a member of the board of directors of Cold Spring Harbor Research Laboratory and of the board of governors of New York Hospital. At Rockefeller, he served previously as a member of the Rockefeller University Council.

### Massey

Massey earned a doctorate in physics from Washington University, St. Louis in 1966. After

holding positions at University of Illinois, Urbana, and Brown University, Massey directed the Argonne National Laboratory from 1979 through 1984. He then moved to the University of Chicago to serve as vice president of research. In 1991, then-President George Bush nominated him as director of the NSF, a post he held for two

See News, page 2

## Lyme disease expert gives Friedheim lecture today

Alan George Barbour, professor at the University of Texas Health Science Center at San Antonio (UTHSCSA), gives the Ernst A. H. Friedheim Memorial lecture today (Mar. 22). His talk is entitled "Antigen Variation in *Borrelia*: A Mirror to the Immune System."

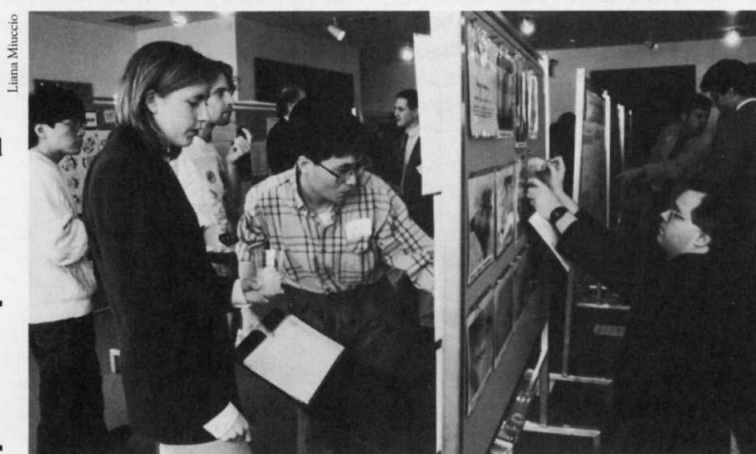
Barbour studies the pathogenesis and prevention of infectious diseases. Early in his research career, while a member of the Epidemic Intelligence Service at the Centers for Disease Control (CDC), he studied echinococcosis and giardiasis in endemic regions. Barbour's early laboratory work at the University of Utah and at the University of Leicester in the U.K. focused on staphylococcal toxic-shock syndrome and intrinsic antibiotic resistance in gonococci.

As a member of the Rocky Mountain Laboratories of the National Institutes of Health, Barbour learned to cultivate the *Borrelia* species that cause relapsing fever, a spirochete disease transmitted by lice and ticks. He later collaborated with Willy Burgdorfer in identifying and isolating the agent of Lyme disease, *Borrelia burgdorferi*, a previously unknown *Borrelia* species. His interest in spirochete diseases led to the identification and characterization of OspA, a protein of *B. burgdorferi* that is now in phase III human trials as a vaccine against Lyme disease. His lab focuses on the development of second and third generation Lyme disease vaccines, in addition to continuing studies of the molecular basis of antigenic variation in relapsing fever.

"Alan has made fundamental contributions to our understanding of antigenic variation and genome organization in *Borrelia*," said Professor George A. M. Cross, who hosts today's lecture. "Because of their similar clinical symptoms, *Borrelia* was once thought to be related to trypanosomes. Today we know *Borrelia* is a bacterium, but you still might mistake it for a trypanosome if you only focused on its

See Barbour, page 2

## Applicants peruse RU via posters on projects



Liana Muccio

At the Dean's Office Open House Fri., Mar. 15, applicants to Rockefeller's graduate program attended a poster session with more than 60 displays on RU research. "The poster session was pivotal," said Dean George A. M. Cross. "It probably had the greatest impact of any single part of the program, not only because of the range and depth of the science on display but because of the lively atmosphere and the many faculty members who were informally accessible throughout the entire period. I suspect that participants from our community enjoyed the event as much as any of the visitors." At left, research associate Yan Luo describes his research in the Roeder lab to an applicant, while head of lab Peter Mombaerts realigns his exhibit.

2 Honor bound

3 Precursor stratagems

4 Food for thought

## Health office arranges employee mammography program

The university's free mammography screening program for female employees age 35 and older will take place Mon., Apr. 8 through Fri., Apr. 12.

For an appointment, call 1-800-8SMART8 between 10:00 A.M. and 5:00 P.M., then complete the related forms available in the Employee Health Office (Hospital 118).

"We're making it easy for people to take good, preventive care of themselves, with this program and the others we bring to campus," noted Mary D. Brust, supervisor of the Employee Health Office. The 15-minute screening procedure will take place in the Rockefeller University Hospital Radiology Department in Founder's Hall 313.

Run by the Memorial Sloan-Kettering Cancer Center (MSKCC), the screening includes

a baseline mammography, which will identify lumps but will not characterize them; a radiological evaluation of the X-rays, which participants and the physicians they specify will receive copies of; and storage of the films.

The American Cancer Society (ACS) estimates that one in 10 women will develop breast cancer in their lives. The MSKCC program follows current ACS guidelines, recommending baseline mammograms for women between the ages of 35 and 40, biennial exams for those between 40 and 50, and annual screening for women older than 50.

Brust noted that while today (Mar. 22) ends the official registration period for RU employees for the "Be Smart!" screening, the program offices will make appointments until April 3.

## News from the Board of Trustees

(continued from page 1)

years. From 1993 to 1995, Massey was provost and senior vice president for academic affairs at the University of California. Since then, he has served as president of Morehouse, where he earned his undergraduate degree.

Recipient of many awards, Massey has served as chairman and president of the American Association for the Advancement of Science and as a board member for the Hewlett Foundation, MacArthur Foundation, and Rand Corporation. He serves on the Commonwealth Fund and on the President's Advisory Board of the Hong

Kong University of Science and Technology.

### Cheung

Cheung investigates *Staphylococcus aureus*, a common pathogen adept at acquiring antibiotic resistance. His goal is to understand the bacteria's genetic control apparatus and the consequences on virulence of its gene products, knowledge that may allow rational design of new antimicrobial agents to control *S. aureus* infections. His research characterizes a regulatory locus on the *S. aureus* organism that influences pathogenesis.

## Barbour

(continued from page 1)

linear genome, its minichromosomes, and the genetic mechanisms that regulate its surface antigens."

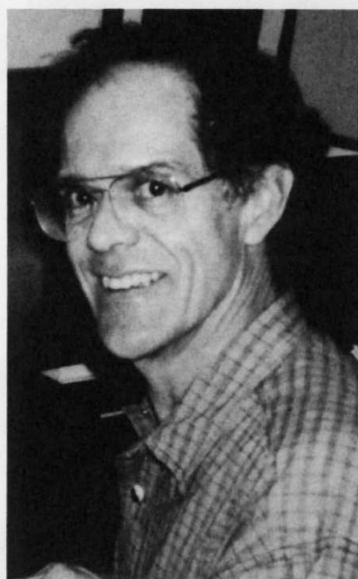
Barbour received his medical degree from Tufts University School of Medicine in 1972. He joined the CDC in 1974 and worked on the World Health Organization's smallpox eradication program in India in 1975. In 1978, he began postdoctoral studies at the University of Utah. Barbour joined the NIH's Rocky Mountain Laboratories, becoming chief of the Arthropod-borne Diseases Section in 1984. He became professor of microbiology and medicine at UTHSCSA in 1986 and was chief of the Division of Infectious Diseases until 1992.

Barbour, a member of the American Society for Clinical Investigation, is chair of the 1996 Gordon Research Conference on

the Biology of Spirochetes.

This annual lecture series on a subject related to the therapy and prevention of parasitic diseases was endowed in honor of Ernst A. H. Friedheim in 1989. Friedheim, born in Zurich in 1899, was a distinguished scientist whose work over half a century furthered the development of new and better treatments for parasitic diseases. Friedheim was a visiting professor at Rockefeller from 1977 until his death in 1989.

The lecture will be held at 3:45 P.M. in Caspary Auditorium and preceded by tea at 3:15 P.M. in Abby Aldrich Rockefeller Lounge. All are welcome.



Alan Barbour worked on the World Health Organization's smallpox eradication program in India in 1975.

After earning his M.D. from Northwestern University Medical School in 1980, Cheung joined the Harbor-UCLA Medical Center at the University of California at Los Angeles. He served there as an intern, resident, fellow in infectious disease, and instructor before joining RU in 1986 as a research associate. He became assistant professor in 1990. Cheung received the New York Heart Investigatorship and a First Award from the National Institutes of Health. He is an established investigator of the American Heart Association and recipient of the Irma Hirschl Career Scientist Award.

### Duncan

Duncan joined Rockefeller as a postdoctoral fellow in 1992 after earning his doctoral degree from the University of Oxford in 1991. He became a research associate in 1995. Interested in liver development, Duncan researches the molecular mechanisms underlying endoderm development.

### Pope

Pope, who earned her Ph.D. in 1992 from the University of Adelaide, South Australia, joined the Steinman lab as a postdoctoral associate in 1992 and became research associate in 1994. She investigates mechanisms that promote the replication of HIV-1 in vivo and how the virus spreads from the initial site of infection.

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"He'll never win the Nobel, but he may get an Oscar."



# Cells leapfrog through adult brain en route to becoming neurons

Follow the leader is not the only game cells play. Cells destined to become neurons in the brain of adult mice play leapfrog too, according to Arturo Alvarez-Buylla, associate professor and head of the Laboratory of Neurogenesis. In a recent publication in *Science*, Carlos Lois, RU graduate fellow, Jose Manuel Garcia-Verdugo, guest investigator from University of Valencia, and Alvarez-Buylla documented a new mechanism of migration used by neuronal precursors.

The migration of neuronal precursors is fundamental to brain assembly, and clues to how these cells move may help in the design of therapies for diseased or injured brains.

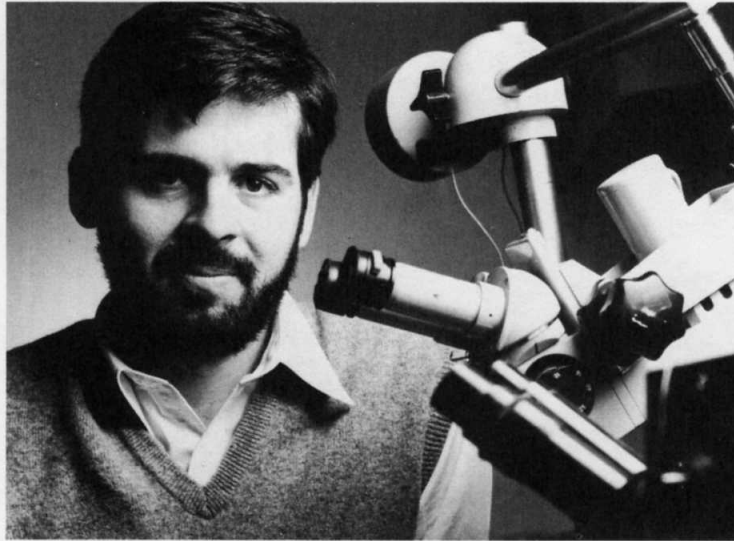
Previous research had revealed two basic forms of neuronal migration in which long processes of glia or neurons serve as tracks that guide the immature neurons to their final destination. In the best studied form, called radial migration, studied in detail in Rockefeller Professor Mary Beth Hatten's laboratory, young neurons ride on long shafts of radial glia.

## Cells journey toward destiny

Scientists generally thought that after brain assembly was completed early in development, the guiding scaffolding for neuronal migration was disassembled and neuronal production terminated. However, past work by Alvarez-Buylla and Rockefeller Professor Fernando Nottebohm, head of the Laboratory of Animal Behavior, demonstrated that long-range migration of young neurons takes place in the brains of adult songbirds. As during development, these young neurons in the brain of adult birds follow the shafts of glial cells towards their destination. The new findings point to a form of migration that does not need glial or axonal shafts.

In the research reported in *Science*, the Alvarez-Buylla lab investigated how young neurons in the brains of adult mice followed a defined pathway called the rostral migratory stream. This pathway takes cells from the subventricular zone in the center of the brain, next to the ventricles, to the olfactory bulb in the front of the brain, where information about odors is processed.

The scientists could not find evidence that radial glial fibers, axons, or cell processes guided the neuroblasts on this journey. Instead, Lois, Garcia-Verdugo, and Alvarez-Buylla discovered that the neuroblasts of adult mice move by follow-



Associate Professor Arturo Alvarez-Buylla and members of his lab recently published a paper in *Science* on a novel method of neuronal migration.

ing and climbing over each other, not by adhering to the elongated processes of guide cells.

## Precursors take a hike

"The neuroblasts literally crawl over each other as they move through a tunnel formed by a type of glial cell," explained Alvarez-Buylla. "In this form of neuronal locomotion, which we call chain migration, neuroblasts use each other as a path—a 'leapfrog' method, if you will—to reach distant parts of the brain where they differentiate into nerve cells."

The neuroblasts may move alone, in groups, or as a combination of both, the net result of which is the translocation of large numbers of young neurons from one part of the adult brain to another.

Not only do these cells move

through a complicated terrain and in large numbers, but they do so at high speeds. The researchers estimate the neuroblast chains move about 1 mm a day, a high speed for neuronal precursor cells, which measure 1/100 of a mm. Within a few days they complete the journey from the subventricular zone into the olfactory bulb, about 5 mm—almost one-quarter inch, which is quite a hike for such cells. The cells keep the to chain migration pattern, until they reach the core of the olfactory bulb. Once in the bulb, the young neurons separate from the chains and disperse radially as individual cells to differentiate into neurons in more peripheral layers.

The glial bodies and branchlike processes revealed in this study form a tubelike structure around the migrating cells. These cells contain

glial fibrillary acidic protein, a marker for astrocytes, and serve to ensheath the chains of elongated neuroblasts. The researchers propose that the tubes of glial cells may set up an environment permissive to migration, but they also may act as road signs to provide directional cues to the neuroblasts so that the cells get to the olfactory bulb. Also, the glial cells may serve as road-blocks to steer the neuroblasts from moving into other regions of the brain.

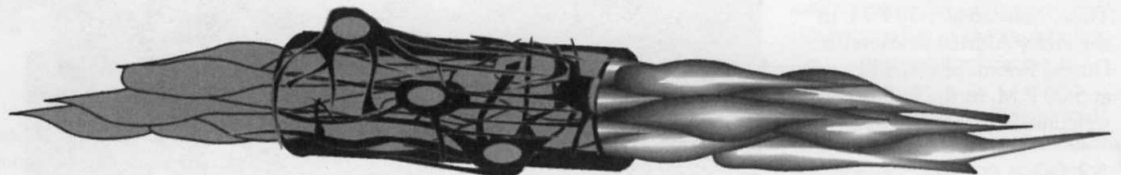
## Questions about the chain gang

The chains of migrating young neurons in the adult mouse brain express the adhesion molecule, PSA-NCAM. Other laboratories have found that migration along the rostral migratory stream, but not along radial glia, is affected when the N-CAM gene is mutated or when the polysialic part is enzymatically removed from N-CAM. "PSA-NCAM may be involved in the grouping of migrating neuroblasts into chains or in their interaction with enwrapping glia," Alvarez-Buylla suggested.

Alvarez-Buylla and coinvestigators are exploring other regions of the developing and adult brain where chain migration might occur as well as how young neurons move in chains. Learning how chain migration is regulated could help in the development of ways to steer neuroblasts to specific locations in the adult brain. Such research could lead to the replacement of neurons at sites of degeneration.

The National Institute of Neurological Disorders and Stroke and the National Institute of Child Health and Human Development supported the study.

Courtesy of Arturo Alvarez-Buylla



The Alvarez-Buylla lab prepared this computer model of how neuroblasts follow each other in a stream of long chains, known as chain migration, as they move through a tubelike structure made of the brain's glial cells and their processes. The neuroblasts can move without using radial glia or axonal guides.

# Potpourri

Courtesy of tel artist



Pianist Hai-Kyung Suh performs works by Chopin, Clementi, Brahms, and Prokofiev in celebration of Women's History Month at the Tri-Institutional Noon Recital today (Mar. 22). The concert, to be held at noon in Caspary Auditorium, is free. All are welcome.

## Senator visit

Barbara Boxer, U.S. senator from California, discusses "Investing in the 21st Century" today (Mar. 22) at 5:30 P.M. in Abby dining room. The lecture, sponsored by Sigma Xi, will be preceded by a 5:00 P.M. reception in the Abby lounge. All are welcome.

## Memorial

Friends of Professor Emerita Maria Rudzinska, who died Fri., Feb. 9, are invited to attend a memorial service Mon., Mar. 25 at 4:00 P.M. in the Abby dining room.

## Cohn forum

Shirley M. Caldwell Tilghman, chair of the Council on Science and Technology at Princeton University, discusses "Who Will Provide Scientific Leadership after 2000?" at the Zanzvil A. Cohn Forum on Health Affairs Tues., Mar. 26 at 5:30 P.M. in the Abby Aldrich Rockefeller Dining Room. Sherry will be served at 5:00 P.M. in the lounge. All are welcome.

## Clinical Research Seminar

Murray Heimberg, Van Vleet Professor at the College of Medicine of the University of Tennessee, discusses "Role of Cholesterol in the Secretion of the Very Low Density Lipoprotein" at the Clinical Research Seminar Wed., Mar. 27 at noon in Nurses Residence 110B.

## Stereo

The Recreational Therapy Department asks for a donation of a used stereo for patients in the Hospital. Please call Anne-Marie O'Brien, x8474.

## Election

Professor James E. Darnell, Jr., was elected as foreign member of the Royal Society of London Fri., Mar. 15. Other foreign members from Rockefeller are Professor Emeritus Christian de Duve, President Emeritus Joshua Lederberg, and President Torsten Wiesel. Professors Nam-Hai Chua and George A. M. Cross are fellows of the Society.

## Lunchtime lesson on healthy food

In honor of National Nutrition Awareness Month, Hospital nutrition research staff will dispense nutrition information in Weiss Café today (Mar. 22) from noon until 1:30 P.M.

"Our goal is for people to understand that they can fit just about any food into a healthful eating style," said Cindy Seidman, director of the RU Hospital's nutrition research service. "The American Dietetic Association sponsors the nutrition awareness month. This year's theme is 'Enjoy the Variety of Food Choices.'"

Posters throughout the café will present nutrition information as will two videos running on small televisions. At an information table, nutrition staff will discuss healthful eating with members of the community and distribute handouts and pamphlets.



Research nutritionist Jolanta Diakun and other Hospital dietary service staff will answer questions at the nutrition awareness program in Weiss Café today.

## Floral award

Gabrielle Riera, director of events and community relations and manager of the President's House, received a first prize in the Salute to Broadway category at the Flower Show at the New York Coliseum Sat., Mar. 9. Her design, in the Broadway Comedy category, was an

interpretation of *Tubes* by the Blue Man Group.

## MS walkathon

Ann McDonagh, research nurse, will participate in the annual multiple sclerosis walkathon Sun., Apr. 21. Contact McDonagh, x8448 or e-mail mcdona, if you would like to be a sponsor.

## Science Outreach teens win local and national awards



Aaron Wong (center), a senior at Stuyvesant High School, won first place at the New York City regional competition of the International Science and Engineering Fair (ISEF) held at Rockefeller Fri., Mar. 15 and Sat., 16. Working in the Desplan lab, Wong investigated "The Anterior Development of the Drosophila Embryo in Absence of the Morphogen Hunchback." Bonnie Kaiser (right), director of RU's Science Outreach Programs, brought the fair to Rockefeller. William T. Golden, chairman emeritus of the American Museum of Natural History, awarded prizes as did Alfred S. McLaren (not shown), president of Science Service, Inc., which sponsors the fair and the Westinghouse Science Talent Search. Second place at the RU event went to Stuyvesant senior Ting Luo, whose work in the Roeder lab on a transcription factor also earned second place and a \$30,000 scholarship in the Westinghouse. Outreach student Aaron Einbond of Hunter College High School won fifth place in the Westinghouse competition for his work in the Hanafusa lab on a binding motif.

\$2.00

The RU Children's School & Infant-Toddler Center

## Sweat Shirt Shop Spring Extravaganza

Seasonal items include water bottles, shorts, and infant clothes. Shop hours: Tuesdays & Thursdays, 11:30 A.M. to 1:30 P.M.

Sale ends Thurs., Apr. 18.

\$2.00 off any purchase of \$20.00 or more with this coupon.

\$2.00

\$2.00

\$2.00