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The Rockefeller University

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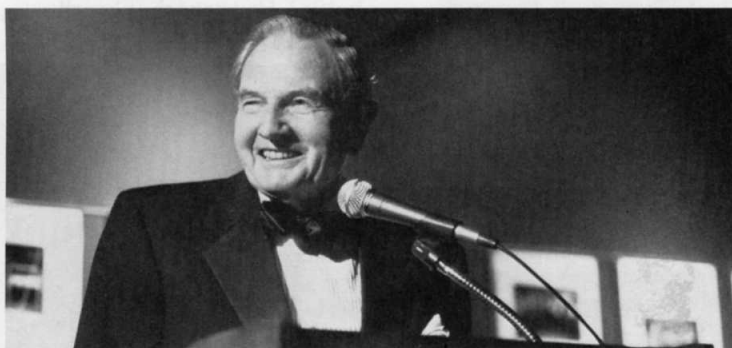
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## 1995 convocation dedicated to David Rockefeller, celebrating 55 years of commitment to the university Faculty and alumni each plan tributes

Rockefeller University will dedicate the 1995 graduation ceremonies to David Rockefeller, in honor of his 80th birthday, his 55th year of service on the board of trustees, and his 25th anniversary as chairman of the board's executive committee. Convocation, scheduled for Thurs., June 15, will be followed by an alumni symposium on Fri., June 16, also in his honor.

"This is a unique opportunity to celebrate with David several important milestones. For more than five decades now, he has made an uncompromising commitment to our research goals and has been extraordinarily supportive of this institution and its faculty," said President Torsten Wiesel. "He always marches with pride in the academic procession and we hope that on this



Among his many contributions, David Rockefeller has served for 25 years as chairman of the executive committee of the board of trustees. Above, he speaks at the 1992 dedication of the John D. Rockefeller, Jr. and David Rockefeller Research Building.

special convocation, many university members will join him."

### Convocation ceremonies celebrate achievement

At convocation, as is Rockefeller's unique custom, dissertation advisors will describe the research achievements of each graduate in

an informative and personal way. David Rockefeller's creative leadership of the university will also be celebrated at the ceremony. The university previously awarded him an honorary degree, in 1980, in recognition of his enduring service

See *Tributes*, page 4

## University introduces girls to the business of science on Take Our Daughters To Work Day

Rockefeller will participate in the third annual Take Our Daughters to Work Day Thurs., Apr. 27 with a morning program that introduces girls ages 11 through 17 to the business of science.

"We invite parents in the university community to bring their preteen and teenage daughters to campus to learn about careers in science and related fields," said Ingrid Reed, vice president for public affairs and corporate secretary. "Studies show that girls ages 11 to 17 often lose interest in science. Meeting women who work here is a great way to encourage their interest."

Take Our Daughters to Work Day is a public education campaign organized by the Ms. Foundation for Women to draw public and media attention to girls' ideas, concerns, and dreams. Girls who choose to visit Rockefeller for the day will be welcomed at 9:00 A.M. by Personnel Office staff in Cohn Library. At 9:20 A.M., Carolyn McGinnis, manager of the Office of Administrative Services at the Howard Hughes Medical Institute, will host a tour of the fly-food kitchen, which feeds the university's five million *Drosophilae*, and

See *Girls*, page 2



Assistant Professor Ulrike Gaul will discuss her research and her career with daughters of the university community.

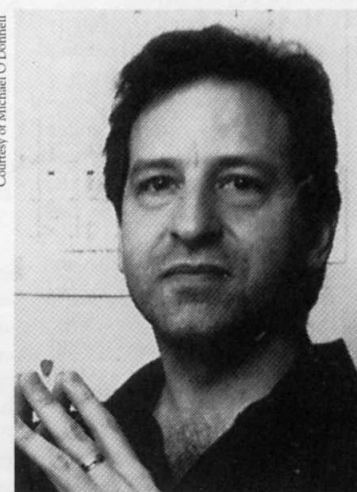
## Molecular biologist discusses replicase of *E. coli* today

Michael O'Donnell, professor of Microbiology and Molecular Biology at Cornell University Medical College, will discuss "Subunit Dynamics of DNA Polymerase III Holoenzyme, the Replicase of *E. coli*" at the Friday lecture today (Apr. 21).

O'Donnell studies the molecular mechanisms of DNA replication in *E. coli* and eukaryotes. Chromosomes in *E. coli* are duplicated by a multiprotein machine called DNA polymerase III (Pol III). O'Donnell and his colleagues have identified a ring-shaped protein component of Pol III, called the  $\beta$  subunit, that acts as a sliding DNA clamp, tethering the polymerase III machinery to the DNA for rapid synthesis. The mechanism by which the polymerase holds on tightly to the DNA while moving rapidly along for accurate DNA replication is conserved across evolution. A fundamental understanding of this most basic of life's processes has profound implications for understanding the origin of aberrations in cellular division, such as those that lead to the growth of tumors.

"Mike is carrying out a detailed biochemical dissection of the components of the machines that replicate DNA, much in the same spirit

See *O'Donnell*, page 2



Michael O'Donnell, professor at Cornell University Medical College, gives the Friday lecture today (Apr. 21).

### Save the date:

### Head of Population Council to speak at Cohn forum May 1

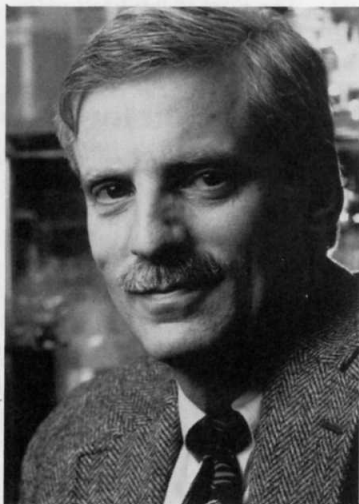
Margaret Catley-Carlson, president, The Population Council, will give a talk entitled, "Will the Population Equation Change in the Post-Cairo Conference Era?" at the Zanvil A. Cohn Forum on Health Affairs Mon., May 1 at 5:30 P.M. in Abby Dining Room. Look for further details in next week's *News&Notes*.

2 University hosts conference on fat

3 Nuclear pore complexities

4 Tykes seek treats in Easter rite

## International conference examines role of fat in health and disease



**Professor Jan Breslow (above)** co-chairs next week's conference with Dimitrios Trichopoulos of the Harvard School of Public Health.

Are fish oils beneficial in disease prevention and treatment? Do *trans* fatty acids pose a serious risk for disease? These and other questions will be addressed at the First International Conference on Fats and Oil Consumption in Health and Disease, to be held Mon., Apr. 24 and Tues., Apr. 25 in Caspary Auditorium.

"This conference is intended to stimulate new ways of assessing the role of fats and oil in healthy individuals and those with acute or chronic conditions," said Professor and Senior Physician Jan Breslow, who co-chairs the conference with Dimitrios Trichopoulos of the Harvard School of Public Health.

Funded by a grant from the International Olive Oil Council and hosted by Rockefeller, New York Hospital-Cornell University Medical College, Harvard Medical School, the Regional Nutrition Center at the New York Academy of Medicine, and the Strang Cancer Prevention Center, the conference brings together scientists from the U.S., Europe, and the Middle East.

Monday's program begins with a welcome by Richard S. Rivlin and introductions at 9:00 A.M. At 9:15 A.M., overview lectures explore dietary fat and current trends and practices in the intake of fat and cholesterol; speakers are William Castelli, Francisco Grande Covian, Andrew Dannenberg, Nancy Ernst, and Antonia Trichopolou.

A program discussing controversies about dietary fat and human health runs from 10:40 A.M. to 5:40 P.M.; speakers are Bruno Berra, Andrea Bonanome, Elliot M. Berry,

William E. Connor, Michael Crawford, Enzo Fedeli, Scott M. Grundy, Martijn B. Katan, Michael Oliver, Antonio Pagnan, David Robbins, David Rose, Samuel Shapiro, Daniel Steinberg, and Walter Churchill Willett; discussants are Ignacio Balaguer-Vintro, Jan Breslow, Andrew Dannenberg, Charles Hennekens, Barbara Levine, Mario Mancini, Manuel de Oya Otero, and Harvey Wolinsky.

This program continues Tuesday morning with a 9:00 A.M. presentation on modifying the weight recommendations for the middle aged, given by Reubin Andres and JoAnn Manson, with debate moderated by Charles Hennekens and Lawrence Leiter. A presentation on the Mediterranean diet at 10:10 A.M. will be given by Barbara Haber, with discussion by Antonia Trichopolou. The conference concludes with a summary by Trichopoulos and group discussion at 11:10 A.M.

Members of the Rockefeller community may attend at no charge. Call Maureen Mulhern, 746-1617, for the schedule of speakers or to register.

## O'Donnell

(continued from page 1)

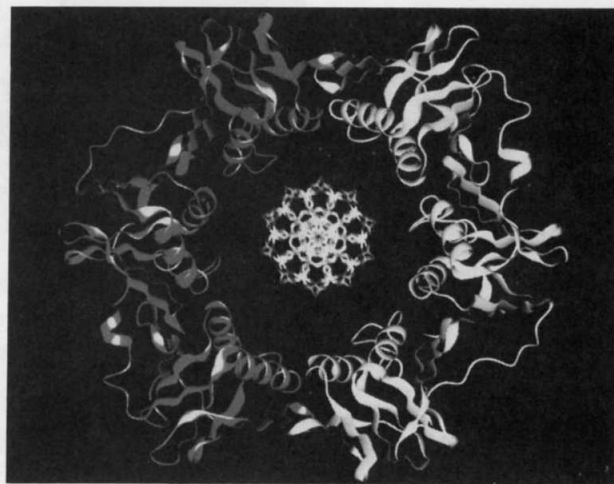
of earlier biochemical analyses of enzyme mechanism," said Professor John Kuriyan. "The rather precise information on how these replicases function is changing our view of how the immense amount of information stored in DNA is transmitted with high fidelity to offspring."

O'Donnell received a Ph.D. from the University of Michigan in 1982. He joined the Cornell University Medical College as an

assistant professor in 1986, was promoted to associate professor in 1991, and to professor in 1993. O'Donnell began his affiliation with the Howard Hughes Medical Institute in 1990, and became investigator in 1993.

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.

Courtesy of Michael O'Donnell



The three-dimensional structure of the ring-shaped  $\beta$  subunit of DNA polymerase III in *E. coli* was determined by the laboratories of O'Donnell and Professor John Kuriyan.

## Girls to tour world of science at Rockefeller

(continued from page 1)

the glasswash and autoclave facility. "It was a lot of fun last year," said McGinnis. "I'm looking forward to it." Horticulturalist Sarah O'Leary will then give a guided tour of the campus gardens.

Shari Zagorski, senior computer graphic specialist, will talk about the scientific support services provided by the Media Resource Service Center at 10:40 A.M. Zagorski said, "In addition to the tour, I'll give a demo on the com-

puter, something colorful and fun."

Next on the itinerary, at 11:30 A.M., is Assistant Professor Ulrike Gaul's Laboratory of Developmental Neurogenetics. "I plan to show them a few fly mutants with interesting morphological defects, but nothing that looks like science fiction," Gaul said. She will also speak to the girls about her research after they lunch at noon.

At 1:00 P.M., the girls may join their parents at their workplaces.

Because of safety concerns, organizers of the campus event request that program participants working in labs obtain approval from lab heads. Young visitors should be closely supervised at all times.

Call Theresa Smiling, x8058, to register.



Shari Zagorski, senior computer graphic specialist, will show girls who visit RU on Take Our Daughters to Work Day computer graphics programs that assist scientists in presenting their work.

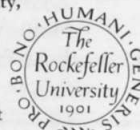
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# Researchers explore complexity of nuclear pore complex

by Susan Blum

Deep within the cell lies its *sanctum sanctorum*—the nucleus—wherein are cached the genetic text of life and the molecular clerics that transcribe its message.

"Entry into this inner sanctuary is highly regulated; it's a great privilege to be there," said Rockefeller cell biologist Günter Blobel. He and his colleagues are studying the portal through which worthy substances pass—a circular structure whose interplay of protein struts, rings, and buttresses rivals the engineering feats of many a Gothic cathedral.

This opening is called the nuclear pore complex (NPC). It is large, weighing in at about 125 million daltons, or 25 times the size of a ribosome. It is complex, consisting of perhaps up to 100 proteins. And it is unusual: Unlike the openings to other cellular organelles, the NPC mediates transport not just into the nucleus, but out of it, too. The number of pores per nucleus varies greatly; yeast cells have about 200, while frog eggs sport about 50 million. It is estimated that each pore mediates as many as ten import and ten export events per second, as proteins, nucleic acids, and the two complexed together go through the nucleus.

## Studies in transit

Researchers in the Blobel lab want to learn how the NPC is organized and how it functions. Their studies are a part of the lab's focus on protein targeting, the process by which newly synthesized proteins reach their proper destination within the cell. For that work, which has its roots in the research of George Palade, Philip Siekevitz and other pioneering Rockefeller cell biologists, Blobel won the Albert Lasker Basic Medical Research Award in 1993. Among other things, the award honored Blobel's discoveries about how proteins move, or translocate, into a cell's various membrane-bound organelles, such as the endoplasmic reticulum, the chloro-

plast, and the mitochondrion.

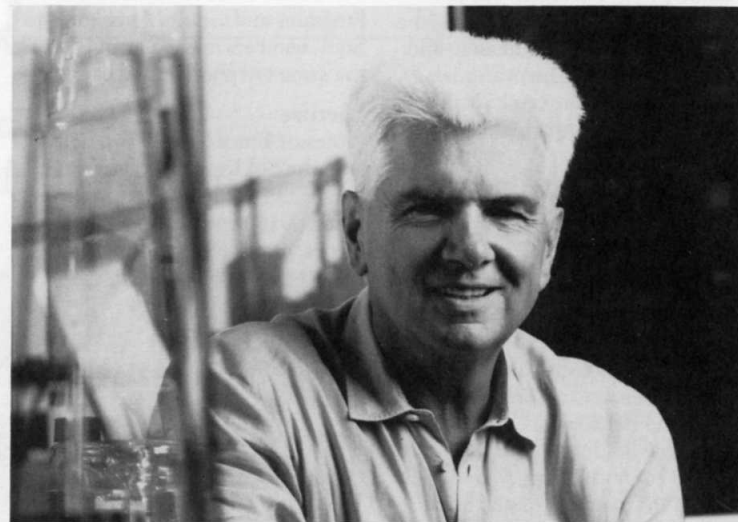
While the mechanisms underlying transport into those organelles have yielded their secrets over the years, until recently transport into the nucleus remained more of a mystery, due not just to the NPC's unusual complexity, but also to a lack of good assays with which to study the process. Thus, much of the initial research done in the Blobel lab and in labs elsewhere was "brute force" work to inventory some of the proteins, called nucleoporins, that constitute the NPC.

Such studies provided few clues about those proteins' functions, but recent breakthroughs have changed all that. "For the first time, we have been able to link the inventory approach with results from functional assays about how transport works. It's been a tremendously exciting experience," said Blobel.

## Exploring novel domains

The researchers' inventory taking was made easier in 1993, when research associate Mike Rout isolated the yeast NPC and made nucleoporins available for study in mass quantity. Work with both yeast and mammalian cells showed that some nucleoporins fall into families characterized by novel repeated-peptide motifs, suggestive of novel functions. Just what those functions might be became clearer through studies that looked at another class of proteins involved in nuclear import.

In 1990, Scripps Institute researchers Steve Adam and Larry Gerace (a former postdoc in the Blobel lab) had developed an assay showing that factors in the cytosol are required to import a substance through the nuclear pore. Following up on this research, in 1992 Mary Moore, then a research associate in the Blobel lab, found that two biochemical "fractions" of the cytosol were involved—Fraction A, required to accumulate the substance at the nuclear pore complex,



Professor Günter Blobel won the 1993 Albert Lasker Basic Medical Research Award for work on fundamental questions of protein transport within cells, work that continues in his lab today.

and Fraction B, essential for actual transport into the nucleus.

Characterizing Fraction B in 1993 and 1994, Moore found that it contains a protein called Ran and another protein, Ran-ip, that interacts with it. Extremely abundant within the cell, Ran had already been cloned, sequenced, and shown by other labs to be a GTP-binding protein. Such proteins cycle between an on and off state, and by so doing regulate many cellular processes.

## Decoding the system

Ran was "the Rosetta stone" of nuclear transport, Blobel said; once it was identified, "for the first time we had a function for a protein in the transport system." But work in the lab is now decoding more of the language of nuclear transport. For instance, in two papers published this year, Moore, research associate Aurelian Radu, and graduate fellow Junona Moroianu report that Fraction A contains a two-component protein complex they dubbed karyopherin. The alpha subunit of karyopherin links up with the "nuclear localization signal" found on all proteins destined for the nucleus, and also to karyopherin's beta subunit. The beta subunit binds not only to alpha, but also to certain peptide repeat regions on nucleoporins. Likewise, postdocs Jian Wu, Mike Matunis, Elias Coutavas, Doris Kraemer, and Mokoto Hijikata are showing that Ran and Ran-ip can also bind to sites on some nucleoporins.

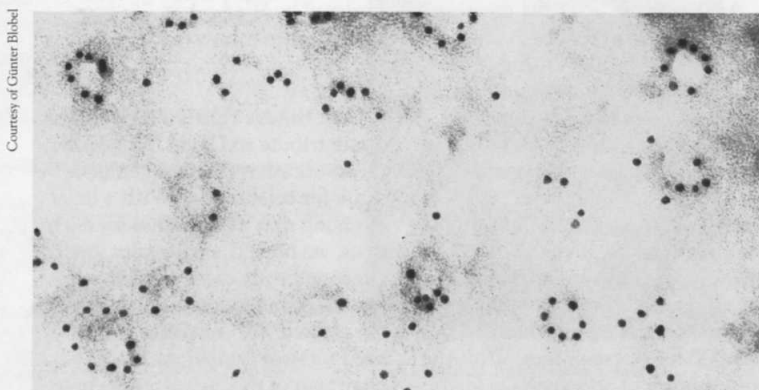
Said Blobel, "We still don't know exactly how all these proteins effect transport, but we have some ideas." One of their most intriguing ideas is that traffic both into and out of the nucleus works in essentially the same way—through a series of

docking and undocking events that ferry the molecule from one side of the nuclear envelope to the other.

On the cytosolic side, the action appears to start on the cytoplasmic filaments, nucleoporin proteins that snake out from the NPC surface. Complexes made up of the import substrate, alpha and beta karyopherin subunits, and Ran (and perhaps Ran-ip) might dock and undock sequentially to repeated-domain regions—first along the filaments, then through the opening of the NPC, and finally down another set of filaments that project into the nucleoplasm. The docking and undocking action might be controlled by Ran's on-and-off switch, which could direct the sequential disassembly and reassembly of the complex at each docking site on the way. The same general principles could hold for export from the nucleoplasmic side, with transport simply occurring in the opposite direction.

On-and-off-docking may not only get substances through the nuclear pore, but deeper within the nucleus, too. There, in 1992, former Blobel lab postdoc Mike Meier spied what appear to be molecular "tracks" that might be docking sites in interchromosomal regions. Blobel cautions, however, that "the nature of these structures is still completely obscure and must be biochemically defined."

That's just one of the many tantalizing puzzles about nuclear transport that remain to be solved. "Not only the details, but some of the major questions are still open for exploration," Blobel said. "That's what makes it all fun, sort of like a trip into the Wild West. You never know where you will find the next nugget."



Courtesy of Günter Blobel

Ran proteins—the black dots—encircle nuclear pore complexes (NPCs) in this electron micrograph of a nuclear membrane. Researchers in the Blobel lab have found that Ran binds components of NPCs.

## Potpourri

**Tri-Institutional Noon Recital**  
Pianist David Buechner will perform works by Bach and Busoni (the *Goldberg Variations*), Smetana, and Martinu at the Tri-Institutional Noon Recital today (Apr. 21). The concert, in Caspary at noon, is free.

### Friday film

*Blue* (France, 1993), directed by Krzysztof Kieslowski, will be shown today (Apr. 21) at 8:00 P.M. in Caspary Auditorium. The film is in French with English subtitles. Admission is free.

### Clinical Research Seminar

Daniel Weinstock, biomedical fellow in the Breslow lab, will discuss "The Role of Lipoprotein Lipase in Dietary Fat and Energy Metabolism: Studies in Induced Mutant Mice" at the Clinical Research Seminar Wed., Apr. 26 at noon in Nurses Residence 110B.

### Memorial service

A memorial service for John D. Wilson will be held Wed., Apr. 26 from 12:30 P.M. to 1:30 P.M. on the second floor of Welch Hall Library. Anyone who wishes to speak may do so; contact Pat Mackey, x8909 or e-mail mackey.

### Relocation

The Office of Research Administration has moved to Founder's Hall 301. The new office, located in

the Controller's Office, comprises the former offices of Sponsored Programs and Grants Accounting. Staff members may be reached at the same telephone numbers.

### Lecture

Professor Bruce S. McEwen delivered the Sol Kramer Lecture at Penn State University earlier this month. His topic was "Hormones, Genes, and the Brain: Linking Nature and Nurture."

### Searle scholar

Assistant Professor Ali Hemmati-Brivanlou has been named a 1995 Searle Scholar. The first Searle

Scholar at Rockefeller since the program was established in 1980 by the Chicago Community Trust, he studies inhibitory signals during embryonic development that lead to the induction of nerve cells.

### Honor

President Emeritus Frederick Seitz received the Order of the Brilliant Star with Violet Grand Cordon for his service on behalf of the advancement of science and technology in the Republic of China (Taiwan). President Lee Teng-Hui presented the award to Seitz in a ceremony Thurs., Apr. 6.

### Heintz lab babies

Jian Zuo, postdoctoral associate in the Heintz lab, and Tal Teitz, became parents to a son Daniel Teitz Zuo, 6 lb., Mar. 6.

Professor Nathaniel Heintz and Franca LaBella, research associate in the Heintz lab, became parents to daughter Chiara Barbara, 9 lb., 5 oz., Mar. 20.

### Equipment repairs

The Electronics Shop offers free estimates for repair of any laboratory equipment. For further information, contact Mike Perrino or Bjorn Gullaksen, x7897, or stop by Smith Hall C-13.

### Off Broadway

Michael Cook, a part-time assistant for research in the Lederberg lab, co-wrote songs for the off-Broadway production *The Lysistrata Affair*, now playing at the Judith Anderson Theater at 422 West 42nd Street until Sun., Apr. 30. Tickets are \$12 and can be reserved by calling 332-9735.

### Workshop

Computing Services is offering the following workshop:

**Word for Windows, I & II:** Mon., Apr. 24 and Mon., May 1, 2:00 to 4:00 P.M.

To register, contact Joan Falciano, x8925, or leave voice mail at x7768.

Leif Carlsson



Children and parents hopped to it during Rockefeller's annual Easter egg hunt. After the search, children ran traditional races and enjoyed chocolate and jellybean treats.

## Tributes to David Rockefeller include symposium, sculpture, and graduate student fund

(continued from page 1)

and visionary leadership.

### Alumni plan multifaceted reunion

A new alumni committee organized the scientific program that will take place a day after convocation. Entitled "Continuing the Commitment: Biomedical Research for the Benefit of Humankind," the program will begin with opening remarks by David Rockefeller and will include presentations by Barry Bloom, '63, Evelyn and Murray Weinstock Professor of Microbiology and investigator, Howard Hughes Medical Institute (HHMI), Albert Einstein College of Medicine; Marina Picciotto, '92, postdoctoral fellow, Institut Pasteur; Jeff Friedman, '86, associate professor, head of laboratory, and associate investigator, HHMI, Rockefeller; and M.R.C. Greenwood, '73, associate director for science, Office of Science and Technology Policy, Executive Office of the President. Joseph Goldstein, Paul T. Thomas Professor of Medicine and Genetics, University of Texas Medical

Center, and a Rockefeller trustee, will present the Friday lecture.

Other alumni activities planned are a reception and buffet supper, which will take place on the evening of convocation and, on the day of the symposium, lunch with graduate students and tours of laboratories. The symposium will be open to the campus community.

### Alumni create graduate study fund

Alumni are also creating a fund to endow "The David Rockefeller Fellowship for Graduate Study at The Rockefeller University."

"Having benefited from David Rockefeller's long-term interest in the graduate program, we can now in the same spirit help students who follow us," said fund organizers Bob Barlow, professor of Neuroscience and Ophthalmology at SUNY, Syracuse and SUNY Health Science Center, Syracuse and Miki Rifkin, associate professor at Mt. Sinai Medical School and associate director, Brookdale Center for Molecular Biology.

During the symposium, the first installment of alumni support will be presented to the university.

Alumni hope to build a total endowment of \$500,000; students would be nominated after completing their second year and would be selected for their promise as scientists and for their service and leadership at the university.

### Faculty Senate commissions bust of David Rockefeller

At the December 1994 meeting of the Academic Senate, members agreed that a fitting, lasting tribute to David Rockefeller would be to commission a bronze bust of him, to complement that of his father, John, and to be placed together with it in the lobby of the Rockefeller Research Building. Faculty members at the Senate meeting also recommended inviting all faculty members, current and emeriti, to create a fund of \$25,000 for the sculpture. With the consultation of art experts, a leading sculptor, William Crozier, has been commissioned to create the

## RSVP for convocation and regalia

A form for indicating participation in the academic procession, including information about ordering regalia, was recently mailed to faculty, post-doctoral fellows, and graduate students. Regalia for those who need it to march in the procession must be ordered by Wed., Apr. 26; contact Angie Dohnert, x8201.

work of art.

"We believe this is a most appropriate tribute to David Rockefeller, on an occasion that is a genuine cause for celebration. With a level of giving that makes sense for each of us, we hope that this very special effort will truly come from the entire Rockefeller community. We are pleased with response to date," said Professor Emil Gotschlich, chairman of the Academic Senate.

The sculpture is scheduled for completion before convocation.