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## NEWS AND NOTES 1992, VOL.2, NO.34

The Rockefeller University

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## New York State biotechnology tour holds seminar at Rockefeller

Business representatives from a dozen countries gathered at The Rockefeller University last week for a seminar on the biotechnology industry, the culmination of a three-day state-wide Biotechnology Familiarization Tour. The tour, co-sponsored by the Science and Technology Foundation and the State Department of Economic Development's International Division, was part of the "High Tech Global New York" campaign launched by Governor Mario Cuomo last month to promote New York as a center of high technology industry.

Rockefeller University's President Torsten Wiesel welcomed the participants, who came from places as far away as Brazil, China, Hong Kong, and Greece. Frank S. Casciani, former branch chief at the Food and Drug Administration (FDA), spoke about the current regulatory environment and how it affects companies entering the U.S. marketplace. Casciani presented a timetable for planning and implementing FDA strategies from clinical testing to market clearance.

Stanley Fink, former Speaker of the New York State Assembly and a partner in the law firm of Bower and Gardner, discussed when and how to approach the capital markets to maximize a new company's return. He emphasized the importance of securing solid financing and a good working relationship with those providing the initial investment. He said \$6 million seemed to be the "magic number" for financing new biotechnology companies this year.

Barbara Sawitsky, President of the Alpha Tauri Group, Ltd., a

management and technology consulting firm, concluded with a discussion on assessing the marketplace. She spoke about approaches to target markets and strategies for achieving a firm's objectives.

"Participants got a good look at why New York State is a growing center for the biotechnology industry," said Barbara Pilliod of the Science and Technology Foundation, who organized the tour with Sarah Demy of the State Department of Economic Development.

"Not only that," Demy added. "A lot of deals were discussed during the breaks."

## RU labs to host young physicians

A new program will be launched in The Rockefeller University Hospital this July. The Visiting Fellows in Clinical Investigation Program will bring three or four physicians, in their third year of post-graduate training, from The New York and Beth Israel Hospitals to work six months in one of The Rockefeller University Hospital's labs.

"These talented young physicians will have the opportunity to participate in the Hospital's research," said Jules Hirsch, the Hospital's physician-in-chief. "And they will bring with them the freshness and excitement of their recent medical training. I hope some of the fellows will return to Rockefeller later, as clinical scholars or junior faculty."

Hirsch also noted that the



Students of The Rockefeller University Children's School performed in "The Jungle Book" last week in Caspary Auditorium.

program will build ties with the university's neighboring institutions.

The Visiting Fellows in Clinical Investigation program is part of a drive to revitalize research at the Hospital and strengthen the milieu of clinical excellence. At a recent Hospital staff meeting where he announced the program, Hirsch commented: "My mission is to ensure that the Hospital is a vital, exciting place. As the first clinical research facility in this country, the Hospital is uniquely positioned to emerge at the vanguard of a new era in clinical research."

For more information about the Visiting Fellows in Clinical Investigation Program, contact Ted Rock, assistant administrator, x7511, or Hirsch, x8426.

## Production of 'The Jungle Book' roars to life

Dozens of excited children in elephant, monkey, and wolf costumes filed across campus from The Children's School to Caspary Auditorium early last Friday morning. They were going to perform in a production of "The Jungle Book," this year's Children's School play.

"The play is the last burst of energy for the school year," said Barbara Adams, director of the school. "Putting on a production gives the children something fresh to do in the spring. It also is a culmination of all the skills they developed throughout the year—painting murals, learning new songs, performing..."

The children sang, danced, and acted their way through the story. The class of three-year-olds played the wolf puppies, the class of three- and four-year-olds played the monkeys, and the class of four-year-olds played the elephants. The older children performed the lead roles.

Adams, who will retire as director of the Children's School this week, was presented with a gift before the production began.

"The parents and children gave me a beautiful album of children's drawings and notes from parents," Adams said. "It's a lovely, lovely gift. I want to thank everyone who contributed to it and everyone who made my years here so wonderful."



Frank S. Casciani, former branch chief at the Food and Drug Administration, Stanley Fink, former speaker of the New York State Assembly, and Barbara Sawitsky, president of The Alpha Tauri Group, Ltd. (from left to right) were speakers at a recent seminar on biotechnology held at Rockefeller.

2 Flowers spring to life around campus

3 Researchers reveal protein's structure

4 Children answer call for talent



## Daffodils, tulips, and azaleas spring to life around campus

The Rockefeller University campus has been compared to an oasis in the middle of a desert. This is especially true in the spring, when the trees spread their foliage and the flowers burst into bloom.

"Crocuses are the first to come out on campus in early March," said James Sullivan, supervisor of Grounds. "Then the daffodils and tulips come up and the azaleas begin to bloom. This year, everything was a little behind schedule because of the cold weather in April. Still, there aren't many places in New York with this kind of greenery."

The grounds crew recently replaced the tulips with begonias and impatiens—plants which will last through the summer to the first frost.

"Every year there is a lot of excitement on campus when we dig up the tulips," Sullivan said. "Since we don't have the space to store the bulbs to use next year, we give them away to anyone who wants to take them home."

Although the campus is most spectacular in the spring, keeping up the grounds is a year-round task.

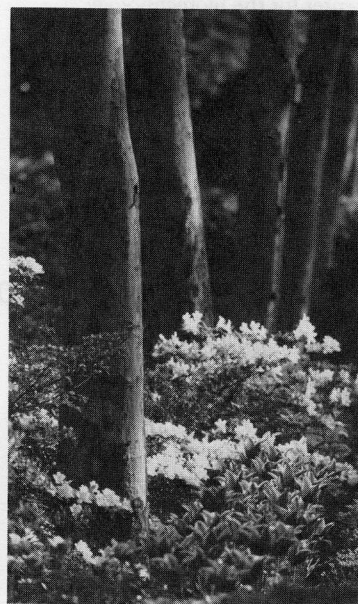
Shrubs need to be trimmed and replanted. The lawn must be raked, reseeded, fertilized, and cut. And trees require pruning and tending to make sure that deadwood does not become a hazard.

Sullivan uses his creativity when directing the replanting and trimming. "I like to let the shrubs grow out, especially in the back. It looks more natural and it's better for the plants. As for the color of the flowers, I like to break it up. It's nicer if they are not all the same."

While there was no major new planting this year, the crew did introduce some more ilex, an evergreen shrub, and viburnum, a flowering plant that tolerates shade well.

The four members of the grounds crew—Frank Duffy, Francisco Molina, Sullivan, and Eugene Tarasco—get a lot of compliments about their work at this time of year.

"Compliments are always nice," said Sullivan. "They give us a sense of accomplishment at the end of the day."



**Top:** The grounds crew digs up tulips to plant begonias and impatiens—plants which will last through the summer to the first frost. **Bottom left:** An array of flowers grace the base of a row of sycamore trees. **Bottom right:** Tulips bloom on campus.



A dogwood tree surrounded by a sea of tulips.

### Letter to the editor:

I noticed that an important category was missing from the article "28 ways to reach your audience" in the May 15 issue of *News&Notes*. The most up-to-date set of alumni addresses (in alphabetical or zip code order) is also available. The Dean's Office (a.k.a. Alumni Office) makes a universal update each summer after polling all of the alumni, and entering interim changes as they come into our office during the year. It is very possible that some offices in the university do not know that these label sets exist and they might be very useful.

Sincerely,  
Susanna Ander  
Admissions Administrator

*Editor's Note:* Requests for these and other labels should be placed with Jackie Mulero of Telecommunications Service, x7759.

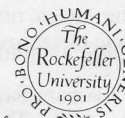
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# RU crystallographers 'peek into secrets of how nature works'

By Susan Blum

In biology, as in architecture, form often follows function. The proteins that labor within and between cells perform a myriad of tasks, including recognition, communication, catalysis, transport, and support. But whatever its particular job, a protein owes its success to its shape. Each one possesses a characteristic conformation of twists, pockets, and projections that endows it with exactly the right combination of chemical, mechanical, and electrostatic forces to get the job done. (One task of proteins is to interact with DNA, yet another type of molecule structurally suited to its job, that of storing genetic information.)

Many lines of scientific investigation yield intriguing clues to how a biological macromolecule may work. X-ray crystallography combined with computer imaging reveals the three-dimensional position of every atom within a molecule, thus providing scientists with profound insight into how the molecule functions as part of the cellular machinery.

## Technique reveals structure

Recent investigations conducted by Xiang-Peng Kong, a post-doc in John Kuriyan's lab, show just how powerful X-ray crystallography and computer imaging can be. The work, reported in the May 1 issue of *Cell*, reveals the structure of a protein crucial for chromosome duplication, one of life's most fundamental processes.

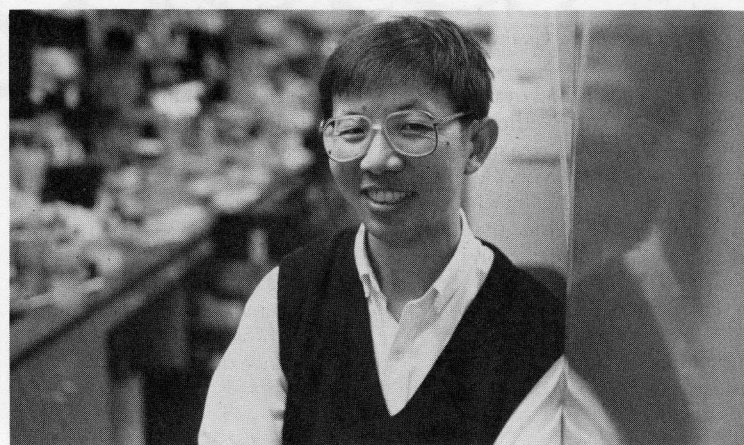
The molecule is the "beta

subunit" of DNA polymerase III (Pol III), an enzyme found in the *E. coli* bacterium. Pol III is actually a multi-component complex with a daunting task: to copy the millions of information units (base-pairs) that make up each chromosome. Like similar enzymes in higher organisms, Pol III must do its job in long sweeps, since short, on-again, off-again processing would take far too much time.

Researchers had known for some time that the beta-subunit conferred this stick-to-itiveness, or "processivity." The question was, how? Kong tackled the task of obtaining the beta-subunit's 3-D structure, and developing some hypotheses about how it might function. His work is part of a collaborative effort between the Kuriyan lab and the lab of Mike O'Donnell at Cornell University Medical College to understand the entire Pol III enzyme.

The O'Donnell lab has conducted extensive biochemical analysis of the beta-subunit, and provided large amounts of the purified protein. The next step was to grow crystals of the protein. For reasons that remain mysterious, growing crystals is a chancy business. Researchers can coax some proteins to crystallize in less than a day, but others they must fiddle and fuss with for years. "You have to be lucky," Kong says. Kong was; his crystals grew well and quickly.

The crystals were then bombarded with X-ray beams in diffraction experiments. The beams bounced off the electrons whirling around individual atoms within the crystal, and then scattered ("dif-



Recent investigations conducted by Xiang-Peng Kong, a post-doc in John Kuriyan's lab, reveal the structure of a protein crucial for chromosome duplication, one of life's most fundamental processes.

fracted") in all directions. Intercepted by a detector, the diffracted rays formed a pattern that could be interpreted by a computer.

## Exploring unknown terrain

This computer interpretation provided Kong with an electron-density map—a diagram of whirls and swirls resembling the contour maps hikers use to traverse unknown terrain. From then on, it was up to Kong to decipher the patterns and to build up—atom by atom—a 3-D model of the molecule as a whole.

The process draws on sophisticated computer modeling programs that allow scientists to rotate and otherwise manipulate the electron-density maps and other graphic models that emerge as the work progresses. But to interpret the maps and refine the models, investigators must draw on a wide range of knowledge. Among Rockefeller crystallographers, that expertise includes an unusual combination of biochemistry and theoretical chemistry.

## Working a complex puzzle

The aim of the sophisticated analysis is to identify individual atoms and groups of atoms, and to assess the possibilities of interactions among them. The process is like working an extraordinarily complex jigsaw puzzle, but with one major difference: there is no picture on the front of the box to guide the way. Rather, the picture emerges for the first time only as the pieces slowly begin to fall into place.

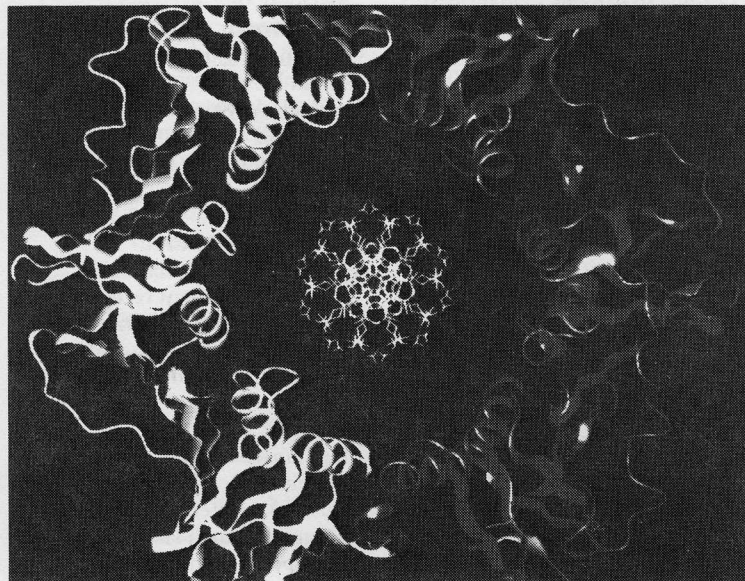
In the case of the beta-subunit, the *Cell* paper reports, the picture that emerged was of "a ring-shaped structure lined by twelve alpha helices that can encircle duplex DNA." In other words, says Kong, what he saw was "a doughnut." The doughnut is formed when two beta-

subunits join together to form what is known as a head-to-tail-dimer.

Biochemical experiments in the O'Donnell lab at Cornell had already indicated that the beta-subunit might act as a tight molecular clamp that tethers the polymerase core to the DNA, and moves along with the enzyme as it copies the chromosome. The structural characteristics Kong discovered—particularly the dimer's symmetry, the orientation of its helices, and the distribution of its positive and negative charges—confirm this view. They show how the doughnut can interact with DNA strongly but indirectly, rather than through direct bonds and other stabilizing interactions. Thus, the beta-subunit can confer processivity: it makes a clamp tight enough to hold on to DNA, but not so tight that it cannot easily slide along as the chromosome is progressively duplicated.

Kong—a former theoretical physicist who credits Kuriyan with teaching him all he knows about protein crystallography—says he is particularly pleased by the beautiful symmetry of the beta-subunit doughnut, since symmetry is a crucial concept in much of theoretical physics. But even the most asymmetric structures revealed by crystallography are strikingly beautiful, with their kinks, bends, and swirls tracing a slinky and colorful path across the computer monitors.

And that's just their visual beauty. Perhaps even more powerful is the intellectual beauty made manifest whenever the 3-D structure of a biological macromolecule is solved. For with that structure, Kong says, comes a deeper understanding of the fit between form and function, and the pleasure of being allowed to "peek into the secrets of how nature works."



This "ribbon cartoon" represents the 3-D crystal structure of the Pol III beta-subunit. The snowflake-shaped structure in the center represents DNA.



# Musicians and dancers—ages 3 to 15—answer call for talent

By Olivia Gushin

Melodies from Tchaikovsky's "Nutcracker" and Beethoven's "German Dance #1" emanated from Caspary Auditorium on the evening of May 18. It wasn't the Kirov—it was children, ages three to fifteen, from Scholars Residence and Faculty House.

"It became ridiculous carting kids all over the city for music and dance lessons," said Robin Raskin, organizer of this year's Seventh

Annual Women's Association Recital. "A few years ago we reached a critical mass in the number of kids taking lessons."

As teachers didn't have overhead costs teaching in the residences, it made more sense for them to come to the students. The Parents Group engaged several music teachers and Theresa Krueger, a ballet teacher, who gives classes twice a week.

Raskin puts out a call for talent six to eight weeks before the performance on the residence bulletin boards. Parents, teachers,

and students choose pieces together. Older music students usually play one piece, while younger ones play two short ones. The dance numbers this year were choreographed by Krueger and her students. Most of the three- and four-year-old dancers were performing before an audience for the first time.

Many people contribute to the production, noted Raskin. Some bring food for the reception. Others help put together the program, for example helping to Americanize the spelling of Japanese names.

"Because so many people are involved every year, the recital has become an institution," said Raskin. "The arts are something everyone can share—no matter what language they speak or where they come from."

"The recital is a good opportunity to show the little ones what the big ones are doing," she continued. "It's also a nice way for parents to share the moment."

The abundance of parents with video cameras at the performance seemed to agree.

## Potpourri

### Sweat Shirt Shop

The last time the Sweat Shirt Shop will open this academic year will be Tues., June 2, from 11:30 A.M. to 1:30 P.M. The shop will resume operation in September.

### Tri-Institutional Noon Recital

Violinist Miranda Cuckson and pianist Akira Eguchi will perform works by Debussy, Prokofiev, Kreisler, Paganini, and Tchaikovsky at Tri-Institutional Noon Recital today (May 29). Cuckson, a second-year student at The Juilliard School, has appeared as a soloist in Avery Fisher Hall, Alice Tully Hall, and The Juilliard Theater at Lincoln Center. Eguchi, who earned a Master's degree from The Juilliard School in 1990, has won Juilliard's William Schuman Prize for Outstanding Achievement and Leadership in Music, the Gina Bachauer Piano Scholarship, and

the William Petschek Debut Award. The recital, to be held in Caspary Auditorium at noon, is free and open to the Tri-Institutional community.

### Call for volunteers

Those interested in helping to prepare for graduation or in assisting in on-site activities on graduation day (June 18) should call Sandi Walsh, x8072, before June 3. The general meeting for convocation volunteers will be held in Caspary 1B, Tues., June 9, at 11:30 A.M.

### Software

ASP (A Statistical Package) version 2.0.1 is available from Computing Services. It is essentially the same as version 2.00 except a number of minor problems have been corrected. All those who picked up version 2.00 should

replace it with version 2.0.1 by bringing the diskette containing the older version to Smith Hall B7. Others who wish to pick up a copy of the software, which is free, should bring a blank diskette. For more information contact the consultant, x8940.

### SURF activities

Lab heads who wish to include undergraduates working in their labs for the summer in the activities of the Summer Undergraduate Research Fellow (SURF) program should notify Bonnie Platt of the Deans' Office, x8086.

### Plans

Professor David Baltimore, former president of The Rockefeller University, will become a professor in the Department of Biology at the Massachusetts Institute of Technology (MIT) in the spring of 1994. His lab will be situated in a building now under construction on the MIT campus. Baltimore will continue to work as a lab head at The Rockefeller University until that time.

### Honor

Professor Jan Breslow was recently elected to the Association of American Physicians. Also known as the "old Turks," this premier clinical society elects eminent scientists, practitioners, teachers, and clinical scientists to its membership.

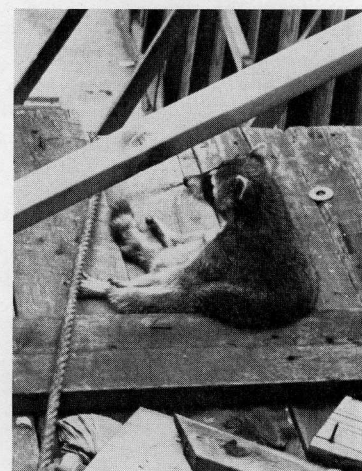
### Appointments

Guest Investigator: Fumio Tokuchi, Zabriskie lab

Postdoctoral Associates: Heike Endemann, Model lab; Lei Rong, M. Young lab

Postdoctoral Fellows: Lauren Brinster, Hayre lab; Miles Orchinik, McEwen lab; Vincent Pieribone, Greengard lab; Taku Takahashi, Chua lab; Zhengxin Wang, Roeder lab.

### Rocky Raccoon



A raccoon was stranded on the construction site of the new laboratory building Wednesday. The Security Department called the American Society for the Prevention of Cruelty to Animals for assistance.

### Departures

Guest Investigator: Helen Murray, Darnell lab

Research Associate: Urs Widmer, Cerami lab

Visiting Professor: Anatoly Severin, Tomasz lab.

### Volunteers honored

The Hospital's Recreational Therapy Department recently hosted a barbecue in honor of its volunteers. Volunteers and hospital staff attended the event.

### Discount

The Tamarind, a Thai restaurant at 1134 First Ave. (between 62nd and 63rd Sts.), is offering a 20 percent discount on lunch (not including lunch specials) and a 15 percent discount on dinner to those with Rockefeller University identification cards. Call 319-8159 to make reservations.



Parkash K. Cashmore, laboratory manager in Günter Blobel's Laboratory of Cell Biology, lost her three-year battle with cancer May 6. Cashmore joined The Rockefeller University in 1980 as research assistant in Philip Siekevitz's Laboratory for Cell Biology. She joined the Blobel lab in 1987 and worked there until her death.