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News and Notes 2000

The Rockefeller University News and Notes

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The Rockefeller University

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RU welcomed new neighbor Herbert Pardes of NYPH at Cohn forum lecture



Rockefeller University President Arnold J. Levine (left) with President and CEO of New York Presbyterian Hospital Herbert Pardes (right) at the the Mon., March 6, Cohn Forum. Photo by James Hughes.

On Mon., March 6, Herbert Pardes, the newly elected president and chief executive officer of New York Presbyterian Hospital, spoke at the Zanzvil A. Cohn Forum on Health Affairs. Introduced by RU Professor Mary Jeanne Kreek, Pardes spoke to a crowd in the Abby Aldrich Dining Room. His topic was "Toward a Sound Policy on Academic Medicine and Medical Research."

Pardes observed that while academic

medicine and clinical research are currently enjoying broad public and governmental support, clinical hospitals have been hard hit by reduced state budgets and public demands for lower health care costs. Pardes commented that much like a symphony which is only played well when all the instruments are top notch, so too must all areas of medical education and health care delivery receive equal attention and appropriate funding.

RU curious? Poster session introduces prospective students to university research



The Dean's Office invites the RU community to a poster session presenting current research by Rockefeller graduate fellows, postdocs and faculty. Today's session (March 10) is from 1 to 3:30 p.m. on the 17th floor of Weiss. All are welcome.

Presenters and prospective students alike enjoyed last week's poster session (Fri., March 3). Photos by Ann-Marie Blaber.

Roderick MacKinnon to discuss potassium channels in today's Friday lecture

Professor Roderick MacKinnon, head of the Laboratory of Molecular Neurobiology and Biophysics, will discuss "Potassium Channels" at today's Friday lecture (March 10).

MacKinnon's laboratory studies the molecular mechanisms of ion channels, membrane proteins that regulate the rapid and selective flow of inorganic ions into and out of cells. Shaped like tiny doughnuts floating in oil, ion channels perform the dual functions of gateway and gatekeeper. The holes in the doughnut form the gateway through which the ions flow. However, these holes, or pores, are endowed with special properties that enable different channel proteins to be selective as to which ions they allow passage.

The transfer of potassium ions across cell membranes has long been understood as an essential activity for many life-sustaining functions, such as the transmission of nerve impulses throughout the body and brain. But until MacKinnon's laboratory captured a three-dimensional image of the structure of a potassium ion channel protein, it was not well understood how the process actually worked.

In 1998, MacKinnon's laboratory solved the structure of the potassium ion channel, and the three-dimensional image of the channel was published on the cover of *Science* magazine, which chose the breakthrough as one of the ten biggest science stories of the year. On Sat., Sept. 25, 1999, MacKinnon was named a recipient of the 1999 Albert Lasker Basic Medical Research Award for this groundbreaking accomplishment.

MacKinnon's accomplishment is all the more unusual because he originally trained for a career in medicine, not research. He graduated from Brandeis University in 1978 with a bachelor of science degree in biochemistry. He went on to study medicine at Tufts University, securing his medical degree in 1982, and completing a residency at Beth Israel Hospital at Harvard Medical School. In 1986, however, he abandoned plans to practice medicine in order to pursue postdoctoral studies back at Brandeis in the laboratory of his undergraduate mentor, Christopher Miller. His scientific career, in effect, began at the age of 30.

In Miller's lab and then in his own at Harvard Medical School, MacKinnon sought to understand ion channels and the answer to two compelling questions: What do these channels look like? And how are they able to allow passage of potassium ions while blocking other ions that are similar?

Using electrophysical and biochemical approaches at Harvard, MacKinnon studied the interaction of the potassium channel with a specific toxin derived from scorpion venom and figured out that the toxin blocks the flow of ions by sitting directly on the pore of the channel. He then exploited the toxin to analyze the subunit structure, the moving gates and the ion conduction pathway of potassium channels.

Upon realizing he needed a better understanding of structural biology, MacKinnon



Professor Roderick MacKinnon will present today's Friday lecture. Photo by Arnold Adler. *in their file*

moved to Rockefeller University in 1996. At Rockefeller, MacKinnon learned X-ray crystallography, a skill he realized he would need in order to directly visualize a potassium channel in a way that previous experiments could not accomplish. This newly acquired proficiency led to the solving of the structure and the ensuing publication in *Science*.

Many questions about potassium channels remain unanswered. MacKinnon suspects that ions in the pore interact with one another through the structure of the protein, but establishing this will require higher-resolution data. The ability to actually look at ion channel structures has already begun to stimulate new directions in ion channel research. In 1999, his laboratory solved the structure of the channel's β subunit, which regulates when the channel opens and closes.

In addition to the Lasker Award, MacKinnon has received a number of scientific honors. He is a member of Alpha Omega Alpha Medical Honors Society, a PEW scholar in the Biomedical Sciences and the recipient of the McKnight Scholars Award, the Biophysical Society Young Investigator Award and the McKnight Investigator Award. Most recently, Brandeis University honored him with the 2000 Lewis S. Rosenstiel Award for Distinguished Work in the Basic Medical Sciences, which MacKinnon will receive in a ceremony on Thurs., April 6.

The lecture will take place in Caspary Auditorium at 3:45 p.m. and will be preceded by a tea in Abby Aldrich Rockefeller Lounge. All are welcome.

2 Running for a cure

3 Super-Nova

4 Calendar

In Memoriam

The RU community mourns the passing of Jane Roller Darnell, who died Thurs., March 2, from cancer at age 68. Jane Darnell was the wife of Professor James E. Darnell Jr. and the mother of Associate Professor Robert B. Darnell.

A graduate of Bryn Mawr, she was a painter in her 20s and 30s, and received the Boit Citation, a student award, from the Boston School of Fine Arts in 1963. She was the author of a popular vocabulary builder first published as *Euphonics Mnemonics* and later expanded as *Rhyme Your Way to a Powerful Vocabulary*. In 1982, she received a J.D. degree from the Cardozo School of Law. After serving as a member of the Corporation Council of New York (1982 to 1986) and Jones, Hirsch, Connors and Bull (1987 to 1991), she entered private practice in 1991.

In addition to her husband of 43 years and her son Robert, she is survived by sons Christopher M. Darnell and his wife, Julie; Jonathan R. Darnell; and Robert Darnell's wife, Jennifer Darnell, a postdoctoral fellow at RU; six grandchildren; and a brother, David Roller. In lieu of flowers, donations can be sent to the Jane Darnell Cancer Research Fund at Rockefeller University, 1230 York Ave., Box 259, New York, N.Y. 10021-6399. A concert in her memory will take place next Tues., March 14, in Caspary Auditorium at noon. A reception will follow in Abby Lounge. All are welcome.

Erling Blöndal Bengtsson to perform at next Peggy Rockefeller Concert



Cellist Erling Blöndal Bengtsson will perform at the Peggy Rockefeller concert on Wed., March 15. Photo courtesy of Maxim Gershunoff Attractions, Inc.

At age three, Erling Blöndal Bengtsson's father gave him a violin and his immediate instinct was to position it between his knees. However much his father protested, he could not be persuaded to hold it under his chin. Six months later, Bengtsson gave his first public recital on a viola equipped with an end pin. Thus began the career of cellist Bengtsson as a violist. At age 16, he was accepted at the

all-scholarship Curtis Institute of Music in Philadelphia, where he took up studies with Russian-born Gregor Piatigorsky. A year later he became Piatigorsky's instructing assistant at the Curtis Institute, and the year after that he succeeded Piatigorsky as a teacher at the Institute. Five years later he joined the Royal Danish Academy of Music in Copenhagen and was appointed professor at the age of 29. During the course of a career spanning four decades, Bengtsson has become a model for a whole family of young cellists playing in Denmark and abroad. He has served on the faculties of the leading musical conservatories of Copenhagen, Stockholm and Cologne. In

1990, he returned to the United States as a full professor at the School of Music at the University of Michigan in Ann Arbor.

A member of the Royal Swedish Academy of Music, Bengtsson is First Knight of the Danish Order of Danneborg and Commander of the Icelandic Order of Falcon.

Accompanying Bengtsson at the concert is pianist Doris Stevenson. Artist-in-Residence at Williams College, she divides her time between Williamstown and New York City where she is an active recitalist and chamber musician.

The recital on Wed., March 15 at 8 p.m. in Caspary Auditorium, will include works by Brahms, Bach, Fauré and Shostakovich.

Spring blooms at RU

The recent spring-like weather has begun to transform the RU campus into a budding paradise. While the unseasonably warm weather is a welcome change for most of us, campus horticulturalist Lulu Leibel is hoping for a return to cooler climes. She looks forward to the blossoms of the magnolia trees along York Ave. and explains that if the warm weather continues, the tree blossoms could be jeopardized in the event of an April frost. More proof that good things come to those who wait.



Crocuses bloom along the drive of the main entrance to campus, as seen on Tues., March 7. Photo by John Haubrich.

Potpourri

Theater tickets

Human Resources has a limited number of reduced price tickets for the following performances: Lauren Bacall and Rosemary Harris in Noel Coward's hit comedy "Waiting in the Wings" on Fri., March 10, at 8 p.m.; tickets are \$19.30 each. The Paul Taylor Dance Company at the Manhattan City Center on Sat., March 11, at 8 p.m.; tickets are \$16.30 each. Christopher Walken and Faith Prince in the hit musical production of James Joyce's "The Dead" on Thurs., March 16, at 8 p.m.; tickets are \$21.30 each. To reserve your tickets call Ron Kurtz, x8303.

Purchasing corner

Stock No.	Description
14170	Slide 75x25mm frost 1 gross
94900	Cover glass No. 1 circle 1oz/pk
14160	Slide tray card 20
83400	2" freezer Boxes 12/pk
83300	81 cell divider 12/pk
11380	Kodak Biomax MR-1 8x10
11370	Kodak Biomax MR-1 5x7
89265	Tip art 10ul w/try 21-236-3
89450	Tips combi plus 2.5ml 21381929
89460	Tips combi plus 5.0ml 21381330
89470	Tips combi plus 10ml 21-381331
89480	Tips combi bpur 2.5ml 21381404
89490	Tips combi bpur 5.0ml 21381405

92nd Street Y Lecture

The 92nd Street Y will present a panel discussion on the legacy of Marilyn Monroe in Caspary Auditorium on Tues., April 11. Panelists include authors Joyce Carol Oates and Dominick Dunne, columnist Liz Smith and film critic Molly Haskell. Tickets are \$20 and can be purchased at the 92nd Street Y's box office or through Y charge at 996-1100. A number of free tickets will be available for RU students. Call x8072.

Sweatshirt Shop reopens

The Sweatshirt Shop will reopen Tues., March 14 from 12 to 2 p.m.

1999 FSA deadline

Sat., April 15, 2000 is the 1999 Flexible Spending Account (FSA) reimbursement request deadline for dependent care and health care expenses. Please submit all 1999 FSA eligible expenses to 21st Century for reimbursement by this date. Any unclaimed balance after this date will be forfeited. FSA Reimbursement claim forms are located in Human Resources. If you have questions, call x8300.

Recent awards

Associate Professor Robert Darnell has been awarded the "Clinical Scientist Award in Translational Research" by the Burroughs Wellcome fund. This award provides \$750,00 over the course of five years to support the career development of physician-scientists whose work bridges the gap between basic research and patient care.

Professor Jeffrey Friedman has been awarded the Osborne and Mendel Award by the American Society for Nutritional Sciences. The \$2,500 award is given for outstanding basic research accomplishments in nutrition.

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Cellist Matt Haimovitz to play at today's Tri-Institutional Noon Recital

Today's Tri-Institutional Noon Recital will feature cellist Matt Haimovitz performing cello suites of Johann Sebastian Bach. The performance takes place at noon today (March 10) in Caspary Auditorium. Admission is free for members of the tri-institutional community and their guests.

Matt Haimovitz will perform cello suites of Johann Sebastian Bach at today's Noon Recital. Photo courtesy of the artist.



Get off the bench: Walk or run to fight women's cancers

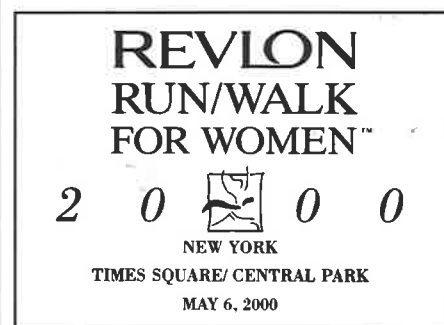
On Saturday morning, May 6, take off your lab coat and put on your running shoes to join RU friends and family in a run/walk against cancer. The third New York REVLON Run/Walk for Women™, sponsored by The Entertainment Industry Foundation and *The New York Times*, will begin in Times Square and finish in Central Park. If you are not up to the 5K run or walk, you can still make an important contribution by volunteering to staff the event or by sponsoring someone who is walking or running.

Among the treatment breakthroughs funded by the event is the new breast cancer therapy Herceptin, which is reported to increase the rate of survival in 30 percent of women diagnosed with breast cancer.

Funds raised by the New York run/walk also help fund local research institutes and screening/treatment programs such as the AMDeC Foundation. AMDeC uses the support it receives to run its Young Investigators Fund, a program that funds research that focuses on identifying the causes of breast and ovarian cancers, preventing the onset of these cancers, the early diagnosis of these diseases and finding less toxic treatments. Last year, two Rockefeller scientists received grants from AMDeC to support their cancer research.

Joining the fight against cancer is easy. RU is forming a team that is open to all—not just RU students and employees. As the event is untimed, you can enjoy the scenic route at your own pace, knowing that each step is making a difference in the fight against cancer. The entrance fee for the run/walk is \$20, and sponsor sheets are available for those who would like to raise additional funds. To join the Rockefeller team or to learn more about the event, call Jennifer Goldschlag, x8073.

Information about the event is also available at the REVLON Run/Walk for Women™ Web site: www.revlonrunwalk.com.



Now in its sixth year, the REVLON Run/Walk for Women began in Los Angeles. Due to the success it encountered on the West Coast, an East-Coast run/walk was introduced to New York City in 1988. Since its inception the annual event has helped raise \$17 million to support the research of cancers affecting women.

RU researchers identify protein that regulates RNA splicing in neurons

in his file

Darnell and Burley labs tackle problem from different directions

by Jim Stallard

Evolution has given higher organisms a genetic toolkit that is both flexible and precise. The two-step process by which genetic instructions are transformed into cellular actors—first from DNA to RNA (transcription) and then RNA to protein (translation)—allows for some critical improvisations.

A challenge these organisms face is correctly assembling the information contained in the RNA copy of the DNA. In this process, called RNA splicing, bits of RNA are snipped, and the surrounding genetic information is stitched back together to produce a correct template to encode a protein. In addition, a phenomenon called alternative splicing enables cells to generate two or more proteins from one identical gene, allowing a wide variety of metabolic tasks to be directed from the materials at hand. These genetic tricks are essential for the development and operation of complex nervous systems, such as those found in humans.

Now RU's Laboratory of Molecular Neuro-Oncology, headed by Associate Professor Robert Darnell, has identified a protein responsible for regulating RNA splicing in nerve cells. The protein, called Nova-1, is the first splicing factor specific to one kind of tissue to be found in mammals. The discovery that Nova-1 functions only in neurons suggests that the protein plays a key role in nervous system function. The research also sheds light on RNA alternative splicing in general.

Knowing a protein's biochemical activity is but one important part of understanding its function; the other crucial aspect is its shape. In addition to clarifying Nova-1's biological role, scientists in Darnell's lab, working with one of the Laboratories of Molecular Biophysics, have used X-ray crystallography to solve the structure of an essential segment of the protein bound to the RNA it regulates. Knowing the structure gives researchers a powerful way to predict other RNAs that are regulated by Nova. The combined research was reported in separate papers in the Feb. 4 issue of *Cell* and the Feb. 24 issue of *Neuron*.

Studying the protein through two scientific approaches illustrates the convergence of separate disciplines, a trend most experts agree will come to dominate research and which is already being demonstrated at Rockefeller through its extensive collaboration among laboratories. Increasingly, findings in one field are contributing to understanding in another domain and are helping shape the direction of research.

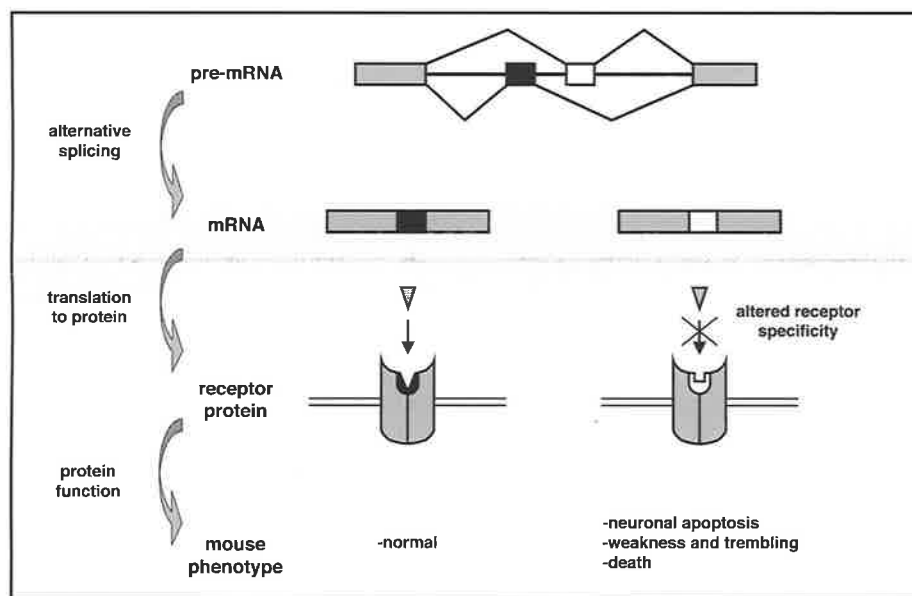
"This work gives us new insights into how RNA splicing is regulated in all mammals, including humans," says Darnell, whose lab conducted most of the work. "Until quite recently, it was thought that studying this kind of regulation in a mammalian system lay years in the future because the problem was too complex. But studying the disease antigen Nova has allowed us to link biochemistry and structure with *in vivo* biology. We've been able to approach the question from several directions."

The scientists first became interested in Nova-1 because the protein plays a key role in a rare disease called paraneoplastic opsoclonus myoclonus ataxia (POMA). Those suffering from POMA are unable to inhibit movement and suffer uncontrollable shaking. POMA is classified as a paraneoplastic neurological disorder

(PND), a type of disease studied by the Darnell lab. PNDs develop when cancer cells in the body prompt a tumor immune response that makes its way across the blood-brain barrier and disrupts the normal function of brain cells.

The brain is known as an "immune-privileged" site, meaning that proteins expressed only in the brain are not screened by the immune system as it goes through the process of learning which proteins are "self" and which are "foreign." When a brain protein is expressed in a tumor elsewhere in the body, the immune system sees it as a foreign protein and mounts a strong response against it. This immune response, while good for eliminating the tumor, sometimes makes its way into the brain where it can attack those neurons that express the protein. In the case of POMA, the protein is Nova-1.

The exact nature by which the immune system attacks the brain is unclear, but POMA patients have high levels of antibodies against Nova-1 in their spinal fluid. These same antibodies, it turns out, can bind a segment of Nova-1 called the KH domain and inhibit the domain's interaction with



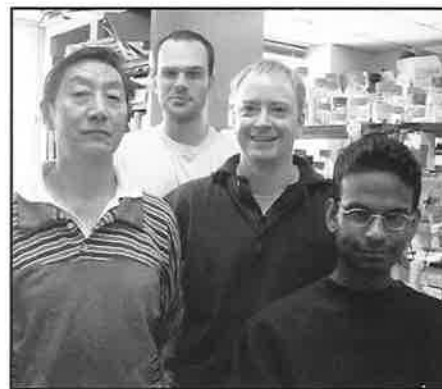
The Darnell lab found that the Nova-1 protein regulates RNA splicing in the nerve tissue of mammals. When the protein is present and performing its role, it directs alternative splicing of RNA, in which certain segments of pre-mRNA (top) are kept in the mRNA, while other segments are discarded during the transfer. Such cutting and stitching allows for translation to a wide diversity of proteins with very specific properties. If Nova-1 is absent, however, RNA splicing is deregulated, and the resulting protein's structure is changed. Darnell's lab hypothesizes that this altered receptor function directly contributes to nerve cell death. In a mouse model in which the gene encoding production of Nova-1 is deleted, the animal exhibits signs of severe neuronal dysfunction—including debilitating shaking and weakness. These symptoms are present in patients with POMA. Diagram by Kirk Jensen.

RNA. Researchers suspect that POMA patients' profound motor dysfunction is caused at least in part by a direct inhibition of RNA binding by Nova-1 antibodies.

Nova's function

Darnell's laboratory set out to understand Nova-1's function, and they focused on the protein's three KH domains; the parts thought to bind RNA. Using a technology known as SELEX, Darnell and his colleagues were able to determine that Nova prefers to bind RNA stretches that contain repeats of the nucleic acid sequence UCAY. (Nucleic acids are the building blocks of DNA and RNA.) Upon learning this, the scientists searched RNA databases for repeats of UCAY and zeroed in on a sequence found in a molecule called the inhibitory glycine receptor, which contains several UCAY repeats. The researchers hypothesized that Nova-1 was acting through this sequence in the glycine receptor to control alternative splicing.

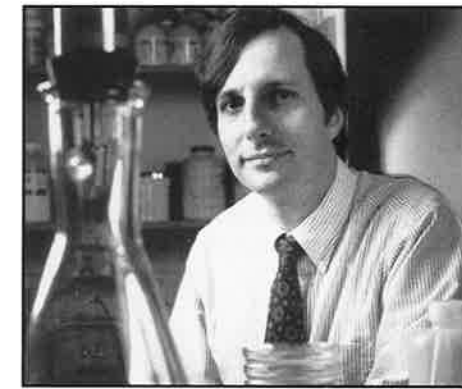
Alternative splicing is a phenomenon that enables cells to produce a wide variety of proteins from a finite number of genes.



Members of the Laboratory of Neuro-Oncology, headed by Robert Darnell (pictured at right), and one of the Laboratories of Molecular Biophysics, headed by Stephen K. Burley, used cell cultures, animal models and X-ray crystallography to piece together the essential details of the Nova protein's function and structure. Pictured in the photo at left are: Ru Zhong, Giovanni Stefani, Kirk Jensen (Darnell Lab) and Kiran Musunuru (Darnell and Burley Labs). Co-authors not pictured: Kate Dredge, Ron Buckanovich, James Okano and Yolanda Yang (Darnell Lab) and Hal Lewis, Carmen Edo and Hua Chen (Burley Lab). Photos by Linne Ha (left) and Robert Reichert (right).

The initial transcript of any gene, known as pre-mRNA, is pieced together to produce a mature mRNA that can code for a protein. In alternative splicing, different pieces of this pre-mRNA are stitched together to produce different mRNAs, and thus different proteins.

To test their theory that Nova-1 regulates glycine receptor alternative splicing, Kirk Jensen, first author and a postdoctoral fellow in the Darnell lab, and his collaborators carried out two lines of studies—one in cell cultures, the other in animals. In cell cultures, they demonstrated that Nova-1 could control the alternative splicing of a glycine receptor



Stephen K. Burley, to determine the co-crystal structure of Nova and the RNA that it targets to regulate alternative splicing.

"We had some pretty solid evidence that Nova regulates alternative splicing of the glycine receptor by binding the UCAY repeats," says Kiran Musunuru, a biomedical fellow in the Darnell and Burley laboratories. "So we wanted to see the molecular mechanism by which the Nova KH domain interacted with UCAY and understand why Nova recognizes that sequence instead of others."

What they found was surprising. Most proteins that bind with RNA do so along one of two surface areas on the protein, the α helix or the β sheet, because they offer favorable conditions for connection. The KH domain of Nova, however, uses a different method. Every KH domain contains two loops: an "invariant loop" that is the same in all domains, and another "variant loop" with differing lengths. The Nova KH domain uses these two loops as a molecular vise that holds the RNA strand in place on a platform between them. The platform is made up of amino acids projecting from two helices and one of the β strands. Since the three amino acids lack affinity for water, the researchers have dubbed it the "hydrophobic platform."

Such a structure, which binds using two loops and a hydrophobic platform rather than the α helix or β sheet, has never before been reported. "For those of us familiar with protein structures, this is quite a novel way for a protein to hold an RNA strand in place," says first author Hal Lewis, former postdoc in Burley lab.

The interdisciplinary research environment at Rockefeller allowed scientists from two different labs to piece together the protein's vital information, says Burley, the Richard M. and Isabel P. Furlaud Professor, who also serves as Rockefeller's deputy for Academic Affairs. "This research has been unusual in that it's extended into a lot of different scientific domains," he says, "With two labs working different angles, we were able to get a more complete picture of how Nova normally works and what is happening when it doesn't."

In addition to Darnell and Jensen, co-authors of the *Neuron* paper are graduate fellows Kate Dredge, Giovanni Stefani, Ru Zhong, Ron Buckanovich, James Okano and Yolanda Yang. The research reported in *Neuron* was supported in part by the National Institutes of Health, an Irma T. Hirsch Career Scientist Award, the Breast Cancer Research Program and the Ataxia Telangectasia Children's Project.

In addition to Burley, Darnell, Musunuru, Lewis and Jensen, co-authors of the *Cell* paper are Carmen Edo and Hua Chen. The research reported in *Cell* was supported in part by The Rockefeller University, the National Institutes of Health and the Breast Cancer Research Program.

Nova's KH domain structure

In addition to deducing Nova's function, Rockefeller researchers also wanted to find out exactly how Nova and its targets are put together. Darnell's laboratory collaborated with one of the Laboratories of Molecular Biophysics, headed by Rockefeller Professor and Howard Hughes Medical Investigator

<http://www.rockefeller.edu/rucal>

THE ROCKEFELLER UNIVERSITY—Please post

FRIDAY, MARCH 10

12:00 p.m. **NK receptors for HLA class I molecules.** Bo Dupont, Professor, Immunology Program; Member, MSKCC. Immunology Seminar. **117 Whitney, WMCCU, 1300 York Ave.** Contact *Michele Lavarde, 212-746-6452.*

12:00 p.m. **The EGF-CFC Gene Family and Axis Formation in the Mouse Embryo.** Michael Shen, Assistant Professor, UMDNJ—New Jersey Medical School; Resident Member, Center for Advanced Biotechnology and Medicine. Molecular Biology Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.** Refreshments at 11:45 a.m.

7:00 p.m. **Psoriasis Support Group.** Patricia Gilleaudeau, Research Nurse, RU. Psoriasis Support Group Meeting. **110B Nurses Residence.** Contact *Patricia Gilleaudeau, 327-8333.*

MONDAY, MARCH 13

10:00 a.m. **Membranolytic Active Peptides—Forms and Functions.** James P. Tam, Professor of Microbiology and Immunology and of Biochemistry, Vanderbilt U. Seminar. **302 Weiss.** Contact *Nam-Hai Chua, 327-8126.* Open to RU community and guests.

12:00 p.m. **Enhancer-Promoter Crosstalk by Globin Genes in Chromatin.** Ann Dean, Senior Investigator, Laboratory of Cellular and Developmental Biology, NIDDK, NIH. Molecular Biology Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.** Refreshments at 11:45 a.m.

12:00 p.m. **Presentation of Simian Immodeficiency Virus by Dendritic Cells: Immune Activation versus Virus Replication.** Melissa Pope, Assistant Professor, RU. CFAR Seminar. **Sixth Floor Conference Room, ADARC, 455 First Ave.**

12:30 p.m. **Interleukin 10 and Its Receptor.** Kevin Moore, DNAX Research Institute, Palo Alto, Calif. Immunology Lecture. **Second Floor Conference Room, HSS, 535 East 70th St.**

4:00 p.m. **The Frizzled Pathway, Tissue Polarity and the Control of Cellular Morphogenesis in *Drosophila*.** Paul Adler, Professor of Biology, U. of Va. Cell Biology and Genetics Seminar. **Weill Auditorium, WMCCU, 1300 York Ave.**

5:00 p.m. **Stopping the Cell Cycle, a Role for p27 in Differentiation and Tumorigenesis.** Andrew Koff, Associate Member, Molecular Biology Program, Frederick R. Adler Chair for Junior Faculty, MSKCC. Pathology Seminar. **117 Whitney, WMCCU, 1300 York Ave.**

TUESDAY, MARCH 14

11:00 a.m. **Unnatural Substrate-based Cellular Engineering and Evolution: Applications to Cancer and Glycosylation Disorders.** Kevin Yarema, Assistant Specialist, Dept. of Chemistry, UC Berkeley. Pels Family Center for Biochemistry and Structural Biology Seminar. **305 Weiss.** Contact *Bobbie Larraga, 327-7240.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

11:00 a.m. **Using Zebrafish to Explore the Genetic Basis of Vertebrate Neural Development and Behavior.** Su Guo, Dept. of Neuroscience, Genentech Inc. Developmental Biology Seminar. **301 Weiss.** Contact *Bobbie Larraga, 327-7240.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

4:00 p.m. **Biochemical Analysis of Nuclear Hormone Receptor Signaling Pathways.** William Lee Kraus, Assistant Professor of Biochemistry and Molecular Biology, Dept. of Molecular Biology and Genetics, Cornell U. Pharmacology Seminar. **Weill Auditorium, WMCCU, 1300 York Ave.** Coffee at 3:45 p.m. Contact *Virginia Ramos, 746-6250.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

4:00 p.m. **Biomimetic Carpentry of Self-assembling Functional Protein Nanostructures.** Edward Goldberg, Professor, Tufts U. Center for Studies in Physics and Biology Seminar. **B Level Conference Room, Smith Hall Annex.** Tea at 3:30 p.m. Contact *Martin Zapotocky, 327-8835.*

WEDNESDAY, MARCH 15

11:00 a.m. **Higher Bandwidths through the Bottleneck: Semi-Automated Approaches to the Interpretation of Gene Expression Profiles.** Mark Boguski, Senior Investigator, Computational Biology Branch, National Center for Biotechnology Information, Bethesda, Md. Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.**

12:00 p.m. **Autoimmunity—Molecular Impressionism.** Antony Rosen, Johns Hopkins U. Seminars in Clinical Research. **110B Nurses Residence.**

1:10 p.m. **Molecular and Cellular Adaptations after Cocaine Administration.** Rene Hen, Columbia U.; Eric Nestler, Yale U. Biological Correlates of Cocaine Abuse Program. **Room 611 HW, West Building, Hunter College, 68th St. and Lexington Ave.** Reception at 12:45 p.m.

3:00 p.m. **TGF- β /SMAD Signaling.** Joan Massagué, Professor, MSKCC. Student-Sponsored Seminar. **301 Weiss.** Refreshments at 4:00 p.m. in Weiss 17th floor. Open to RU/WMCCU/NYPH/MSKCC community and guests.

4:30 p.m. **Radioimmunotherapy for Leptomeningeal Disease.** Kim Kramer, Instructor in Pediatrics, MSKCC. Neurooncology Neuroscience Conference. **Hoffmann Auditorium, MSKCC, 1275 York Ave.** Refreshments at 4:15 p.m. Contact *Vivan Tabar, 639-8556.*

5:00 p.m. **Mammalian Cloning, a Progress Report.** Jose Cibelli, Vice-President Research, Advanced Cell Technologies. Seminar. **301 Weiss.** Contact *Peter Mombaerts, 327-7300.*

THURSDAY, MARCH 16

11:00 a.m. **Control of Cell Division and Growth in the Developing *Drosophila* Wing.** Laura A. Johnston, Division of Basic Sciences, Fred Hutchinson Cancer Research Center. Developmental Biology Seminar. **301 Weiss.** Contact *Bobbie Larraga, 327-7240.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

12:00 p.m. **Does Estrogen Make the Man?** Charles E. Roselli, Associate Professor, Dept. of Physiology and Pharmacology, Oregon Health Sciences U., Portland. Endocrinology and Reproductive Biology Seminar. **Weiss 17th Floor, Northeast Dining Room.**

2:00 p.m. **Structural Basis for Histone Acetylation by the GCN5 and P/CAF Transcriptional Coactivators.** Ronen Marmorstein, Associate Professor, The Wistar Institute, U. of Penna. Pels Family Center for Biochemistry and Structural Biology Seminar. **301 Weiss.** Contact *Bobbie Larraga, 327-7240.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

3:00 p.m. **Neuroimaging of Frontal Lobe Function.** John Duncan, Research Staff, Attention Group, MRC Brain and Cognition Unit, Cambridge, UK. Systems Neuroscience Seminar. **305 Weiss.**

4:00 p.m. **Activation of Encrypted Tissue Factor Triggers the Coagulation Cascade.** Ronald Bach, Associate Professor, Dept. of Medicine, U. of Minn. LFKRI Research Seminar. **Lower Level Conference Room, New York Blood Center, 310 East 67th St.** Tea at 3:45 p.m.

5:00 p.m. **The Legacy of Dolly: Biomedical and Research Applications of Nuclear Transfer.** Alan Colman, Director of Research, PPL Therapeutics. Seminar. **302 Weiss.** Contact *Peter Mombaerts, 327-7300.*

8:00 p.m. **Sex and Death in a Nematode.** Barbara J. Meyer, Professor, Molecular and Cell Biology, UC Berkeley; Investigator, HHMI. Harvey Society Lecture. **Casparly Auditorium.**

MONDAY, MARCH 20

12:00 p.m. **Post-Transcriptional Regulation of Retroviral Gene Expression.** Bryan R. Cullen, Duke U. Medical Center. CFAR Seminar. **Sixth Floor Conference Room, ADARC, 455 First Ave.**

4:30 p.m. **EDG Receptor Signaling: Evaluation in Heterologous Systems.** David R. Manning, Professor, Dept. of Pharmacology, U. of Penna. PBMM Research Seminar. **Weill Auditorium, WMCCU, 1300 York Ave.** Coffee at 4:15 p.m.

5:00 p.m. **Vascular Endothelium: Analysis of Its Transcriptional Programs in Health & Disease.** Michael A. Gimbrone Jr., Elsie T. Friedman Professor of Pathology, Harvard Medical School; Director, Center for Excellence in Vascular Biology, Brigham & Women's Hospital. Pathology Seminar. **C-405 WMCCU, 1300 York Ave.** Contact *William A. Muller, 746-6487.*

WEDNESDAY, MARCH 22

8:00 a.m. **Winter Biotech Product Show.** Jeff Fagan, Sales Representative, Amersham Pharmacia. Demonstration. **Weiss 17th Floor.** Contact *Jeff Fagan, 800-526-3593x5615.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

10:30 a.m. **Biostatistics Course.** Biostatistics Course. **128 Hospital.** Contact *Knut Witkowski, 327-7175.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

12:00 p.m. **Emerging Frontiers in Cardiovascular Nutrition.** Penny Kris-Etherton, Penn State U. Seminars in Clinical Research. **110B Nurses Residence.**

7:15 p.m. **Solution Structure of DNA Oligonucleotides: Comparing Simulation with Experiment.** David Beveridge, Professor, Wesleyan U. New York Structural Biology Group. **Casparly Auditorium.** Contact *Anne Roche, 327-8836.* Reception in Faculty and Students Club at 8:45 p.m. Open to RU/WMCCU/NYPH/MSKCC community and guests.

THURSDAY, MARCH 23

12:00 p.m. **Non-Classical Mechanisms in the Control Of Steroidogenesis.** Brian A. Cooke, Professor, Department of Biochemistry and Molecular Biology, University College, London, UK. Endocrinology and Reproductive Biology Seminar. **301 Weiss.**

THE ROCKEFELLER UNIVERSITY
Friday Lectures & Thesis Presentations

These events are held in Casparly Auditorium at 3:45 p.m. Tea is served in Abby Aldrich Rockefeller Lounge at 3:15 p.m. All are welcome.

FRIDAY, MARCH 10
Potassium Channels. Rod MacKinnon, Professor, RU; Investigator, HHMI.

MONDAY, MARCH 13
Thesis Presentation: A Close Look at the Strong Coupling Constant. Christina Mesropian, Graduate Fellow, RU.

TUESDAY, MARCH 14
Thesis Presentation: Learning to See: Experience and Attention in Primary Visual Cortex. Roy Crist, Graduate Fellow, RU.

THURSDAY, MARCH 16
Thesis Presentation: Initiating Eukaryotic Translation from the Beginning and Middle. Joseph Marcotrigiano, Graduate Fellow, RU.

FRIDAY, MARCH 17
HIV Entry and Its Inhibition. Peter Kim, Professor, Dept. of Biology, The Whitehead Institute, MIT; Investigator, HHMI

MONDAY, MARCH 20
Thesis Presentation: Regulation of Amyloid Protein Precursor Processing, Trafficking and Function by FE65, an APP-binding Protein. Shasta Sabo, Graduate Fellow, RU.

2:00 p.m. **Gene Regulation Using Engineered Zinc Finger Transcription Factors.** Yen Choo, MRC Laboratory of Molecular Biology, Cambridge UK. Gene Regulation Seminar. **305 Weiss.** Contact *Katie Schaefer, 327-8259.*

The Arts and Other Events

FRIDAY, MARCH 10
12:00 p.m. **Tri-Institutional Noon Recitals.** Matt Haimovitz, cello. Performing cello suites of Johann Sebastian Bach. **Casparly Auditorium.** Contact *John Gerlach, 327-7776.* Open to RU/WMCCU/NYPH/MSKCC community and guests.

WEDNESDAY, MARCH 15
8:00 p.m. **Peggy Rockefeller Concerts.** Erling Blöndal Bengtsson, cello, and Doris Stevenson, piano. Performing works by Brahms, Bach, Fauré and Shostakovich. **Casparly Auditorium.** Contact *Cathy Rogers, 327-8437.*

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