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news&notes

FEBUARY 11, 2000 VOLUME 21, NUMBER 16 THE ROCKEFELLER UNIVERSITY

Roeder awarded Horwitz Prize for untangling transcription

One of the most fundamental processes in biology is the way in which genetic information encoded in DNA is converted into proteins, a process called gene expression. At different times in the life of a cell, different genes are expressed, directing the synthesis of proteins in particular sequences and groupings. Just as musical instruments playing in programmed combinations can produce a symphony, gene expression is orchestrated.

The result for the cell can be its orchestrated development into a liver, heart, or skin cell, for example, or the decision to grow or to divide, or to interact with other cells to form tissues in the body. And when gene expression goes awry, a cell may turn cancerous.

The first step in gene expression is transcription—the switching on of a gene. DNA provides a sort of musical score, but what functions as the maestro, telling a gene to begin performing?

During the last 30 years, RU Professor Robert Roeder has answered this question with seminal contributions, and he provided much of the information that scientists know about the transcription process in animal cells. Last Thursday (Feb. 3), Roeder was recognized for his profound impact on science with the Louisa Gross Horwitz Prize from Columbia University. The prize, which Roeder shares with Robert Tjian of the Howard Hughes Medical Institute at the University of California at Berkeley and Pierre Chambon of the Université Louis Pasteur and the College de France, honors scientists for "outstanding basic research in biology or biochemistry."

Professor Robert Roeder receives the Louisa Gross Horwitz Prize from Columbia University President George Rupp last Thursday (Feb. 3). The Horwitz Prize has become informally known as a Nobel Prize "predictor," with nearly half of its recipients going on to win the Swedish prize since 1967. President Arnold Levine received last year's Horwitz Prize. *Photo courtesy of Columbia University.*

While he has shared many prizes with Tjian in recent years—most notably last year's Sloan Prize from the General Motors Cancer Research Foundation—Roeder's work laid the foundation upon which discoveries by Tjian, Chambon and others were made.

Current research in the Roeder lab includes elucidating how transcription factors are activated. Some of these proteins orchestrate cells that mount the body's defense against foreign invaders. Other factors flip the switch that keeps cell division in check—or causes tumors when it malfunctions. By demonstrating how the function of key factors is altered, Roeder's lab may help clarify the reasons for various growth and developmental abnormalities. Ultimately, it may lead researchers to control these processes—and repair their pathological consequences.

"As we become familiar with the fundamentals of how genes work, we get closer to understanding diseases like cancer, or viral infections like HIV," says Roeder, the university's Arnold and Mabel Beckman Professor and head of the Laboratory of Biochemistry and Molecular Biology.

Roeder's pioneering studies began when he was a graduate student at the University of Washington in the late 1960s.

"My career started in the early days of understanding what vertebrate genes were and how they function," Roeder says. "I first became interested in gene activation because this process is at the center of cell growth and differentiation."

Gene activation, the process of transcription, involves making an RNA copy of the gene from the DNA template. Constructing this copy requires enzymes known as nuclear RNA polymerases, which Roeder discovered while working in the laboratory of William J. Rutter. In a landmark paper published in 1969, he identified three polymerases, which he designated I, II and III, responsible for "reading out" DNA and synthesizing the three different types of RNA. Roeder also found three distinct groups of protein complexes, called accessory factors, that are essential for the individual RNA polymerases to recognize and copy particular classes of genes.

Roeder was also the first to identify the general factors—proteins common to the transcription process for any gene—for a number of different classes of genes, including class II genes, the ones that code for proteins in animal cells. The general factor called TFIID is a key member of this group, because it is the first to bind to the DNA control element called the TATA box, a short section of DNA that

see **Untangling transcription**, page 3

Friday lecture: Comparative protein structure modeling

Andrej Šali, RU assistant professor and Alfred P. Sloan research fellow, will present today's Friday lecture.
Photo by Robert Reichert.

Andrej Šali, assistant professor, Alfred P. Sloan research fellow and Sinsheimer scholar, will present today's Friday lecture (Feb. 11). The topic of his talk will be "Comparative Protein Structure Modeling of Genes and Genomes."

Šali's lab designs methods to theoretically predict three-dimensional structures of proteins. At the core of all the research done in Šali's lab is comparative modeling. Comparative modeling uses known protein structures determined by experimental methods, such as X-ray crystallography and nuclear magnetic resonance (NMR) spectroscopy, to extrapolate the structure of other proteins. Šali designed the software program MODELLER to aid in this process.

Building on the theory that proteins with similar sequences have similar structures, MODELLER allows scientists to take advantage of current knowledge and obtain new protein structures. The program compares the amino acid sequence of a protein with an unknown structure (referred to as the target) to a protein with a known structure that has a similar amino acid sequence (the template). The procedure consists of four steps. The first step is to identify the template. Next, the sequences of the template and the target are aligned. From this alignment a three-dimensional model is built. Finally, the model is assessed using computational and experimental methods. MODELLER is currently used in over 1,000 academic labs as well as by many pharmaceutical companies.

There are a multitude of puzzles and challenges that comparative modeling can help master. Šali, who heads the Laboratory of Molecular Biophysics, collaborates with other labs at RU and elsewhere that are seeking to learn more about a particular protein. He also works on modeling proteins on a large scale and is helping to build the infrastructure for the fields of structural and functional genomics.

In today's lecture, Šali will focus on how comparative modeling can help model proteins from the massive amounts of data generated by genome sequencing projects. Thanks to initiatives such as the Human Genome Project, scientists now have data for thousands of gene sequences, as well as whole genomes of various organisms. However, in order for this data to have biological as well as clinical relevance, the functions of the proteins produced by the gene sequences must be understood.

Since the way a molecule behaves is largely determined by the intricacies of its three-dimensional shape, determining the structures of the proteins identified in genomics will help elucidate what the functions of the proteins are and how abnormalities in proteins can cause disease. This emerging field is commonly referred to as structural genomics.

The future impact that structural genomics will have on biology and medical practice promises to be staggering. With a deeper understanding of protein structures and their functions,

see **Friday lecture**, page 2

President Emeritus Joshua Lederberg was at the Elysée Palace in Paris last week to sign the Charter of Paris written by the World Summit Against Cancer. The charter underscores the commitment of its signers to ensure the humanitarian treatment and equal partnership of people with cancer, create optimal research environments, accelerate the development and application of proven and emerging technologies, address the global burden of cancer, and design anti-cancer strategies to meet local needs.
Photo courtesy of Joshua Lederburg.

RU on-line directory puts communication at your fingertips

by Allison Hastings

The Rockefeller University directory is now available on the RU Web site. Featuring all the benefits of the printed directory, the Web-based version also makes it possible to generate e-mail lists and mailing labels with the click of a button. If you want to send a message to everyone in the Public Affairs Office, for instance, or make labels for all lab heads, you can now do so quickly and efficiently. In addition, the Web-based directory is updated regularly.

"With the new system, it is now possible to have real-time updates. Changes are immediately accessible," says Anne Duffy, assistant director of Computing Services. And of course, the directory gives easy access to the campus box numbers, office locations, staff titles, and phone, fax and e-mail information of all faculty, administrative staff, research personnel and students. According to Duffy, most of the new features available on the Web directory were created in response to numerous users' requests. Computing Services welcomes your feedback for future refinements and improvements.

Most of the functions of the online directory are available only to RU faculty, students and staff. For security reasons, users outside of the university can only search by name to find an e-mail address or phone number.

To use the directory, just visit the RU home page at http://www.rockefeller.edu and click on the phone icon. This will bring you to a search screen with a variety of menu options. From here, you can:

- search the RU directory;
- create e-mail lists and mailing labels;
- sort e-mail lists by faculty, postdocs or students; and
- access RU emergency policies, the yellow pages and dialing instructions.

The "Build E-mail lists" and "Build labels" functions are the most innovative features of the electronic directory. These functions allow you to build lists and create labels for a variety of specific groups on campus. Pre-defined lists and mailing categories (such as title, department, building and floor) make it possible for you to send e-mail to everyone in a given area. You can also limit your list by "de-selecting" individual names.

Rimma Belenkaya, left, and Anne Duffy were part of the team that helped develop RU's Web-based directory. *Photo by Linne Ha.*

For example, if you wanted to send an e-mail message to all graduate fellows at the university, you would simply select "Students" from the mailing categories. Then, you will be asked to confirm your selection. From there, a list of all fellows appears that you can view and modify if you choose.

Once you have built the list, you have the option of sending either individualized mail or group mail. By selecting "Individual Messages," each recipient will receive a message addressed to him or her specifically. "Group Message" sends the e-mail to all recipients without an individualized form of address.

The label-making function of the directory allows you to build and modify lists in the same way that the e-mail portion does. If someone doesn't have an e-mail address, you can still generate a mailing label. After you've created your list, you can select between two popular Avery label sizes and print them using Microsoft Word. You can also download the list for a mail merge in Word.

Duffy says that usage of the new directory is governed by university policies in place at Rockefeller University concerning computers and computer systems. These policies point out that usage must be university-related. "Commercial usage is strictly forbidden," Duffy adds.

If you have questions or problems, the initial search page of the directory provides a list of e-mail addresses you can contact for assistance. To make suggestions or comments about the directory, send an e-mail message to diradmin.

RU community celebrates Chinese New Year at the Faculty and Students Club

The Chinese community of The Rockefeller University celebrated the year of Dragon at the Faculty and Students Club on Sat., Feb. 5. The year of the Dragon has always been considered special, as it symbolizes courage and good fortune. The Millennium Dragon is of particular interest because it signifies the beginning of a prosperous, peaceful golden age. Some 100 people from the university paticipated in Saturday's celebration. The event was organized by the Rockefeller Chinese Students/Scholars Association (CSSA) and partially sponsored by the MONY Life Insurance Company. CSSA gives special thanks to Toby Rodman for her generous contribution and to the Administration of The Rockefeller University.
Photo courtesy of Jun Wang.

Friday lecture, continued from page 1

there are innumerable possibilities for the creation of new drugs, vaccines, diagnostic tools, gene-based therapies and other medical innovations.

While these dividends will pay off in the long run, the present task is to develop the technology to automate the entire process of protein modeling so that large scale modeling of gene sequences is possible.

Nearly a dozen consortiums have been founded to determine the means and methods for approaching this daunting task. Šali, along with several RU faculty members including Professor Stephen Burley and Assistant Professor Terry Gaasterland, belongs to the New York Structural Genomics Research Consortium (NY-SGRC). Other institutions belonging to this consortium include Albert Einstein College of Medicine, Brookhaven National Laboratory, Mount Sinai School of Medicine and Weill Medical College of Cornell University. Determining the structure of all proteins via experimental methods is not feasible. Fortunately, the number of possible shapes and folds a protein can have is limited (estimates range from 1,000 to 5,000). These protein shapes and folds make up the Lego kit from which the structures of all proteins are built. Scientists have estimated that by determining the structure of 10,000 proteins, a library of protein folds and shapes (the complete Lego set) can be assembled, which can then be used to create theoretical models of almost every protein that exists in nature. The protein structures the NY-SGRC is currently working to define correspond to human proteins (and their yeast homologues) that cause or treat disease, as well as fungal, bacterial and viral virulence factors.

Šali's sights stretch beyond the horizon of identifying the structures of all proteins encoded in the genomes. He also is interested in collaborating with others to someday integrate all the information that has been gathered in genomics so that it is possible to see the big picture of what the data mean and to further limit the margin of error. While no data is perfect, cross-referencing information from different sources increases the accuracy of the data and will allow further knowledge to be extracted.

Šali's academic background is not computer science. He received his bachelor of science degree in chemistry from the University of Ljubljana, Slovenia. He then earned a doctoral degree in the Department of Crystallography at Birkbeck College, London, where he first began working on MODELLER. He completed the software as a postdoctoral fellow in the Chemistry Department at Harvard University. Arriving at RU in 1995, Šali was already well-accustomed to taking an RU-style, interdisciplinary approach to his research.

The importance of the work in Šali's lab is not going without notice. He has just received a grant from the Merck Genome Research Institute, entitled "Database of Comparative Protein Structure Models for Genomics." The grant award of $136,092 per year will help support his lab's research through Jan. 31, 2002.

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.

Potpourri

1999 FSA participants

If you participated in the Flexible Spending Account benefit in 1999, please be aware that all claims for expenses incurred in 1999 must be made before Sat., Apr. 15, 2000. Claim forms are available in Human Resources. If you have questions regarding flexible spending accounts, call Human Resources, x8300.

Call to authors

If you have recently published a book, journal article or other piece, *News&Notes* would like to know about it. Please send your publication particulars, along with a summary or copy of the piece to Ann-Marie Blaber at Box 68 or fax x7876.

Valentine's Raffle

Dining Services is offering a new reason to take your valentine to lunch on Valentine's Day (Mon., Feb. 14). Patrons at the Abby Dining Room can enter a raffle for chef John Karangis's homemade chocolate truffles, and diners in Weiss Cafe can participate in a raffle for a dozen long-stemmed roses. Both dining areas will also feature special holiday fare.

92nd Street Y Lecture

The 92nd Street Y will present a panel discussion on the legacy of Marilyn Monroe in Caspary Auditorium on Tues., Apr. 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.

Squash anyone?

If you enjoy the fine sport of squash, why not join RU's newly formed squash ladder? It should be up and running by March. To sign up or to learn more about the ladder, visit http://guitar.rockefeller.edu/~fmelo/squash/.

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Untangling transcription (continued from page 1)

determines where transcription starts on the gene. Roeder's lab showed that TFIID comprises a number of subcomponents specifically required for communication with the regulatory factors in addition to a small protein (TBP) that directly binds the TATA box and nucleates the assembly of RNA polymerase II and other general factors into a functional transcription complex. The structure of TBP in association with DNA and general factor TFIIB was solved in landmark studies by Professor Stephen Burley, an HHMI investigator.

"RNA polymerases and related accessory proteins, like TFIID, are general factors," Roeder says. "All genes use them. But their functions on individual genes are dependent upon, and regulated by, proteins called activators that are specific to certain genes."

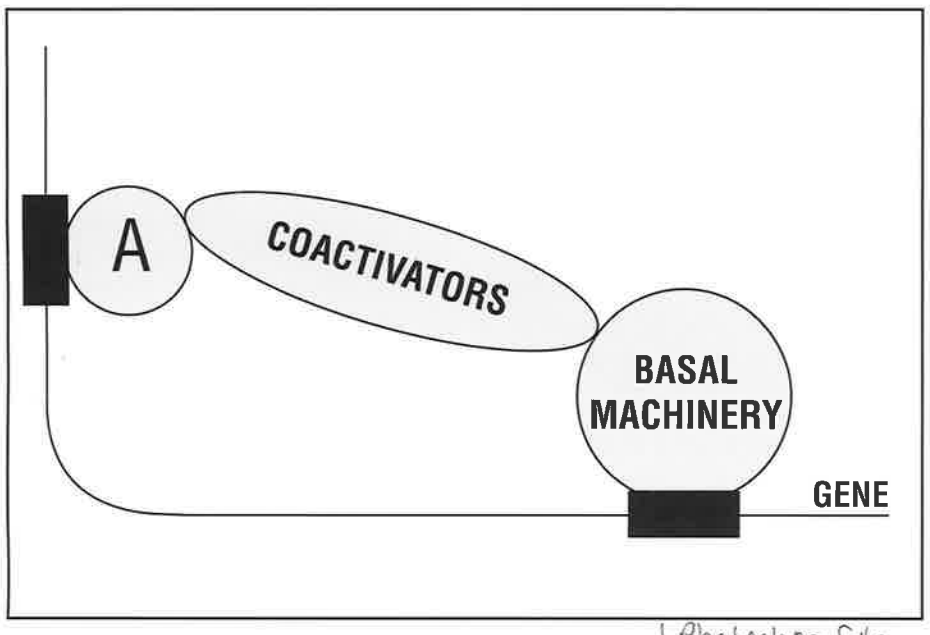
In the late 1970s, Roeder developed systems in test tubes in which individual genes cloned by recombinant DNA techniques were transcribed precisely as in the normal cellular environment. Roeder identified and cloned the first gene-specific transcriptional regulatory factor, called TFIIIA. TFIIIA and similar proteins stimulate the copying of the target gene by the RNA polymerases and accessory factors. Hundreds of these transcription activators have been subsequently identified by Roeder's lab and by others, and Roeder expects thousands more to be found that will regulate genes during such physiological processes as cell growth and division, and in hormonal processes, in virus infection and in tumor growth.

In the last five to 10 years, Roeder says, "we've uncovered a third layer of complexity in the transcription process with the discovery of coactivators." Coactivators, which may also be gene- or cell-specific, enhance the function of DNA-bound activators by serving as adaptors or bridges between these components and the general transcription factor. Some of these are ubiquitous and broadly used for most genes, while others, like a B-cell-specific coactivator of immunoglobulin genes, are more specialized.

Last year, Roeder's lab identified and characterized two large cofactor complexes found in human cells and showed that they are related structurally and functionally to protein complexes found in yeast. This provides further evidence that many molecules involved in this critical process are similar in organisms ranging from yeast to humans. However, some components novel to the human complexes were shown to be involved in the function of key regulators, like the tumor suppressor p53 and nuclear hormone receptors, that are not present in yeast.

Roeder says that over the years he has become increasingly interested in the applications of his research. "We need not only to understand the mechanisms underlying normal gene expression but to relate these to important medical problems at the same time," he says.

By demonstrating how the function of key factors may be altered, the studies will help clarify the reasons for various abnormalities in growth, development, and virus infection. Ultimately, it may lead to methods by which these abnormalities and their health-threatening consequences may be controlled.



A simplified look at the three levels of transcription: The first, called the basal transcription machinery, comprises the polymerases and general transcription factors, which are found in all genes and cells. The next includes the activators (A), which are specific to certain genes. The third level of complexity is made up of coactivators necessary for communication between the basal machinery and the activators.
Diagram courtesy of the Roeder lab.

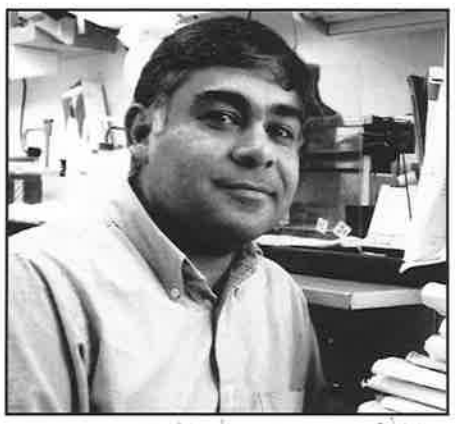
The Louisa Gross Horwitz Prize, named in honor of the daughter of prominent Philadelphia surgeon Samuel David Gross (1805-1889), has "predicted" more than 30 Nobel Prize winners since its inception in 1967. Eight scientists associated with Rockefeller University have received the Horwitz Prize. To date, four have gone on to win Nobel Prizes.

Robert Roeder (1999)
Arnold J. Levine (1998)
Günter Blobel (1987)*
Torsten Wiesel (1978)*
Henry Kunkel (1977)
Albert Claude (1970)*
George Palade (1970)*
Keith R. Porter (1970)

*Nobel laureate

At work in the Roeder lab: The three layers of transcription

During the 30 years since Professor Robert Roeder discovered the nuclear RNA polymerases and their corresponding accessory factors, scientists have sorted the protein complexes that orchestrate transcription into three



different categories that reflect the varying layers of complexity in this essential process (see figure above).

The first level comprises the polymerases and general transcription factors, which are found in all genes and cells and are called the basal transcription machinery. The next level includes the activators, which are specific to certain genes, such as the immunoglobulin (Ig) gene responsible for production of the antibodies that neutralize foreign invaders. The third level of complexity, made up of coactivators, was revealed only in the last decade. Coactivators are necessary for communication between the basal machinery and the activators.

By the 1990s, scientists—fueled by the groundbreaking work produced by Roeder's lab—had purified, identified and cloned the genes of most of the proteins that make up the basal machinery as well as many of the activators of transcription. But researchers were unable to recreate transcription activation in the test tube when these proteins were mixed with purified DNA, an essential test. This led Roeder and others to propose the existence of coactivators as a necessary biochemical link between the basal machinery and the activators.

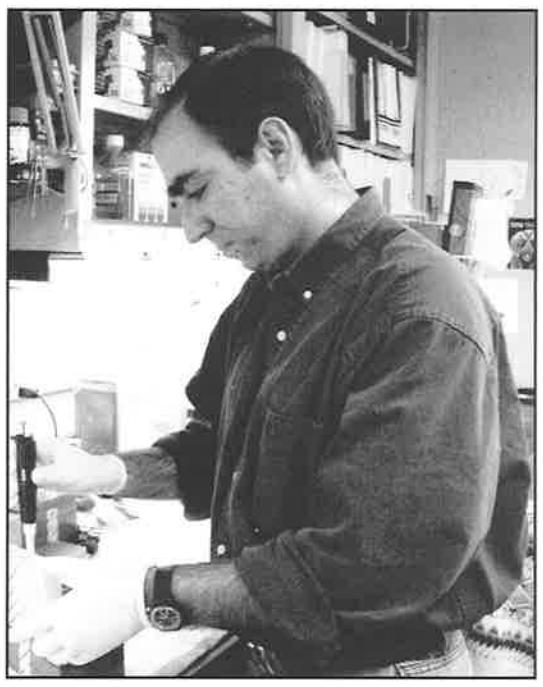
By the end of the last decade, Roeder's lab had filled in many of the pieces of this puzzle. One important discovery, called the "Holy Grail" of transcription by Research Associate Sohail Malik, was the identification of a protein complex in humans called TRAP/SMCC that is required to stimulate transcription. According to Malik, three separate research paths on coactivators in the Roeder lab converged to show that TRAP/SMCC served the same function as a distantly related protein complex in yeast, called Mediator. TRAP, a protein complex involved in transcription of the thyroid hormone receptor, was discovered by former postdoc Joseph Fondell in 1996, and SMCC was identified two years later. In early 1999, the Roeder lab showed that TRAP and SMCC are one and the same.

The similarity between the yeast Mediator and the human TRAP/SMCC is an important link, according to Malik, because Mediator was derived from genetic studies inside living cells. "At the same time, there are many differences, which only reflect the more complex nature of gene regulation in higher organisms." Malik focuses on the mechanisms by which the various initiator proteins work together and regulate the basal machinery.

Another coactivator under study in the Roeder lab is OCA-B, a protein found only in B cells of the immune system, which are important for antibody production. Assistant Professor Yan Luo identified, purified and cloned OCA-B in the mid-1990s and showed how it works in B-cell-specific transcription. Luo demonstrated that OCA-B could confer B-cell-level transcription to non-B cells, proving that OCA-B is B-cell-specific coactivator of transcription.

In collaboration with the Nussenzweig lab, he and others in the Roeder lab also produced a knockout mouse that lacked the OCA-B gene, and showed that OCA-B is indeed important for the immune response. Luo found another coactivator, called OCA-S, that is important for the transcription of a gene called H2B that produces one of the histone proteins and is active during the "S" phase of the cell cycle, when the DNA is duplicated and the number of chromosomes doubles.

From left to right: Research Associates Sohail Malik and Ernest Martinez, and Assistant Profesor Yan Luo at work in the Roeder lab.
Photos by Linne Ha.



DNA wraps around histones forming a structure called chromatin, which acts as a barrier to transcription. Research Associate Ernest Martinez studies how transcription factors "remodel" this barrier and initiate transcription. He also works on the human coactivator complex, in particular a coactivator called STAGA, which functions in concert with other coactivators, such as SMCC, that act after chromatin remodeling. STAGA contains more than 13 proteins, and in collaboration with the Chait lab, Martinez has been able to characterize almost all of them. "The next step is to look at the function of these proteins in the test tube, and try to repeat what happens in living cells," he says.

—by Joseph Bonner

calendarofevents

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http://www.rockefeller.edu/rucal

THE ROCKEFELLER UNIVERSITY—*Please post*

FRIDAY, FEBRUARY 11

12:00 p.m. **Inducible Mechanisms of Inhibition of Cytokine Signaling and STAT Activation**. Lionel Ivashkiv, Associate Professor of Medicine, HSS, WMCCU. Immunology Seminar. **117 Whitney, WMCCU, 1300 York Ave.** *Contact Michele Lavarde, 746-6452.*

12:00 p.m. **Regeneration in the Metazoans: Why Does It Happen?** Alejandro Sanchez Alvarado, Staff Associate, Dept. of Embryology, Carnegie Institution of Washington. 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, FEBRUARY 14

12:30 p.m. **Gene Therapy of Autoimmune Disease**. Garrison Fathman, Professor of Medicine, Division of Immunology and Rheumatology, Stanford U. Immunology Lecture. **Second Floor Conference Room, HSS, 535 East 70th St.**

4:00 p.m. **Development of NMR Methods to Study the Folding of Proteins and Oligonucleotides**. Harald Schwalbe, Assistant Professor, Dept. of Chemistry, MIT. NMR Structural Biology Seminar. **301 Weiss.** *Contact Milton Werner, 327-7221.*

TUESDAY, FEBRUARY 15

4:00 p.m. **Oscillation and Resonance**. Rodolfo Llinas, Professor, NYU. Center for Studies in Physics and Biology Seminar. **B Level Conference Room, Smith Hall Annex.** *Tea at 4:00 p.m. Contact Martin Zapotocky, 327-8835.*

WEDNESDAY, FEBRUARY 16

11:30 a.m. **Scifinder Scholar Database—Follow-Up for Questions**. Wentsai Wang, Senior Account Consultant, Chemical Abstract Services. Demonstration. **302 Weiss.** *Contact Pat Mackey, 327-8909. Open to RU community and guests only.*

12:00 p.m. **The Global Spread of the *M. tuberculosis* W Family Strains: From New York to Siberia**. Barry Kreiswirth, Director, The Public Health Research Institute, NYU. Seminars in Clinical Research. **110B Nurses Residence.**

4:30 p.m. **Oncolytic Viruses and Tumors: Turning One Scourge against Another**. E. Antonio Chiocca, Associate Professor of Neurosurgery, Mass. General Hospital and Harvard Medical School. Neurooncology Neuroscience Conference. **Hoffmann Auditorium, MSKCC, 1275 York Ave.** *Refreshments at 4:15 p.m. Contact Viviane Tabar, 639-8556.*

THURSDAY, FEBRUARY 17

11:00 a.m. **Endothelin-B Receptor Signaling in Neural Crest Development**. Myung Shin, Dept. of Molecular Biology, Princeton U. Developmental Biology Seminar. **301 Weiss.** *Contact Bobbie Larraga, 327-7240. Open to RU/WMCCU/NYPH/MSKCC community and guests only.*

12:00 p.m. **ATP and the Sodium Pump: A Tale of Two Sites**. Jose D. Cavieres, Faculty of Medicine and Biological Sciences, Dept. of Cell Physiology and Pharmacology, U. of Leicester, England. Physiology Seminar. **D-417 WMCCU, 1300 York Ave.**

4:00 p.m. **Langerhans Cells as Initial Targets for Virus during Sexual Transmission of HIV**. Andrew Blauvelt, Investigator, Dermatology Branch, NCI, NIH. LFKRI Research Seminar. **Lower Level Conference Room, New York Blood Center, 310 East 67th St.** *Tea at 3:45 p.m. Contact Rosanna Martinez, 570-3357.*

8:00 p.m. **Transcriptional Control of *Drosophila* Embryogenesis**. Michael Levine, Professor of Genetics, Dept. of Molecular and Cell Biology, UC Berkeley. Harvey Society Lecture. **Caspary Auditorium.** *All are welcome.*

FRIDAY, FEBRUARY 18

7:30 a.m. **Microdamage and Its Repair: A Fundamental Pathway in Bone Disease**. Bruce Martin, Professor, Davis Orthopedic Research Laboratories Research Facility, UC Sacramento. HSS Distinguished Lecture. **Second Floor Conference Room, HSS, 535 East 70th St.**

12:00 p.m. **JAK-STAT Signaling into the Nucleus**. J. Jillian Zhang, Assistant Professor of Pathology, WMCCU. Immunology Seminar. **117 Whitney, WMCCU, 1300 York Ave.** *Contact Michele Lavarde, 746-6452.*

12:00 p.m. **Modulation of Apoptosis by Cancer Genes**. Scott W. Lowe, Associate Professor, Cold Spring Harbor Laboratory. Cell Biology Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.**

TUESDAY, FEBRUARY 22

4:00 p.m. **Corticothalamic Dialogues: Connecting and Disconnecting the Brain**. Diego Contreras, Assistant Professor, Dept. of Neuroscience, U. of Penna School of Medicine. Progress in Neuroscience Seminar. **A-250 WMCCU, 1300 York Ave.** *Tea at 3:45 p.m.*

4:00 p.m. **Electrogenic Ion Transport by the Na, K-Atpase**. Hans-Juergen Apell, Professor, Universitat Konstanz. Center for Studies in Physics and Biology Seminar. **B Level Conference Room, Smith Hall Annex.** *Tea at 4:00 p.m. Contact Martin Zapotocky, 327-8835.*

WEDNESDAY, FEBRUARY 23

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

12:00 p.m. **Huntington's Disease: Recent Progress**. Anne Young, Mass. General Hospital, Harvard U. Seminars in Clinical Research. **110B Nurses Residence.** *Contact Dale Miller, 327-8411.*

THURSDAY, FEBRUARY 24

2:00 p.m. **Apoptosis in the Immune System**. Peter H. Krammer, Head of Tumor Immunology Program, German Cancer Research Center. Immunology Lecture. **Second Floor Conference Room, HSS, 535 East 70th St.**

3:00 p.m. **Neural Mechanisms Involved in Attentional Control: Neuroimaging and Lesion Studies**. B.J. Casey, Associate Professor, Sackler Institute, WMCCU. Systems Neuroscience Seminar. **305 Weiss.**

4:00 p.m. **Integrating Microbial and Human Genomics and New Vaccine Technologies to Develop Malaria Vaccines**. Stephen L. Hoffman, Director, Malaria Program, Naval Medical Research Center. LFKRI Research Seminar. **Lower Level Conference Room, New York Blood Center, 310 East 67th St.** *Tea at 3:45 p.m. Contact Rosanna Martinez, 570-3357.*

4:00 p.m. **c-Myc Target Genes in Tumorigenesis**. Chi Van Dang, Director, Division of Hematology, Johns Hopkins U. School of Medicine. Human Genetics Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.**

FRIDAY, FEBRUARY 25

12:00 p.m. **Biological Complications of Gene Amplification**. Masaaki Terada, President , National Cancer Center, Tokyo, Japan. Cell Biology Seminar. **116 Rockefeller Research Laboratories, MSKCC, 430 East 67th St.**

12:00 p.m. **Murine Bone Marrow Transplantation Models for Graft Versus Host Disease and Graft Versus Tumor**. Marcel van den Brink, Assistant Professor, MSKCC. Immunology Seminar. **117 Whitney, WMCCU, 1300 York Avenue.** *Contact Michele Lavarde, 746-6452.*

The Arts and Other Events

FRIDAY, FEBRUARY 11

12:00 p.m. **Tri-institutional Noon Recitals.** Andreas Klein, piano. Performing works of Beethoven and Chopin. **Caspary Auditorium.** *Contact John Gerlach, 327-7776. Open to RU/WMCCU/NYPH/MSKCC community and guests only.*

SUNDAY, FEBRUARY 13

3:00 p.m. **Chamber Music Concert.** Möbius String Quartet. Performing Ludwig Van Beethoven's *String Quartet in Bb Op. 130* and *Haydn's String Quartet in D Op. 76 No. 2*. **Caspary Auditorium.** *Contact Daniel Reich, 746-7540. Open to RU/WMCCU/NYPH/MSKCC community and guests only.*

FRIDAY, FEBRUARY 18

12:00 p.m. **Tri-institutional Noon Recitals.** FRUIT, performing a blend of Aussie acoustic-based pop and funk, flavored with an occasional twist of Latin or squall of punk aggression. **Caspary Auditorium.** *Contact John Gerlach, 327-7776. Open to RU/WMCCU/NYPH/MSKCC community and guests only.*

THE ROCKEFELLER UNIVERSITY

Friday Lectures & Thesis Presentations

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

FRIDAY, FEBRUARY 11

Comparative Protein Structure Modeling of Genes and Genomes. Andrej Šali, Assistant Professor, RU.

TUESDAY, FEBRUARY 15

***Thesis Presentation*: Effect of α-Oligosaccharide Phenotype on the Gonococcal Invasion of Human Epithelial Cells**. Sue Minor, Biomedical Fellow, RU.

FRIDAY, FEBRUARY 18

Tumor Immunity and Neuronal Function: New Insights from the Study of Paraneoplastic Neurologic Degeneration. Robert Darnell, Associate Professor, RU.

FRIDAY, FEBRUARY 25

Antagonists of *Hedgehog* and *Wnt* Signaling. Matthew Scott, Professor of Developmental Biology and Genetics, Stanford U. School of Medicine; Investigator, HHMI.

WEDNESDAY, FEBRUARY 23

8:00 p.m. **Peggy Rockefeller Concerts.** David Jolley, French horn, and Morey Ritt, piano. Performing works by Paul Dukas, Daniel Schnyder, Emmanuel Chabrier, Francis Poulenc and Eric Ewazen. **Caspary Auditorium.** *Contact Cathy Rogers, 327-8437.*

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