MCB AT BERKELEY

SPRING 2001 • *Vol. 4, No. 1*

Newsletter for Members and Alumni of the Department of Molecular & Cell Biology at the University of California, Berkeley

MCB and Psychology Target the Brain

The Helen Wills Neuroscience Institute was founded in response to a growing appreciation of the brain as the final frontier in biology. Now, with the generous support of several benefactors, six faculty positions, two of which have been filled, and its first crop of graduate students set to arrive in the fall, the Institute is making Berkeley an attractive destination for those who seek to understand the biological basis of thought and perception.

The human brain weighs less than a laptop computer, and yet somehow this lump of tissue handles learning, memory, behavior, emotion—all the functions that make us conscious beings. Two approaches to understanding the brain have already made great strides. One, the top-down approach, which begins at the level of behavior and seeks to understand the underlying brain functions, has largely been the province of psychology. The other, bottom-up, starts at the level of neurons and seeks to assemble them into complex networks. This is where molecular and cellular biology have made their contribution.

But in the end, neither one of these approaches will be quite enough on its own, says Institute director and Evan Rauch Professor of Neuroscience Corey Goodman. "You can study all of the individual neurons

continued on page 2 . . .

Sasha Gibbs, a graduate student in Mark D'Esposito's lab, and HWNI physicist Charlene Tan show off the fMRI machine at the Wheeler Brain Imaging Center.

Newsletter Name Contest

Help us rename the newsletter and win a PRIZE.

Since its inception in 1998, the MCB newsletter has been called simply MCB at Berkeley. Now we are looking for a new name, and we need your help. Send us your suggestions, witty or dry, outlandish or traditional, clever or not so clever. If your idea is chosen for the new name, not only will you have the satisfaction of seeing it in your mailbox every six months, but you will also receive a prize.

The winner will get a year's subscription to *New Scientist*, the international science and technology weekly (regular subscription rate is $140). We will also select two runners-up to receive a department T-shirt. If more than one person suggests the same name, only the first entry we receive is eligible for a prize, so don't delay. Send us your idea today. All entries must be received by September 1, 2001. See page 7 for instructions.

. . . Continued from page 1

and genes in the brain, but at the end of the day you still don't know how the brain works —how we see, how we perceive," he says.

The Helen Wills Neuroscience Institute (HWNI) bridges those two approaches. It seeks the links between genes and genomes, neurons and circuits, circuits and systems, systems and behavior. The ultimate goal, Goodman says, is to build a holistic understanding of the brain.

The HWNI is a fusion of 40 research labs from seven departments, mainly MCB and Psychology. The HWNI sponsors three technology centers—Molecular Imaging, Neurogenomics and Brain Imaging—and hosts its own graduate program (see sidebar). Named after tennis great Helen Wills, whose estate has donated $10 million for neuroscience at Berkeley, of which half helps endow the graduate program, and half helps build the technology centers and recruit faculty. The HWNI is one of the few doctorate-awarding extra-departmental programs on campus that also has the resources to hire faculty.

How best to attract promising young neuroscience faculty to Berkeley, especially working at the systems and cognitive level of analysis, was already an important question several years ago, when the institute was still the Neuroscience graduate group. Part of the answer, Goodman says, was a to get a big magnet.

Functional magnetic resonance imaging (fMRI) produces detailed views of the brain in action. It senses slight changes in the concentration of oxygenated hemoglobin associated with neural activity and uses these to spot the most active regions. Although fMRI has become indispensable to neuroscience, most instruments are located at hospitals, where access for research is limited. Getting one on campus would be a powerful draw to top neuroscientists.

But a magnet costs money, and finding a donor for an institute with no faculty would have been quite a challenge. So Goodman asked the university for a $5 million loan. The idea, he says, was to get the magnet, bring in some faculty, and then find a donor. It soon paid off. Henry H. "Sam" Wheeler, Jr., a sound southern California businessman with a penchant for cutting edge technology, picked up the tab and in November the HWNI unveiled the Henry H. Wheeler, Jr. Brain Imaging Center.

Now an inconspicuous building the size of a double-wide trailer in Wellman Courtyard is home to the most powerful magnet in the country dedicated to brain research. Most hospital MRI machines use 1.5 Tesla magnets, although a few at major research hospitals run as high as 4 Tesla, the strongest approved for human use. To do research on these, neuroscientists usually have to wait until after hours, so most fMRI experiments are done in the middle of the night.

"That means it's not the normal brain they are imaging but the very sleepy brain," says Goodman. The Berkeley magnet is 4 Tesla and 100 percent for research.

Not only is that good for the condition of research subjects, but the experimenters can also rig up all sorts of paraphernalia that would have to be removed from a hospital machine every day. These include devices to produce smells and visual cues, and users are now developing a shield to block the loud noise of the machine generates for functional experiments on the human auditory system.

The first faculty member to be hired by the HWNI was Mark D'Esposito, a neurologist who uses fMRI to investigate the effects of aging on the brain. He joined the HWNI and Psychology department in July, 1999. The following summer, Noam Sobel, who uses fMRI to study olfaction, accepted the second HWNI faculty post as an assistant professor of psychology. As with all faculty associated with the HWNI, they have a home department outside the Institute. Four positions remain to be filled.

Continued on page 6 . . .

MCB at Berkeley is published twice a year by the Department of Molecular and Cell Biology at the University of California, Berkeley.

DESIGNER: *Betsy Joyce*

EDITOR: *Jonathan Knight*
Articles are written by Jonathan Knight unless otherwise noted.

SEND ADDRESS CHANGES TO:
alumrecs@dev.urel.berkeley.edu

SEND COMMENTS TO:
MCB Newsletter
University of California
Department of Molecular and Cell Biology
597 Life Sciences Addition #3200
Berkeley, CA 94720-3200
OR E-MAIL: *jonknight@nasw.org*

This and previous issues of the newsletter are available on the MCB web site (http://mcb.berkeley.edu/news/).

HWNI Gets First Grad Students

The first six students accepted to the Graduate Program in Neuroscience will arrive in the fall. Administered by the Helen Wills Neuroscience Institute and MCB, the program takes 5 to 10 students a year.

Despite having nothing but a Web site to advertise itself to potential applicants for the coming academic year, the program easily filled its first class. Concerns that the program would get off to a slow start were unfounded, says program director and MCB professor John Ngai. "We got about 78 applicants, many of whom were outstanding," he says.

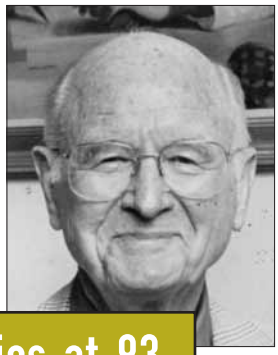
The majority of the new students have declared an interest in either systems neuroscience, which focuses on components of the nervous system like vision and smell, or cognitive neuroscience, which seeks to understand the neural basis of thought, learning, memory and behavior. One of the new students, Christina Karns, is a recipient of UC Berkeley's most prestigious graduate fellowship, the Berkeley Fellowship.

MCB graduate students interested in neuroscience have always been able to work toward a Ph.D. in Neuroscience. Currently two students are using this option.

But the new students' training will be geared toward neuroscience from the day they arrive. They will be able to rotate in any of the 40 labs in 7 departments that have allied themselves with the Neuroscience Institute. And the coursework will be dedicated to neuroscience topics. In addition to the required general survey course, MCB 260: Advanced Principles in Neuroscience, students choose from a broad list of graduate seminars such as Vision Science 216: Color Vision, Psychology 220C: Human Memory, and MCB 263: Advanced Developmental Neurobiology.

The program provides support for graduate students with a combination of money from the Graduate Division, the Helen Wills endowment of the Neuroscience Institute and the program's NIH training grant in neurobiology. The stipend for 2001-2002 is $23,000, up from $21,000 this year.

Care has been taken in designing the program to make sure it does not compete with existing programs, like MCB and Psychology, Ngai says, but rather makes Berkeley a more attractive option for the growing number of applicants who want to devote themselves to neuroscience. "It's meant to augment and complement the MCB graduate program," he says. "It will allow us to attract the best students."



Barker Dies at 93

Horace Albert Barker, professor emeritus of biochemistry and one of the preeminent biochemists of the 20th century, died Dec. 24, 2000, at his home in Berkeley after a brief illness. He was 93.

Barker is best known for work in the late 1950s on the biochemical function of vitamin B-12. He was also was a member of the team that, in 1944, first worked out how cells synthesize sucrose. This feat involved one of the first uses of radioactive carbon-14 tracers, which Barker helped pioneer.

His studies in vitamin chemistry, bacterial metabolism, fatty acid oxidation and synthesis, carbohydrate transformations and amino acid and purine metabolism form the basis of much of our current understanding of metabolism and its role in sickness and health.

"He was a true leader in biochemistry and a leader on campus, widely respected internationally and by his Berkeley colleagues," said Daniel E. Koshland Jr., professor emeritus of biochemistry.

Born in Oakland, Calif., Barker graduated in 1929 from Stanford University, where he also received a Ph.D. in chemistry four years later.

Barker became an instructor in soil microbiology at the University of California in 1936. He was named a professor in the department of biochemistry when it was first established in 1959 and served as chairman in the 1960's.

Barker won numerous awards for his achievements, including the National Medal of Science in 1968 and election to the National Academy of Sciences and the American Academy of Arts and Sciences. In 1988, the University named the biochemistry building on the northwest corner of campus H. A. Barker Hall.

Barker retired in 1975, but he remained active in the department well beyond his 80th birthday.

FACULTY NEWS

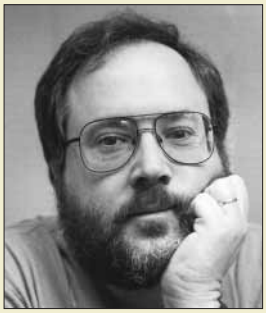
HONORS

Sharon Amacher (Genetics and Development) has received the Basil O'Connor Starter Scholar Research Award, a two-year grant in support of her research.

Bruce Ames (BMB) has been awarded the Abbott-American Society for Microbiology Lifetime Achievement Award.

Carolyn Bertozzi (BMB and Chemistry) received two awards in April. She received the Award in Pure Chemistry from the American Chemical Society at its San Diego meeting. And she is also one of this year's four recipients of the university's highest faculty award, the Distinguished Teaching Award.

Corey Goodman (Neuroscience) is a co-recipient of this year's March of Dimes Prize in Developmental Biology for discoveries that have helped "revolutionize the understanding of brain wiring and how it goes awry in birth defects and adult diseases." He will split the $100,000 award with Thomas Jessell, professor of Biochemistry and Molecular Biophysics at Columbia University.



▲ **Gerald Rubin** (Genetics and Development) received the AAAS Newcomb Cleveland prize for his publication of the fruit fly genome sequence in March 2000. He was also selected to be part of an eight-member panel to oversee the future direction of the Department of Energy's Joint Genome Institute in Walnut creek.

Howard Schachman (BMB) was awarded the Scientific Freedom and Responsibility Award by the American Association for the Advancement of Science for his efforts in addressing research fraud and how it should be regulated by the government.

APPOINTMENTS

Alexander Glazer (BMB) was elected to the National Academy of Sciences.

▲ **Caroline M. Kane** (BMB) has been appointed to the Board of Directors of the California Alumni Association, with a term to begin on July 1.

▲ **Daniel Portnoy** (BMB) was elected as a member of the American Academy of Microbiology.

NEW FACULTY

Michael Marletta

As a poisonous gas, nitric oxide might not seem the best choice for cellular communications, yet it is one of the most important signaling molecules in the body. It causes blood vessels to relax and rapidly activates nerve cells. At the same time, white blood cells can churn out nitric oxide (NO) to kill invading bacteria and parasites, making it a critical frontline defense against infection. How does the body manage to use NO for both signaling and killing without hurting itself in the process?

Michael Marletta has been on the forefront of NO research since its signaling properties were first discovered in the mid 1980s. His research has helped to answer some of the basic questions about NO biology, although a great deal is still to be discovered.

In 1999, for example, the lab worked out how a cell can receive the NO signal while avoiding any toxic effects. Nitric oxide was known to boost levels of cyclic GMP in target cells by activating soluble guanylate cyclase (sGC). This enzyme turns out to have a unique heme which, Marletta's group found, is finely tuned to favor binding NO over other gasses, even oxygen. The sGC heme is such a powerful binder of NO that it out-competes potentially toxic reactions in the cell. Marletta also found that sGC activation depends on nitric oxide concentration, so subtle changes in NO levels might be one way the vasculature maintains constant smooth muscle tone.

Marletta's group is also researching the production of NO in response to infection. They are currently in the midst of studies that might explain how some pathogens, such as Mycobacterium tuberculosis, resist the toxic effects of NO.

Several projects in Marletta's group are not directly related to NO. These include looking at novel metabolic pathways in the malaria parasite and understanding the biosynthesis of the critical co-enzyme lipoic acid.

Marletta, currently the John G. Searle Professor of Medicinal Chemistry and Professor of Biological Chemistry, has been a Howard Hughes Investigator since 1997. In 1995 he was awarded a MacArthur Fellowship for his contributions to biological chemistry. And in 1999 he was elected to the Institute of Medicine.

After 14 years at the University of Michigan, Marletta will come to Berkeley this summer to a joint appointment in MCB and Chemistry. Marletta first lived in the Bay Area as a graduate student at UCSF in the mid 1970s, and he says he is looking forward to returning. But his main reason for coming to Berkeley was the university's strong support of interdisciplinary research. "I am a firm believer that the most exciting discoveries are made at the interface of disciplines," he says.

Nine members of his current group are moving out with him. Since he would like to have around 20 students and postdocs, he says he will be open to graduate student rotations this fall. "If they are interested, I certainly am."

Abby Dernburg

Sex wouldn't be much use without meiosis, the special form of cell division that makes eggs and sperm. During the first of the two meiotic cell divisions, the chromosomes of the primordial sex cell perform a unique dance not found in run-of-the-mill mitosis. They line up with their homologous partners, link arms (so to speak), and exchange stretches of genetic material before splitting off into separate daughter cells. Thus the union of sperm and egg can mix and match the parents' chromosomes in a unique combination for the next generation. That reshuffling is, evolutionarily speaking, the purpose of sex.

Dernburg's lab studies the events that make meiosis different from mitosis. The central questions are how the chromosomes are induced to undergo that unique dance, and how its steps are controlled.

The whole process is steeped in mystery. How do homologous chromosomes find each other in the jumble of condensed chromatin crowding the dance floor? How is the molecular process of crossover recombination, or genetic exchange, coordinated with this dance? These genetic exchanges are tightly controlled—they occur only once per chromosome pair in nematodes, for example—but exactly how they are regulated is unknown.

Finally, the centromeres, sites where protein handles form for the spindle fibers that pull the chromosomes apart, must switch rapidly from a mode that separates homologous chromosomes in the first meiotic division, to a completely different

mode that separates the two replicated strands of the same chromosome in the second division. How they do it remains a mystery, particularly in organisms like the nematode where centromeres do not have a defined position and microtubules attach all along the chromosomes.

Dernburg uses the nematode *Caenorhabditis elegans* as a model organism for studying meiosis. The animal's transparency and regimented cell division make it fairly easy to see what's wrong when the process goes awry as a result of some experimental disruption. That's critical, says Dernburg, because no one yet knows how to reproduce the key events in the test tube.

Grad students coming into the Dernburg lab would have a number of possible projects open to them. One might be to go after non-coding sequences on chromosomes that help regulate meiosis. This could involve a computational search for unusual sequences followed by reverse genetics to test the effect of disrupting them. Another could be the development of real-time 3D imaging to observe meiosis in live animals.

Dernburg says she wants to keep her lab relatively small at first, taking on maybe 4 to 6 postdocs and grad students. At LBNL she is also collaborating with staff scientists to develop new technology.

Dernburg joined the department in January as an Assistant Professor in Residence with the CDB division. She holds a joint appointment as a Divisional Fellow at LBNL. Before coming to Berkeley, she was a postdoc in Anne Villeneuve's lab at Stanford. Her graduate work was in John Sedat's lab at UCSF. Before that, she was an undergraduate here at Cal, about which she says: "aside from some strange time-warp phenomena I've been experiencing, I'm thrilled to be back on the campus."

Jamie Cate

Biology texts usually portray the ribosome as two blobs, one bigger than the other, clamped onto a thread of messenger RNA and extruding a new protein chain. That's fine as far as it goes, but considering that translation makes up half the central dogma of molecular biology—DNA→ RNA→ protein—it's very unsatisfactory.

Only in the past few years has a clearer picture of translation begun to come into focus, and Jamie Cate has been a key player in that process. As a postdoc in Harry Noller's lab at UC Santa Cruz, Cate solved the crystal structure of the complete bacterial ribosome in 1999 to a resolution of 7.8 Ångstroms (Science, 285, 2095). This solution revealed many details of the ribosome's contacts with its three attached transfer RNAs, but left many parts of the picture fuzzy. Other groups have solved atomic-resolution structures of the isolated large and small subunits (50S and 30S), but these reveal only limited mechanistic details, as translation requires the entire 70S ribosome.

Now Cate and the Santa Cruz group have solved the same crystal to a resolution of 5.5 Å. The electron density map includes all three bound tRNAs, all three ribosomal RNAs, and most of the ribosomal proteins. It shows that ribosomal RNA dominates the interface of the large and small subunits where the tRNAs bind, consistent with the idea that rRNA is central to the ribosome's function. It's the clearest picture yet, but many mysteries remain.

For one, these images only reveal what the ribosome-tRNA complex looks like in its "committed" state, after the proper tRNA matching the codon to be translated has bound. But in decoding the RNA message, the ribosome must presumably try and reject many mismatched tRNAs before the right one comes along. A major part of the effort in Cate's lab is devoted to working out the details of this process.

A related project, in collaboration with Adam Arkin in the Chemistry department, is to completely reconstitute a translation system *in vitro* in which the components are at concentrations close to those that occur in the bacterium. These are vastly higher than the concentrations in a typical *in vitro* translation kit from Amersham, for example, resulting in very different kinetics.

Cate is also very interested in the regulation of protein synthesis in eukaryotes, particularly its initiation. Much of this work is in collaboration with Cate's spouse, Jennifer Doudna, a professor at Yale. Doudna also officially joins the Berkeley faculty this summer, but will be on leave at Yale until 2003 (her profile will appear in a future issue).

Cate leaves his current position as an assistant professor at MIT in June to take up a joint appointment in the BMB division of MCB and Chemistry. He says he would like his lab to be medium-sized, with 10 to 12 students and post-docs at the most. And of course he can't wait to get back to California's fresh fruits and vegetables and the outdoor lifestyle.

Continued from page 2 . . .

The next major HWNI acquisition will probably be a mouse magnet of 8 or more Tesla. Goodman expects the magnet to interest many labs outside the Institute, in MCB in particular, because it can be used to image far more than the brain. For example, mouse models of cancer can be monitored regularly for tumor growth in the live animal. "It's not just for neuroscience, it's for everyone doing biomedical research," Goodman says.

A second technology center at the Institute makes chips. The Neurogenomics Center can produce both standard and custom microarrays, also called gene chips, which allow the user to monitor the expression of thousands of genes at once. Two robots at the center can print up to 20,000 spots on a glass slide at a rate of 137 such slides every two days.

The center is still gearing up to its full potential, says director John Ngai, but already it has standard arrays for gene expression profiling in fruit flies, mice, zebrafish and nematodes.

The Molecular Imaging Center, the third major piece of technology at the HWNI, features some of the hottest microscopy equipment available today. The objective of the center is to develop methods of following proteins and cellular processes in living neurons, brain slices, and even intact brain.

Confocal microscopy, which optically scans through different planes of a preparation, can make 3D images. In living samples, real-time video is possible (often referred to as 4D imaging). Better still, projects are underway to engineer proteins to change their optical output when they are bound or modified by other proteins. This method should reveal the biochemical transactions within a neuron—binding of neurotransmitters or docking of synaptic vesicles—in minute detail.

So far, the Institute has no central physical presence. Its labs and offices are spread all over campus. But in a few years it will have a home in the new building planned where Warren Hall now stands. At that time many of the labs will be able to move closer together.

That should foster even more interaction between labs and departments. At the moment, much of the Institute's cohesion comes from a series of seminars held most Fridays at noon and of course the annual retreat. Co-sponsored by MCB and the Institute, this campus-wide event was enormously popular last year, not least because it was held at the Granlibakken Conference Center on Lake Tahoe. Such get-togethers really help, Ngai says. "Every year I feel I am more able to converse with my colleagues in psychology."

For more information, visit the HWNI website: http://neuroscience.berkeley.edu/

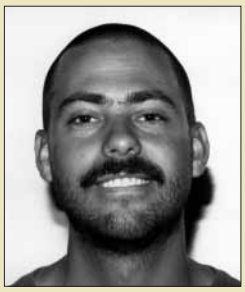
AWARD WINNERS

GRAD INSTRUCTORS WIN AWARDS

The following MCB graduate students received Outstanding Graduate Student Instructor (OGSI) awards for the 2000-2001 academic year:

Doreen Cunningham

Bridget O'Keeffe



Brian Avery

Gretchen Diehl

Jennifer Powell

Kimberly Best

Jamie Geier

Michelle Burbea

Dilnawaz Kapadia

Botond Roska

UNDERGRADUATE AWARDS

- MCB Departmental Citation – Paul Scherz (Skarnes Lab)
- MCB Department Outstanding Scholar – Nadia Roan (Alber lab)
- BMB Yanaba-Jung Memorial Prize – Shirin Bahmanyar (Thorner/Alber labs)
- BMB Fimognari Memorial Prize – Erin Duncan (Volkman/Jackson labs)
- BMB Carpenter Memorial Prize – Lawrence Shiow (Thorner lab)

Division of Genetics and Development

- Spencer W. Brown Award
  Annie Fu-Jui Kuo and Kevin M. Vogeli

Division of Immunology

- Outstanding Undergraduate
  Sarah M. Choi

Divisions of Cell and Developmental Biology and Neurobiology

Chaikoff Memorial Awards

- Chih-Yuan Chiang
- Christiane Haeffele
- Rajan Jain
- John Kim
- Robyn Kuroki
- Mary Leigh
- Chinwe Okoye
- Marissa Vadi
- Tin-Wing Wong
- Ryan Young
- Loree Tamanaha

GRADUATE AWARD

- Michael C. Miller (Collins Lab) is one of thirteen graduate students nationwide to receive the Harold M. Weintraub Graduate Student Award, sponsored by the Fred Hutchinson Cancer Research Center in Seattle.

Name Contest

Help us name the MCB newsletter and you may win a prize (see front page).

There are three ways to enter:

1. Go to http://mcb.berkeley.edu/news/contest.html and fill out the Web form
2. Email your entry to mcbcontest@home.com
3. Clip out the form below and mail it to the MCB Newsletter at the address at right. If you are mailing both a contest entry and the alumni survey form, feel free to send them in the same envelope.

NAME

YOUR ENTRY

HOW YOU CAN BE REACHED *(In case you win)*

Alumni Survey

Let your classmates and MCB friends know what you have been doing. Please complete the following and mail it to:

MCB Newsletter
University of California
Department of Molecular and Cell Biology
597 Life Sciences Addition #3200
Berkeley, CA 94720-3200

Please send address changes to alumrecs@dev.urel.berkeley.edu

NAME

DEGREE(S) CONFERRED AND YEAR

E-MAIL ADDRESS

May we print your e-mail address?
❍ Yes ❍ No

What's your current occupation?

Other activities since leaving MCB:

Any additional information or news:

Alumni News

If you haven't told us what you are up to lately, please take a minute to send in the form on page 7. Or you can answer the survey online at http://mcb.berkeley.edu/alumni/survey.html or send email to jonknight@nasw.org. Please note: address changes should be sent to alumrecs@dev.urel.berkeley.edu.

Undergraduate Alumni

1994

- **Duke Duguay** has been a management consultant with Princeton Consultants, Inc., since receiving his Ph.D. in molecular biology from Princeton University. E-mail: dduguay@alumni.princeton.edu.

- **Amy Kilbourne** is Assistant Professor of Medicine at the University of Pittsburgh. She received her Masters of Public Health (1996) and her Ph.D. (1999) from UCLA. E-mail: amy.kilbourne@med.va.gov

- **Warren Roberts** is a Neurosurgery Resident at the Oregon Health Sciences University in Beaverton. He graduated medical school at UCLA in June, 2000. E-mail: WGRobe@aol.com.

- **Anand P. Chokkalingam** has been a doctoral fellow at the National Cancer Institute since 1999. He got a Ph.D. in epidemiology from the University of Maryland after two years at a medical diagnostics company. Next year he will start a postdoc at NCI working on the molecular epidemiology of prostate cancer. E-mail: chokkala@mail.nih.gov.

1995

- **Andrea Y. Lin** is a first year law student at Loyola Marymount University in Los Angeles. Before that, she was a controller with Wall Street On Demand, and investment research company in Boulder, Colorado. E-mail: andrealin00@hotmail.com

- **Aldous D. Sumaylo** is a first-year resident in pediatrics at Children's Medical Center of Dallas in the University of Texas Southwestern. He received an M.D. from Temple University in Philadelphia in May, 2000.

1997

- **Kenneth K. Chang** is a third-year medical student at the University of Hawaii. He got a Masters of Public Health from Johns Hopkins University after his second year in medical school. He says: "I want to be back at Berkeley." E-mail: kennethkchang@yahoo.com

1999

- **Duncan R. Sousa** is a first year graduate student at Brandeis University. E-mail: lolithrin@hotmail.com

Graduate Alumni

1991

- **Eric C. Liebl** is Associate Professor of Biology at Denison University, a 4-year liberal arts college in central Ohio. He has been at Denison since he completed his postdoc in 1994. E-mail: liebl@denison.edu.

- **Ron Swanson** is Director of Molecular Biology at Syrrx, a drug discovery company in San Diego. He did a postdoc with Mel Simon at Cal Tech and was then Director of Genomics at Diversa for six years. His son Calvin is five. E-mail: ron.swanson@syrrx.com.

1994

- **Constance M. Smith** was recently appointed Scientific Curator at The Jackson Laboratory in Bar Harbor, Maine.

1996

- **Lubor Gaal** is Associate Director of New Business Opportunities at Berlex Laboratories in New Jersey. He says he enjoys discovering how to translate great scientific ideas into new drugs. "I left the bench in 1997 and never looked back." E-mail: lubor@home.com.

1999

- **Camillan Huang** has been Virtual Labs Project Manager at Stanford University for a year and a half. The job is not related to her thesis work, she says. E-mail: cammyhuang@yahoo.com.

MCB Newsletter
University of California at Berkeley
Department of Molecular and Cell Biology
597 Life Sciences Addition #3200
Berkeley, CA 94720-3200

ADDRESS SERVICE REQUESTED

12133NEWSL

Non-profit Org.
U.S. Postage PAID
University of California