

# MCB

AT BERKELEY

SPRING 2000

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

## New Beamline Facility for Advanced X-Ray Crystallography

A new X-ray beamline, a powerful instrument for X-ray crystallography, is being assembled at the Lawrence Berkeley National Laboratory's Advanced Light Source (ALS). The \$2.4 million effort is being led by MCB professors Tom Alber, James Berger, and Robert Glaeser, together with UC San Francisco professors David Agard, Robert Stroud, Robert Fletterick and Wendell Lim. X-ray beamline technology is "revolutionizing structure determination in biology," said Alber. "It is like PCR is to molecular biology."

The ALS and other synchrotron sources are large particle accelerators, and the intense X-rays they generate can be used to determine molecular structures at atomic resolution. Synchrotron radiation provides many technical advantages over traditional laboratory X-ray sources, including the ability to use smaller crystals which are often easier to obtain. Also, since synchrotron radiation is tunable, data can be collected from a single crystal analyzed at several different wavelengths, as opposed to multiple crystals each with a different metal bound. Data obtained from a single crystal is clearer and simpler to interpret, making it possible to solve larger, more complex structures. In general, beamline technology increases the speed with which structures can be solved, thus increasing research productivity. The new X-ray beamline will "let UC Berkeley and UC San Francisco push experimental programs much more rapidly," said Berger. "What now takes months or

years of data analysis will take only weeks or days, and eventually hours."

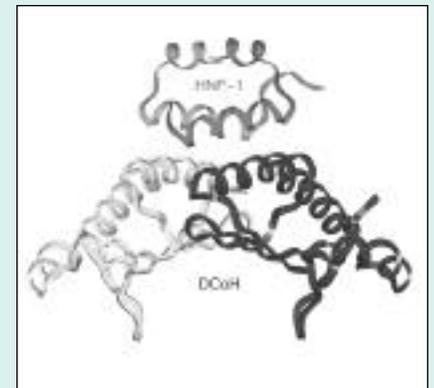
MCB researchers will have routine access to the new beamline facility, which is expected to be up and running by early 2001. Currently, Alber said, MCB crystallographers must apply for time at oversubscribed national beamline facilities. In fact, he said, there is not enough X-ray beamline time worldwide to meet the demand. With only five synchrotron sources in our country, Berger said, "it is quite an advantage to have one right up the hill."

Funding for the X-ray beamline is from both public and private sources. A grant for major research instrumentation was obtained from the National Science Foundation, and the required matching funds were supplied by the UC Berkeley and UC San Francisco campuses. A generous gift from Henry H. Wheeler Jr. will ensure purchase of the most advanced technology and provide for technical staff. "Wheeler has expressed an appreciation for the quality of our research here at Berkeley," said Paul Licht, dean of Biological Sciences. "He is particularly interested in encouraging collaboration between UC Berkeley and UC San Francisco faculty, and the X-ray beamline project allows him to do just that."

New avenues of research made feasible by beamline technology include developing programs in structural genomics. This new science aims to define new protein folds and functions using high-throughput X-ray

crystallography to obtain structural information about the protein products of the tens of thousands of newly sequenced genes coming out of the human genome project and other genome sequencing projects.

The promise of beamline technology has also led to the formation of a consortium of researchers from around the world, including MCB professors Alber, Berger, and Susan Marqusee, who plan to solve the structures of hundreds of potential drug targets from the bacterium that causes tuberculosis. The project's acronym is STOP TB.



*When traditional X-ray crystallography failed, beamline technology was used to determine the structure of the DCoH protein (bottom) bound to a fragment of the gene regulator HNF-1 (Hepatocyte Nuclear Factor-1; top). The DCoH coactivator stimulates the activity of HNF-1. Mutations in HNF-1 can cause diabetes, and this cocystal structure revealed for the first time the structural effects of these disease-associated mutations. (Image provided by MCB Professor Tom Alber.)*

# UNDERGRADUATE PROGRAM



by Regan Ronayne, Supervisor of the Undergraduate Affairs Office

Since the reorganization of Berkeley's life sciences in 1989, the MCB undergraduate program has matured from a fragmented conglomerate into a solid curriculum of excellence that is now the largest major on campus. Over the past decade, the MCB major has grown from 745 declared majors to today's 1250 students.

To serve the individual needs of the growing student population, the MCB Undergraduate Affairs Office (UAO) was created in 1995. Located in the Valley Life Sciences Building, the UAO offers a welcoming departmental home to its students. Often crowded but always inviting, the office provides dedicated student affairs officers, helpful peer advisors, a large collection of reference materials, a student-accessible computer, and handsomely maintained bulletin boards. The UAO staff also design and implement recruitment and support programs such as Focus on Freshman, the Transfer Student Reception, the Honors Research Symposia, and MCB's Cal Day Information and Poster Sessions. To contend with the constraints of a small staff and space, the UAO relies heavily on the Internet to reach its students, recently launching a web

site ([mcb.berkeley.edu/undergrad/](http://mcb.berkeley.edu/undergrad/)) and regularly sending news and information to over 1600 students via the electronic mailing list MCB-Infoline.

The MCB Undergraduate Affairs Committee (UAC) oversees the academic programs and curricula. Comprised of faculty advisors with staff and student representatives, the UAC is charged with reinforcing undergraduate education and acting as a conduit for student and faculty concerns. UAC Chair, Professor Gary Firestone, describes the committee as the interface between students, the MCB academic environment, and faculty. In recent years, the committee has reevaluated the MCB core curriculum and strengthened the requirements of the MCB Honors Program. Currently, the UAC is developing a new emphasis within the MCB major to meet the educational needs of the department's large pre-professional student population. (In the MCB Class of 2000, 56% of students are headed to health professional schools, 14% to graduate programs, and 17% to related industry.) The new major emphasis will provide additional choices in upper division electives to accommodate those who are fulfilling pre-professional requirements.

The student clubs, **mcbUSA** and **MCBcDNA**, help the department reach and respond to its many hundreds of undergraduates. Supported by gifts to the department, the clubs organize many useful and popular activities to aid and guide fellow students.

The MCB Undergraduate Student Association, or **mcbUSA** ([socrates.berkeley.edu/~mcbusa](http://socrates.berkeley.edu/~mcbusa)), was formed ten years ago. At that time, the club started the department's first peer advising program for undergraduates. That program was transferred to the UAO after the office was established. Today, the members of **mcbUSA** focus on other service programs such as the mentorship program which assists undeclared freshmen and sophomores in preparing for the major by pairing them with MCB juniors and seniors. An outreach program brings Bay Area high school students to the Berkeley campus for day-in-the-life experiences with MCB students.

MCBcDNA ([mcb.berkeley.edu/groups/mcbcdna](http://mcb.berkeley.edu/groups/mcbcdna)) was founded in 1991 as the MCB



In the reception area of the Undergraduate Affairs Office, Intake Advisor Lauri LaPointe (at far left) talks to students while other students (seated) take part in a peer advising session.

Cell/Developmental/Neurobiology Association, but now represents and serves undergraduates in every MCB division. Each year, MCBcDNA hosts many highly attended events at which invited guest speakers and experienced students share their wisdom with interested undergraduates. Such events include Course Advising Night, MCAT/GRE Night, Post-Baccalaureate Night, the Career Fair, the Biotech Fair, and the Research Lab Seminar. In the past year, the club has focused on increasing interaction between students and faculty through the introduction of the Faculty-Student Reception and the more intimate Faculty-Student Dinners.

The members of the student clubs, with their energy, enthusiasm, and initiative, are an invaluable human resource for the department. Such enthusiastic participation of superb students, the expert teaching and direction of the faculty, and the capable administration of the staff collaborate to create a program that offers a plethora of options and opportunities to enhance the education and preparation of Cal's undergraduates in molecular and cell biology.

*MCB at Berkeley is a publication of the Department of Molecular and Cell Biology at the University of California, Berkeley*

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*Graphic on page 3 is by Camin Dean.*

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*Current and past issues of the newsletter are available on the MCB web site ([mcb.berkeley.edu/news/newsletter.html](http://mcb.berkeley.edu/news/newsletter.html)).*

## MCB in the News

■ Genetics and Development Professor **Gerald Rubin**, head of the Berkeley *Drosophila* Genome Project, and J. Craig Venter, the president of Celera Genomics Inc., reported the effectively complete sequencing of the *Drosophila melanogaster* genome in a special issue of *Science* on March 24, 2000 (Vol. 287, No. 5461). The successful collaboration between the public consortium and the private company is being heralded not only for making the genome sequence of the fruit fly, an important model organism, publically available at least a year and a half earlier than the consortium alone could have, but also as a validation of the whole genome shotgun method for sequencing a large and complex genome.



■ Assistant Professor of Biochemistry and Molecular Biology **Kathleen Collins**, graduate student James Mitchell, and former undergraduate Emily Wood have identified for the first time a human disease associated with a telomerase deficiency. This widely reported research was originally published in *Nature* on December 2, 1999 (Vol. 402: 551-555). The rare genetic disease, dyskeratosis congenita, was known to be caused by mutations in the gene encoding dyskerin which, the MCB researchers found, lead to compromised telomerase function. Telomerase is an enzyme required to maintain telomeric simple sequence repeats at the end of chromosomes which are necessary for chromosomal stability. Telomerase activity is required for cells to continue to divide indefinitely because, otherwise, gradual telomere loss would halt cell division. The finding that cells from dyskeratosis congenita patients have less telomerase activity and shorter telomeres may explain why those patients suffer from problems with tissues that must constantly regenerate, such as skin and bone marrow, and why the patients are prone to chromosomal instability and cancer.

■ The use of anti-plagiarism technology by Neurobiology Lecturer **David Presti** was reported by many media outlets including the *New York Times* (January 20, 2000) and *ABC's World News Tonight with Peter Jennings* (October 21, 1999). Last spring, an Internet-based service, Plagiarism.org, compared the term papers from Presti's Molecular Neurobiology course (MCB 165) to millions of web sites and to archives of online term papers. Even though Presti had warned the students, 45 of 320 were found to have plagiarized. Plagiarism.org was conceived and developed by John Barrie, a biophysics graduate student in MCB Professor Walter Freeman's lab. When Barrie was a graduate student instructor for MCB 165, he and Presti pioneered the use of the web as an instructional tool (see *Science* (1996) 274: 371-372).



## Tjian's Gift of Tularik Stock

### to Benefit Department

The MCB Department received a generous gift of Tularik Inc. stock from MCB Professor Robert Tjian, one of the company's founders. The stock was transferred to the department in late 1999 upon the initial public offering of Tularik stock, but Tjian had pledged it to the department in 1992, soon after Tularik was founded. "Right from the very beginning when we first set the company up, (co-founder) Steve McKnight and I felt that we should put money back into our institutions, that was never even a question," said Tjian, who has been on the UC Berkeley faculty since 1979.

Tjian is also a Cal alumnus. He received his A.B. degree in 1971 from the Biochemistry Department, where he began his career in research as an undergraduate in Dan Koshland's lab.

Tjian's lab studies the regulation of eukaryotic gene transcription, and it was this research that sparked the idea for the company. "I had the idea we could make use of

information we had learned about gene regulation to find better classes of therapeutic drugs," said Tjian. "Unlike most other biotech companies that were being formed in the late 80's and early 90s which were based on recombinant DNA methodologies for the product itself—that is to say they were protein-based products—our approach is really in some ways old-fashioned in the sense that we are going after small molecules that would be orally active in pills. However, to find the targets of these drugs, we use the most sophisticated recombinant DNA methodologies."

Over the course of many fly-fishing trips, Tjian discussed his idea for a company with Tularik co-founder and now CEO, Dave Goeddel. Finally, they made the decision to form the company while fishing on the banks of the Tularik River in Alaska, hence the company's name.

Today, Tularik is a publicly traded company with about 200 employees, many of

whom are former UC Berkeley students and postdocs. The company has about 20 potential products in the pipeline with applications against a broad range of human diseases. They include three anti-cancer drugs currently in human trials and one anti-viral drug in preclinical testing.

Tjian is the second MCB professor to donate stock from a biotechnology company he co-founded to his department. Chiron Corporation co-founder Edward Penhoet, currently MCB professor and dean of the School of Public Health, gave Chiron stock to the Biochemistry Department, one of MCB's predecessor departments. "Penhoet's gift now benefits the Biochemistry and Molecular Biology Division," said MCB Co-Chair Randy Schekman. "Of course, new gifts of stock and other assets are for the benefit of the entire department, and Tjian's gift is an invaluable addition to our endowment."

# MESSAGE FROM THE CHAIR



On Saturday, March 25, we celebrated the (not quite) 80th birthday of our true-blue colleague, Dan Koshland. The symposium to mark the occasion was well attended by current and former associates going back over 25 years, well back into the days of the old Biochemistry Department. Keynote lectures were delivered by Koshland friends and Nobel laureates, Joseph Goldstein and David Baltimore, and former Koshland students, Jean Wang, Daria Mochly-Rosen, Alex Levitzki, and Bob Tjian. I am pleased to report that Dan, true to form, took no time off and was back in the lab early Monday morning!

In the months since our last newsletter, we have been gratified to hear from many of you who wish to keep in touch with the department, if only to make sure that we have your latest mailing address. We have included your responses to our alumni survey in this issue (see page 8). Thanks for the interest and input.

This semester has been filled with moves and plans for future building. Barker Hall is now vacant, and shortly, the area around the building will become a staging ground for all the machinery and work crews involved in the seismic retrofit and renovation effort. Barker decantees are being housed in Stanley Hall, LSA, VLSB, Wellman Court, and off campus. This makes for a crowded, but hopefully stimulating, rearrangement of colleagues and students within MCB. At the same time, fundraising efforts are proceeding to support the construction of new buildings (the Health Sciences Initiative) to replace Stanley Hall and Warren Hall during a period of time three to six years down the road.

In the dim dark past, new buildings at this institution were constructed with generous support from the State. However, with the continuing explosion in the number of college-age students in California, resources for new buildings are being diverted to campuses that have space to expand. Even this cannot happen fast enough, and Cal has been asked to absorb an additional 4000 undergraduate students in the next decade. This phenomenon, termed "Tidal Wave II," will impose a tremendous strain on our resources and facilities. As a result, the MCB Department has become increasingly dependent on federal and private resources to build buildings, renovate space, and initiate research programs that bridge research groups within and outside of our unit. In support of these goals, we wish to reach out to our alumni and friends to help us build an endowment for the department. Such an endowment would provide unrestricted funds to support seminars, graduate training, renovation projects, interdisciplinary research, and a host of other unmet needs.

Laura Williams, our founding editor of the MCB Newsletter, will be leaving us at the end of this semester. She and her husband, Craig Fairchild (MCB PhD, 1993), and their daughter will be moving East where Craig has been appointed to a faculty position at Worcester Polytechnic Institute. This is a great opportunity for them, and we wish them all the best. Laura has set a high standard for this Newsletter, and we intend to find a new editor who will keep this valuable forum going.

RANDY SCHEKMAN  
*MCB Co-Chair*

## Drive for Departmental Facilities

**The MCB Department is updating and expanding its research facilities with the goal of making the latest technologies accessible to every member of the department. MCB Assistant Professor of Biochemistry and Molecular Biology Kathleen Collins chaired a committee which considered the status and future of these facilities. “They are so important,” she said. “They are required to do the kind of science that needs to be done.”**

MCB Professor of Biochemistry and Molecular Biology Robert Tjian agrees with Collins. He said, “Biology research has gotten to the point where there are certain types of experiments that you need to do to make your research more effective, and they require instrumentation that few individual labs can afford to have.” Tjian oversees the **protein analytic and synthetic facility** in Koshland Hall. Originally set up with Tjian lab funds, the heavily used facility includes equipment for X-ray crystallography, circular dichroism, peptide synthesis, and mass spectrometry. To help the facility better serve the needs of the entire department, a second mass spectrometer, one with the latest technology, was purchased with funds provided to the department by Executive Vice-Chancellor and Provost Carol Christ. The new mass spectrometer will be run by a trained research specialist to be hired in the near future.

The establishment of a **microarray facility** was described in our Fall, 1998 issue ([mcb.berkeley.edu/news/newsletter.html](http://mcb.berkeley.edu/news/newsletter.html)). Started by a small group of MCB labs, the facility lacks the funding and the space necessary for departmental access. But with demand growing for microarray technology, which is used for monitoring the expression of many genes in parallel, an application was made to the campus for the facility to become an Organized Research Unit. “With at least 50 labs on campus

expressing interest,” said MCB Associate Professor of Neurobiology John Ngai, “we absolutely need backing from the campus.” The proposed “Functional Genomics Laboratory” would have, in addition to a microarray facility, proteomics, bioinformatics, and technology development components.

Currently, a new **light microscope imaging facility** is being set up on the third floor of LSA. The effort is being led by MCB professors Zac Cande and Ehud Isacoff with help from the Cancer Research Laboratory. The equipment acquired so far has been donated by individual investigators or obtained with multi-user grants, and it includes conventional microscopes, a new deconvolution microscope, and a confocal microscope, which is an old model. “We have a shopping list for new items of equipment,” said Cande. They range from expensive items such as a two-photon microscope for imaging living specimens to small but essential items such as dissecting microscopes. “Right now, the state of the department’s imaging technology is far behind the times,” said Isacoff, “but within two years we can be at the leading edge again.”

Continuing to provide the latest technologies in departmental facilities is important for research. “It is necessary for us to stay competitive,” said Tjian, “and it’s a never-ending process. Every year there are new things that are needed. Our research is so dependent on rapid technological advances that, if we want to remain a cutting-edge research university, we would be at a huge disadvantage if we were not aggressively bringing in all these different methods. It’s not just a question of buying new toys; it’s the lifeblood of the research.”

Limited funding for instrumentation is available from the federal government, but it usually comes with a requirement for matching funds. For example, matching funds had to be provided for the new X-ray beamline facility (see page 1). “We have a real need for private funds to be used as matching funds,” said Cande.

# AWARD WINNERS

## OUTSTANDING GSI AWARDS

The following MCB graduate students were named Outstanding Graduate Student Instructors for 1999.



*Sara Agee,  
Weisblat Lab*



*Deepta Bhattacharya,  
Sha Lab*



*Neeraj Chugh,  
Garriga Lab*



*Alexa Franco,  
Kaufman Lab*



*Christine Hardy,  
Cozzarelli Lab*



*Cary Lai,  
Berger & Collins Labs*



*Linda Liang,  
Sha Lab*



*Maureen McGrath,  
Isacoff Lab*



*Jessica Palmer,  
Goodman Lab*



*Guilietta Spudich,  
Marqusee Lab*



*Moriah Szpara,  
Serafini Lab*



*Hera Vlamakis,  
Zusman Lab*



*Herman Yue,  
Skarnes Lab*

## FACULTY AWARDS

- Carlos Bustamante, professor of biochemistry and molecular biology and of physics, and Eva Nogales, assistant professor of biochemistry and molecular biology, were appointed to the Howard Hughes Medical Institute at UC Berkeley.
- Barbara Meyer, professor of genetics and development, was elected to the National Academy of Sciences.
- Nilabh Shastri, associate professor of immunology, is one of three UC Berkeley professors to receive the 2000 Distinguished Teaching Award, the campus's highest honor for teaching. The past recipients of this award from the MCB Department are Jasper Rine in 1997 and Gary Firestone in 1995.

## ALUMNI AWARDS

- David Baker (PhD, 1989) of the University of Washington, Seattle, received the Protein Society's Young Investigator Award for 2000.
- Ray Deshaies (PhD, 1988) of the California Institute of Technology received the first annual American Society for Cell Biology/Promega Early Career Life Scientist Award in 1999.
- Brian Dynlacht (PhD, 1992) of Harvard University received a 1998 Presidential Early Career Award for Scientists and Engineers (PECASE) and also was named a 1998 Pew Scholar.

## UNDERGRADUATE

### AWARDS

*In recognition of outstanding achievements by MCB undergraduates, the following awards will be presented by the MCB Department at the 2000 Undergraduate Commencement. The recipients are graduating seniors except as noted. The name of the professor in whose lab the student performed research is shown in parentheses.*

#### Department Awards

- Hariharan Thangarajah (Forte) receives the MCB Departmental Citation for exceptional achievement in both course work and research.
- Michel DuPage (Cline) receives the MCB Outstanding Scholar Award for highest academic achievement.

#### Division Awards

- Phillip Iaquina (Thorner) receives the BMB Divisional Citation for highest overall achievement in the Biochemistry and Molecular Biology emphasis.
- Leslie Chu (T'jian) receives the Grace Fimognari Memorial Award as an outstanding student in the BMB emphasis.
- Hani Salehi-Had (Nogales) receives the Kazuo Gerald Yanaba & Ting Jung Memorial Fund Prize based on the oral presentation of research at the BMB Undergraduate Honors Research Symposium and the honors thesis.
- Nadia Roan (Alber) receives the F.H. Carpenter Memorial Prize in Biochemistry based on academic achievement in MCB courses and faculty recommendation. This award provides a stipend to support the summer research of a junior MCB major in the BMB emphasis.
- Michelle Lau (Drubin) is named the Outstanding Undergraduate in Genetics and Development based on the oral presentation of research at the G&D Undergraduate Research Symposium and the honors thesis.
- Tania Kaprealian (Shastri) receives the Outstanding Immunologist Award for high academic achievement and quality of research by an undergraduate.

The following students are recipients of I.L. Chaikoff Awards for outstanding achievement and excellence in the Cell and Developmental Biology and Neurobiology emphases.

- Nasrin Amiri (B. Ames)
- Kensho Iwanaga (Moore)
- Brian Kim (Firestone)
- Hariharan Thangarajah (Forte)
- Nadir Yehya (Hayes, IB)
- Sue Yeon Choi (Serafini)
- Joy T. Shen (Goodman)
- Vicky Siau (Breedlove, Psych)

### COMMENCEMENT

This year for the first time, the MCB Department will hold separate commencement ceremonies for undergraduate and graduate students.

The Undergraduate Commencement will take place on Sunday, May 21, 2000, at 2:00 PM at the Hearst Greek Theatre. Edward Penhoet, dean of the School of Public Health and MCB professor of biochemistry and molecular biology, will give the commencement address.

The Graduate Commencement will be on Monday, May 22, 2000, at 1:00 PM at the Zellerbach Playhouse. The commencement address will be given by Zach Hall, the vice-chancellor for Research Affairs at UC San Francisco.

We received the following responses to our alumni survey. The responses are divided into two groups, Undergraduate Alumni and Graduate Alumni, and arranged by degree year. We would like to hear from more of you. Please complete the alumni survey located on the insert between pages 4 and 5 and return it in the attached envelope, or submit your information via e-mail to [william5@uclink4.berkeley.edu](mailto:william5@uclink4.berkeley.edu).

## Undergraduate Alumni

1991

- **Edwina Campbell Lerner**, Postdoctoral Fellow, University of Pittsburgh. Previously, Lerner was a postdoc at Case Western Reserve. She received a Ph.D. in Pharmacology from the University of Pittsburgh in 1997.

1993

- **Nayiri Doudikian Scaff**, Physician-surgery, Huntington (CA) Memorial Hospital.
- **Sampak P. Garg**, Minority Counsel, U.S. House of Representatives Committee on the Judiciary. Garg received a J.D. in 1997 from the George Washington University Law School.

1994

- **Brandy Box**, Resident Physician, UC Davis Medical Center. Box received a M.D. from the University of Southern California in 1999.

1995

- **Marc David Chodos**, medical student in the class of 2000, UCLA School of Medicine. In 1996, Chodos received an American Academy of Allergy, Asthma, and Immunology Summer Fellowship in 1996 and was the only medical student to present at the AAAAI/AAI/CIS joint national meeting in February, 1997.

- **Shanaz Khambatta**, Doctor of Osteopathic Medicine in family medicine residency, St. John Oakland Hospital, Madison Heights, MI. Khambatta graduated from Kirksville College of Osteopathic Medicine, Kirksville, MO, in 1999.

- **Kimberly Poggemeyer**, Epidemiologist, San Bernardino (CA) County Public Health. Poggemeyer received a M.P.H. degree from UC Berkeley in 1997.

- **Kenneth G. Yeung** (a.k.a. Gee-Kin Yeung), Pharmacy Manager, Longs Drug Store, Alameda, CA, and part-time in-patient Pharmacist, San Francisco Veterans Hospital.

1996

- **Anika Karrim**, Associate, Salomon Smith Barney, San Francisco, CA.
- **Juliana Karrim**, second-year medical student, UC Davis.

1997

- **Edward Ko**, graduate student, Department of Physiology, Georgetown University.

1998

- **Kathleen Chang**, first-year medical student, UC San Diego.
- **Jimmy Wang**, dental student in the class of 2003, UCLA School of Dentistry. Wang was previously a systems administrator at NASA Ames Research Center.

## Graduate Alumni

1989

- **James Newell**, Assistant Professor of Pathology, University of Colorado School of Medicine, and Staff Pathologist, Denver Veterans Affairs Medical Center.

- **Rachel Sterne-Marr**, Assistant Professor, Department of Biology, Siena College, Loudonville, NY. Sterne-Marr was previously an instructor at Thomas Jefferson University and before that a postdoc, first at the Scripps Research Institute and then at Merck & Co.

1991

- **Leticia Márquez-Magaña**, Associate Professor, Biology Department, San Francisco State University.

1992

- **Christine Mytelka** (M.A. degree), Actuarial Consultant, Indianapolis, IN. Previously, Mytelka was a high school teacher.

1994

- **Tyler Cutforth**, Postdoctoral Research Associate, Columbia University.
- **Sarah Gaffen**, Assistant Professor, Departments of Oral Biology and Microbiology/Immunology, State University of New York at Buffalo. Until 1999, Gaffen was a postdoc and a staff research investigator at the Gladstone Institute of Virology and Immunology at UC San Francisco.
- **Lisa M. Gloss**, Assistant Professor, School of Molecular Biosciences, Washington State University. Until 1998, Gloss was a postdoc with C. Robert Matthews at Penn State University.

- **Thomas Neufeld**, Assistant Professor, Department of Genetics, Cell Biology, and Development, University of Minnesota. Until 1999, Neufeld was a postdoc at the Fred Hutchinson Cancer Research Center in Seattle, WA.

1995

- **Pao-Tien Chuang**, Assistant Professor, UC San Francisco. Until 1999, Chuang was a postdoc at Harvard University.
- **Daniel Mytelka**, Senior Financial Analyst, Eli Lilly, Indianapolis, IN. Mytelka received a M.B.A. from the University of Chicago in 1999. In 1996 and 1997, he was a patent examiner at the US Patent and Trademark Office.

1996

- **Linda Hammond** (M.A. degree), graduate student, Department of Nutrition, University of North Carolina, Chapel Hill. From 1997 to 1999, Hammond was a research associate in the Department of Molecular Medicine, City of Hope National Medical Center.

1997

- **Daniel Joo**, Bioinformatics Scientist, DoubleTwist Inc., Oakland, CA. Until 1998, Joo was a postdoc at UC San Francisco.

1999

- **Kristin Hendricks**, Postdoctoral Researcher, DNAX Research Institute, Palo Alto, CA.

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