MCB Transcript

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

New Profs Probe Animal Origins and Cell Growth

In the late 1800s, the British marine biologist William Saville-Kent realized he was looking at the origin of multi-celled life. After years of close observation, he had become convinced that sea sponges had evolved directly from colonies of protozoans called choanoflagellates.

He saw that these unicellular plankton dwellers possessed a single long flagellum surrounded by a collar of spindly tentacles that served as a basket for collecting food. The beating flagellum would propel water through the basket, sifting out bacteria and other nutritious particles. What convinced Saville-Kent and others of their importance in animal evolution was their remarkable similarity to collar cells in sponges, which used the same basket mechanism to nourish the sponge.

This link between single-celled and multi-celled creatures remained little more than a just-so story—albeit one repeated in many textbooks—for more than a century, until Nicole King decided to take a closer look. Largely through her efforts, that link has now been experimentally substantiated. And, better still, choanoflagellates have become a window to the past—a new way to study the origin of animals.

King doesn't mind saying that her first attempt to tie single and multi-celled organisms together failed badly. She spent three years as a graduate student scouring protozoan DNA for relatives of homeobox genes, critical determinants of the body plans of animals. She finally gave up and finished

Nicole King

her graduate degree on a different project in another lab.

"It was an important part of the process, because I learned how to do science," she says. "But it also gave me another three years for the idea of choanoflagellates to ferment."

When King began looking for a post-doctoral position, no one yet was working on the comparative genomics of choanoflagellates. But a number of labs were making headway in studying the evolution of development. Sean Carroll, a biologist at the University of Wisconsin who heads one of the best known of these evo-devo groups, took an immediate interest in King's proposal. Over the next few years, they put choanoflagellates back on the map.

Whereas some groups have tried unsuccessfully to locate choanoflagellate homologs of specific animal genes, King has taken a broader approach. She assembled more than

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Watson Headlines Biotech Event

For James Watson, co-solver with Francis Crick of the structure of DNA, 2003 has been one big party. April marked the 50th anniversary of their publication of the double helix in *Nature*, and the year has been one celebration after another. Watson's exuberance was on full display when he headlined an all-day symposium on 11 October in a packed Pauley Ballroom called "The Double Helix and Biotech," organized by Robert Tjian (BMB).

The theme of the symposium, Tjian said in his opening remarks, was the connection between basic and applied molecular biology. "There would be no biotechnology sector without the structure of the double helix, but at the same time, the full implications of the double helix would not have been realized without the biotech industry," he said.

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photo credit: Peg Skorpinski

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5000 messenger RNA molecules from two species of choanoflagellates and discovered that these single-celled organisms make a stunning array of proteins known to help animal cells stick to each other and communicate. These included cadherins (essential for cell to cell attachment), C-type lectins (which recognize cell surface sugars), and tyrosine kinases (for cell to cell signaling).

It turns out that the very proteins cells need to work together in a multicellular organism were already present in their single-celled progenitors. None of these molecules are found in plants and fungi. Choanoflagellates, it is now clear, are the closest living single-celled relatives of sponges, and are certain to hold many enticing secrets to the origin of multi-celled life.

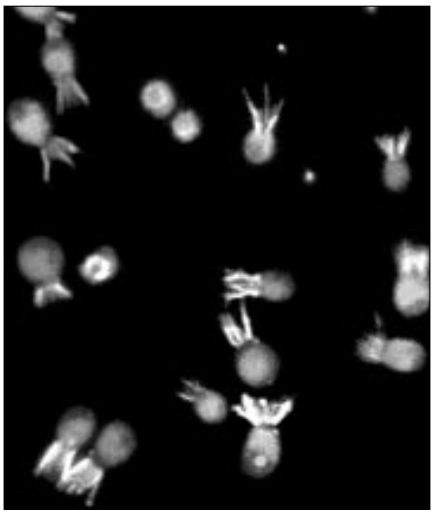
But there is much more work to be done. The Joint Genome Institute in Walnut Creek has begun sequencing one of the two choanoflagellate species King works with. Its genome is on the order of 30 megabases, and King believes that she has sampled only a small portion of its proteome. Very little is known about the life cycle of choanoflagellates. While King grows them in the lab, she has not yet succeeded in synchronizing them, so observations of their behavior are mere snapshots of a life cycle without any clear order. She also believes they reproduce sexually, but this has not yet been observed or proven genetically.

Another key question is what all those adhesion and signaling molecules are doing in single-celled organisms. For adhesion molecules, one possibility is that they provide a sticky surface to help capture bacterial prey. Both signaling and adhesion molecules may facilitate the occasional colonizing behavior of some choanoflagellates. They could also be involved in sex, if sex happens between these protozoans.

So a new graduate student joining King's budding laboratory would be a bit like the proverbial kid in the candy store. He or she could do bioinformatics, study a single molecule, or work on choanoflagellate life cycles, sexual reproduction or natural history. "It's up to the student's interest," King says. "The field is wide open. There is almost no competition."

King says she would like her lab to grow gradually to between 7 and 10 people. It will be located on the fifth floor of LSA, which has been renovated to house the Center for Integrative Genomics (see *MCB Transcript*, Spring 2003). As King and others migrate to Berkeley, the Center seems destined to become one of the world's premier evo-devo research hubs. If only Saville-Kent could visit.

Iswar Hariharan



Group hug: Choanoflagellates have the genes for multicelled life

The Eyes Have It

Every living cell faces a dilemma: to grow or not to grow. A lot depends on the answer. Growth and cell division are essential in the early stages of life—in a developing fruit fly embryo or a human fetus, for example. But the same exuberance in later life can lead to cancer. The debate over which way to go plays out in the cell's interior where, broadly speaking, some protein factors push for proliferation while the others urge restraint.

These restraining factors have captured the interest of the cancer research community because they almost invariably turn out to be damaged in tumor cells. Among the better known growth restrictors is the tumor suppressor p53, which is inactivated in most human cancers.

But damage to p53 alone is not enough to start a cancer, as there are numerous overlapping and even redundant growth restraint pathways in the cell. Most cancerous growths result from a combination of mutations in several growth and proliferation genes. So to understand cancer, it is essential to track down all the regulators of cell growth and find out what they do.

Five years ago, Iswar Hariharan, a professor at Harvard Medical School in Boston, set out to find as many growth and proliferation factors as he could using a clever genetic screen involving fruit fly eyes. He is now sifting through some 40 candidate genes, of which 16 have been isolated and cloned. At least two appear to be related to human tumor suppressor genes.

Hariharan is now bringing the project to Berkeley, where he joined MCB as a full professor in August. In a sense, he is coming home. Hariharan developed his fly expertise as a postdoc in Gerald Rubin's lab eleven years ago.

Cell proliferation genes can be hard to study, because in most cases a mutation in one copy has no effect, while a mutation in both is lethal. So to find these genes in randomly mutagenized flies, Hariharan took advantage of the ability of chromosomes to exchange portions of themselves when a cell divides, a phenomenon known as mitotic recombination. This is normally a rare event, but can be enhanced greatly by adding specific recombination sites to the fly's chromosomes.

In the screen, Hariharan starts with flies that carry both a mutated and a normal copy of a random gene. When mitotic recombination occurs during cell division, one daughter cell ends up with two mutant copies and the other with two normal copies. Hariharan designed the screen so that the doubly mutant clones of cells in the eye would be white, whereas the normal cells would be red.

In most cases, the result is a variegated eye that looks like strawberry swirl ice cream. But if the mutated gene is a growth restrictor, the doubly-mutant white cells should have a growth advantage over their red neighbors. That produces a mostly white eye. In the screen, flies with mainly white eyes probably carry a mutation in a gene involved in restraining cell growth or proliferation.

Three of the genes from the screen are homologues of known human tumor suppressor genes. These are PTEN, which turn up in a number of solid tumors, and the duo TSC1 and TSC2, which can cause benign tumors in a variety of organs.

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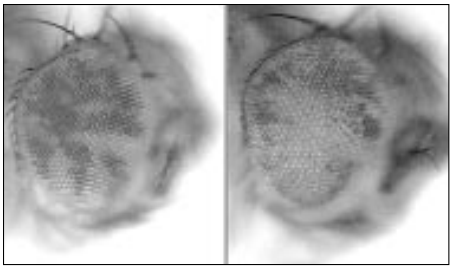
The screen should also prove valuable in identifying new human tumor suppressor genes. For instance, mutations in a gene from the screen called *hippo* cause tissues to overgrow and prevent cells from dying naturally through apoptosis. The Hippo protein turns out to be a missing link in a critical pathway that activates apoptosis in fruit flies (*Cell* **114**, 457-467). Little is known about the two mammalian genes related to *hippo*, Mst1 and Mst2, but Hariharan's group is now investigating whether they may also function as tumor suppressors.

Originally from Australia, Hariharan had trained as a medical doctor at the University of Sydney before earning his Ph.D. in molecular biology from the University of Melbourne in 1989. With that dual training, Hariharan has always felt it was important to help bridge the gap between medicine and basic research.



I spy with my little eyes:
The white patch in the eye on the right is a clone of more rapidly growing cells

When he first arrived at Harvard Med, his was the only fly lab in his building at Massachusetts General Hospital. So he made a concerted effort in seminars and reviews to help physicians get a better handle how basic research can shed light on human disease. "The medical community has only recently started to realize the power of model organisms for going after disease genes," he points out. Now, he is leaving behind seven or eight fly labs in that building, all of which started up in the past decade.

Moving with Hariharan from Boston in March will be four postdocs and two technicians. Although his lab has been as large as ten, for the moment, he says, he is not in a rush to grow back to that size.

But he is very much looking forward to the move. "I wanted to be in a basic science atmosphere again," he says. "I have a lot of respect for the scientists at Berkeley, and I always wanted to come back."

As it happens, the industry got its start in the Bay Area in 1975 when UCSF biologist Herbert Boyer set up the world's first biotechnology company on the basis of the newly emerging recombinant DNA technology. Located in South San Francisco, Genentech has since become a $3 billion company making a variety of biotech products including the cancer drug Herceptin and the heart medicine Activase. Together with the dozens of biotechnology companies that have sprung up around it, Genentech has propelled the Bay Area into it's current position as the world's largest biotechnology hub.

Boyer was also a guest of honor at the symposium, where he took part in a panel discussion with three other biotechnology leaders: David Goeddel, founder and chief executive of Tularik; Edward Penhoet, founder of Chiron Corporation; and Charles Weissmann, founder of Biogen. They fielded questions from the audience of 800 about patents in the life sciences, pharmaceuticals in the third world, and the differences between business and academia.

Watson capped off the day with a speech that featured entertaining and sometimes provocative musings on his career the current state of science. He said, for instance, that he welcomed an era of genetic enhancements in which a poor genetic inheritance could be corrected.

That day will come, he said, but people must begin to think more about how genomics can get us there. He urged scientists and funding agencies to move faster to capitalize on the genome. "Most people don't know what we have, they're going around doing science as before, until someone shows them what to do with it," Watson said.

photo credit: Peg Skorpinski

Gung-ho: Bring me 50,000 genomes by morning

Watson proposed a massive effort to sequence the genomes of tens of thousands of people. From that volume of data would certainly come insights into the genetic basis of multi-gene traits like handedness or even baggy eyelids, he said. Humans will be the model organism of this century, Watson predicted. "The impact of the human genome project will be every bit as important as the double helix."

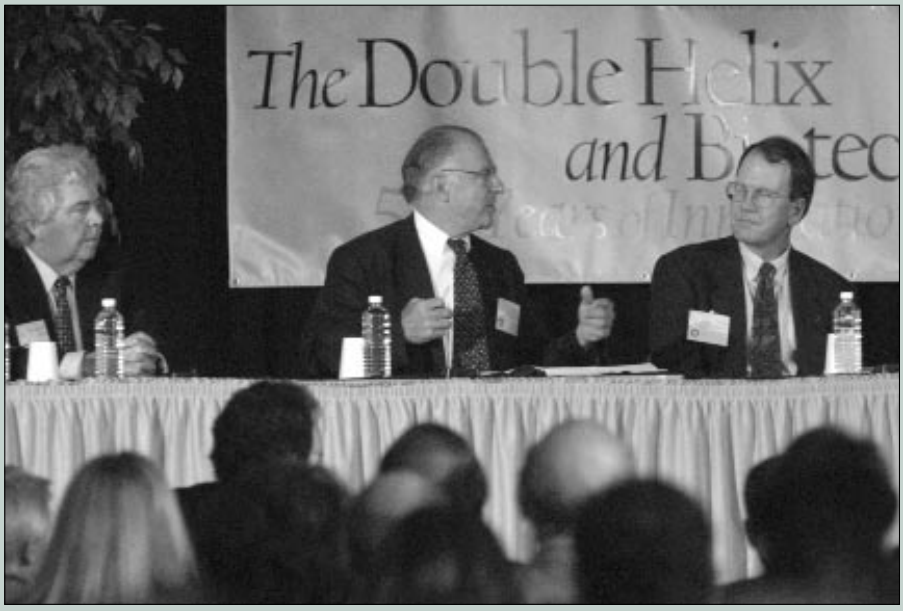


photo credit: Peg Skorpinski

Boyer, Weissmann, Goeddel: I'll handle this one

Alison Departs

Jim Allison, longtime Professor of Immunology, has decided to accept the position of Chair of Immunology at Memorial Sloan Kettering Cancer Center in New York. Allison says it was an extraordinarily difficult decision to leave Berkeley after 20 years. But the move is not necessarily permanent, he says. He hopes instead to make it a leave of absence. The following is a letter he sent to friends and colleagues in the department explaining the decision.

Dear friends and colleagues,

As many of you know, I have been offered the position of Chair of Immunology at Memorial Sloan Kettering Cancer Center. After more than a year of considering it, and considerable soul searching, I have decided to accept the offer. This has not been an easy decision for me. My almost 20 years at Berkeley have been a delight, both professionally and personally.

Marian and Dan Koshland, and Bob Tjian recruited me to Berkeley in 1984 and charged me with building a group in Immunology and reshaping the Cancer Research Lab. Over the years and with the help of many, including especially David Raulet, the Division of Immunology has become one of the best immunology groups in the world. It is especially, and often jealously, recognized for the collegiality and high level of interaction of its
faculty and fellows. And with the help of many faculty, including especially Astar Winoto, Vice Chancellor Beth Burnside, and MCB Vice Chair Mark Schlissel and the staff, especially Carol Slatten, the CRL has continued to evolve and be a critical source of core support for sophisticated biomedical research technologies despite the challenge of repeated cuts in levels of state support,

It is of course very clear to me that whatever success my own research program has had can be attributed to excellence of the students and postdocs that Berkeley attracts, and to my Immunology colleagues and their lab members, especially Bill Sha, Astar Winoto, Nilabh Shastri, and Ellen Robey, who have helped my students and fellows. I doubt that there is a more collegial and nurturing atmosphere anywhere, and I will miss it.

Berkeley has been very good to me, I treasure my time here and leave reluctantly.

However, I have always been interested in clinical application of basic immunology. The past few years have led to insights into mechanisms of regulation of immunological responses that provide an unprecedented opportunity for the development of novel and rational strategies for immunological therapies of disease, especially cancer. The time is ripe, and the next few years will tell the story. The opportunity to assemble a team to aggressively and efficiently pursue the goal of translation of basic immunology into novel treatments for cancer is what leads me to move to MSKCC. It is an opportunity that I feel that I cannot pass up.

I will leave Berkeley next summer with some regret, and I hope that you will wish me well on this new endeavor.

Jim Allison

Bruce Ames (Professor of the Graduate School) was appointed to the President's Committee on the National Medal of Science. He received the medal himself in 1998.

Carolyn Bertozzi (Chemistry and BMB) was elected to the American Academy of Arts and Sciences.

▲ **Carlos Bustamante** (BMB and Physics) will receive the founder's award from the Biophysics Society on February 16 in Baltimore at the society's annual meeting for his pioneering role in single-molecule biophysics.

Thomas Cline (G&D) was elected a Fellow of the American Association for the Advancement of Science. He was also elected to the Board of Directors of the Genetics Society of America.

▲ **John Forte** (CDB) received the Horace W. Davenport award and lectureship of the American Physiological Society for distinguished research in gastrointestinal and liver physiology. He will give the lecture at the Spring 2004 Experimental Biology meeting in Washington, DC.

Donald Glaser (Professor of the Graduate School) was elected to the American Academy of Arts and Sciences. He also gave the keynote address at the International Symposium of the Mariani Foundation for Pediatric Neurology on October 20 in Milan. His topic: "How does the brain enable us to see? Perception of visual motion and depth."

▲ **John Ngai** (Neuro) was appointed to the National Deafness and Other Communication Disorders Advisory Council at the National Institutes of Health. The council advises the director of the institute on funding priorities and long-range planning.

Eva Nogales (BMB) was awarded tenure in July. She also became a member of the Executive Board of the Biophysical Society.

▲ **David Raulet** (Immuno) was elected a Fellow of the American Association for the Advancement of Science.

Jasper Rine (G&D) was elected a Fellow of the American Association for the Advancement of Science.

Jeremy Thorner (BMB) was appointed an Editor of Molecular and Cellular Biology, published by the American Society for Microbiology

Eileen Bell, Head of the Graduate Affairs Office, was among the 31 recipients of the 2003 Chancellor's Outstanding Staff Award, the highest honor bestowed upon staff by the Chancellor. The awards ceremony was held on November 3 in the Alumni House. http://csac.chance.berkeley.edu/COSA_descrptn.html

Correction

The announcement in the Spring 2003 Transcript of Iain Cheeseman's Harold M. Weintraub Graduate Student Award got his lab affiliation wrong. Cheeseman was in Georjana Barnes' lab. He has since gone on to a postdoc at the Ludwig Institute for Cancer Research in San Diego.

MCB Transcript

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

2002–2003 Graduates

Fall 2002

- **Marios Andreou** (Firestone) Role of Serum - and Glucocorticoid-Regulated Kinase on Nuclear Processes and Cell Function (MA)
- **Brian Avery** (Rubin) Signaling Downstream of Low Density Lipoprotein Receptor-Related Proteins
- **Priya Budde** (Heald) Regulation of Spindle Assembly in *Xenopus* Egg Extracts
- **Michelle Burbea** (Kaplan) Genetic Regulation of the Abundance of the Glutamate Receptor GLR-1 at Central Synapses in the Nematode *Caenorhabditis elegans*
- **Iain Cheeseman** (Barnes) Roles for the Dam1 Complex in Mitotic Spindle Integrity and Kinetochore Function in *Saccharomyces cerevisiae*
- **John Cowden** (Levine) Subdivision of the *Drosophila melanogaster* Neuroectoderm by the Dorsal Nuclear Concentration Gradient
- **Joseph Duman** (Forte) Structure and Function of Exocytic H+,K+-ATPase-containing Membranes From Gastric Parietal Cells
- **Jackson Egen** (Allison) CTLA-4 Localization and Trafficking in T cells
- **Yick Fong** (Zhou) P-TEFb and Associated RNPs in HIV Transcription and Coupled Pre-mRNA Splicing
- **Ian Glomski** (Portnoy) The Intracellular Life of *Listeria monocytogenes*: A Good Reason to Stay Inside
- **Aubree Gordon** (Welch) Role of Diaphanous in Actin Polymerization (MA)
- **Hailan Hu** (Goodman) Analysis of the Role of the Plexin Receptor and the Rho Family GTPase Regulators in Axon Guidance in the Embryonic Central Nervous System of *Drosophila melanogaster*
- **Tija Jacob** (Kaplan) Neuropeptide Modulation of *Caenorhabditis elegans* Behavior
- **Erica Kratz** (Ngai) Elucidating the Transcriptional Regulation of Zebrafish Odorant Receptor Genes
- **Brian Krechman** (Martin) (MA)
- **Meredith Leong** (Firestone) Regulation of the Serum and Glucocorticoid Inducible Protein Kinase, Sgk, in Response to Multiple Stimuli and its Role in Cell Survival
- **Percy Luu** (Ngai) Structure-Function Analysis of an Ordorant Receptor
- **David Madden** (Schekman) COPII: GTPase Activity, Dynamics, and Sec16p Regulation of Coat Subunit Assembly
- **Jason McEwen** (Kaplan) (MA)
- **Maureen McGrath** (Isacoff) Gating Rearrangements in Delayed Rectifier Potassium Channels as Measured by Fluorescence
- **Avital Rodal** (Drubin) Actin-Associated Structures and Activities at the *Saccharomyces cerevisiae* Cell Cortex
- **Steven Rothman** (Kirsch) Directed Evolution Applied to Investigations of Substrate Specificity Determinants in the Aminotransferase Framework
- **Kathryn Schubert** (Marqusee) (MA)
- **Christopher Seidel** (Kane) Characterization of *Saccharomyces cerevisiae* Transcription Elongation Factor TFIIS by DNA Microarray and Two-hybrid Analysis
- **Judith Sharp** (Kaufman) Chromatin Assembly Factors and the Integrity of Centromeric Chromatin in *Saccharomyces cerevisiae*
- **Victoria Stone** (Portnoy) The Role of Eukarotic Ena/VASP Proteins In *Listeria monocytogenes* Actin-Based Motility and Pathogenesis
- **Sarah Tegen** (Martin) Characterization of c-Myc Function in Cellular Transformation by the Oncogenic Tyrosine Kinase v-Src
- **Michael Urban** (Amacher) The Role of Two Linked *hairy/Enhancer of split*-Related Zebrafish Genes, *her1* and *her7*, in Segmentation of the Paraxial Mesoderm
- **William Vinje** (Gallant) Promoting an Efficient Sparse Representation in Area VI: A New Role for the Non-classical Receptive Field
- **Defne Yarar** (Welch) Dissecting the Mechanism of Actin-Based Motility Mediated by WASP-Family Proteins
- **Joseph Ziegelbauer** (Tjian) Establishing a Connection Between Microtubules and Transcription

Spring 2003

- **David Astling** (Zusman) Novel Regulatory Mechanisms of a Chemotaxis Pathway in the Gliding Bacterium *Myxococcus xanthus*
- **Rebecca Berdeaux** (Martin) Regulation of Transformation and Signaling by Src and Ras
- **Kimberly Best** (Isacoff) An Optical Study of K+ Channel Inactivation: Modulation by Balls and Beta Subunits
- **Vincent Calhoun** (Levine) Regulation of Enhancer-promoter Specificity in the Drosophila Antennapedia Complex
- **Gretchen Diehl** (Winoto) Apoptotic and Non-apoptotic Functions for FADD and the TRAIL receptor
- **Carl Frank** (Garriga) Genes that Affect *C. elegans* Neuroblast Divisions
- **Chris Gandhi** (Isacoff) Progress Towards an Understanding of Voltage-Sensing in Ion Channels
- **Kevin Hybiske** (Machen) Interactions between *Pseudomonas aeruginosa* and Airway Epithelia in Cystic Fibrosis
- **Amanda Jamieson** (Raulet) The Role of the Stimulatory Immunoreceptor, NKG2D in the Immune Response to Tumors and Infectious Disease
- **Dilnawaz Kapadia** (Allison) PD-1 and the Attenuation of T Cell Responses
- **John Kehoe** (Bertozzi) New Tools for Studying Tyrosine Sulfation
- **Elizabeth Kitchens** (Robey) The Role of Numb in T cell Development
- **Tina Lai** (Garriga) VAB-8 and UNC-51 Interactions Mediate Posteriorly Directed Axon Outgrowth in *C. elegans*
- **Karen Liu** (Harland) Novel Molecular Regulators of Neural Development
- **David Nierengarte** (Bertozzi) New Approaches to Generating Semi-Synthetic Post-translationally Modified Proteins
- **Bridget O'Keeffe** (Firestone) Characterization of Sgk Localization to Mitochondria / Characterization of the Assembly and Regulation of the P-TEFb Cdk9-Cyclin T1 Heterodimer
- **Lisa Postow** (Cozzarelli) Local and Global Views of a Replicating Bacterial Chromosome
- **Jennifer Powell** (Meyer) Chromosome Counting Signals that Determine *Caenorhabditis elegans* sex
- **Zachary Pursell** (Linn) Human DNA Polymerase Epsilon: Subunit Structure and Interaction during Replication with DNA Polymerase Delta and Chromatin Accessibility Complex
- **Srebrenka Robic** (Marqusee) Investigation of Factors Contributing to Thermodynamic Differences Between Thermophilic and Mesophilic Ribonucleases H
- **Jodi Rymer** (Miller) Calcium Signaling and Physiology of Two Epithelia: the Retinal Pigment Epithelium and Mammary Epithelium
- **Ching Shang** (Drubin) A Structural and Functional Study of the Yeast Spindle and Kinetochore-Associated Dam1 Complex
- **Salvador Tarun Jr.** (Sachs) Biochemical Studies of Poly(A)-Binding Protein - Ribosome Interactions in *Saccharomyces cerevisiae*
- **Sarah Wignall** (Heald) Identification and Characterization of Proteins Involved in Spindle Assembly in *Xenopus* Egg Extracts
- **Lianna Wong** (Garriga) Integrins and Cadherins in Cell and Growth Cone Migrations
- **Stephanie Yonker** (Meyer) Molecular Characterization of the Dosage Compensation Protein DPY-21

CLASS NOTES

After graduating, **Shirish Balachandra** (BA 1996) spent more than two years in Cameroon as a community health educator with the Peace Corps. He is now a fourth-year medical student at McGill University in Montreal. Balachandra says he and his wife, a certified nurse-midwife, are enjoying country living with their two dogs in northern Vermont. E-mail: shirish@nameplanet.com

Lois Shiow Balster (BA 1995) got her MD from Ohio State University in 1999. After completing a three-year pediatric residency, she joined the OSU staff in 2002 as a Clinical Assistant Professor of Pediatrics at the College of Medicine and Columbus Children's Hospital. She and her husband Doug, a 2002 graduate of OSU's MD/PhD program, are the proud parents of Benjamin, 2. She says he's a "future Cal Bear who has already been to the top of the Campanile!" E-mail: lbalster@columbus.rr.com

Apurva H. Dave (BA 2000) has entered the PhD program in synthetic organic chemistry at the University of Chicago. After graduating from Cal, Dave worked in an infectious diseases laboratory at Children's Hospital Oakland Research Institute while continuing as a teaching assistant in organic chemistry Berkeley, for which he received the Outstanding Graduate Student Instructor Award in Chemistry. He also fulfilled a childhood dream by earning his pilot's license. Dave is now an FAA-certified Instrument-Rated Multiengine Pilot, which, he says, "comes in handy when trying to land through the thick San Francisco fog next to a 737." E-mail: apurnicus@hotmail.com

Sarah Gaffen (PhD 1994) is an assistant professor in the departments of Oral Biology and Microbiology & Immunology at the University at Buffalo in the State University of New York system. The funding picture looks good for Gaffen at the momet. She received a "Hulda Irene Duggan" Arthritis Investigator award in 2001 (meaning her grant from the Arthritis Foundation scored in the top four), and she has a five-year grant from the National Institute of Allergy and Infectious Diseases. E-mail: sgaffen@buffalo.edu

Jordan Karlitz (BA 1994) earned an MD at McGill University in 2000 and went on to complete training in internal medicine at Columbia University College of Physicians and Surgeons in 2003. Karlitz is now doing a gastroenterology fellowship at Albert Einstein College of Medicine's Montefiore Medical Center. E-mail jk1236@columbia.edu

Daniel Jae Kim (BA 1997) points out that he's been in school all his life. After Berkeley he got an MA in intercultural studies from Biola University, and MS in evaluative clinical sciences from Dartmouth College, and finally this year he earned his MD from Loma Linda University School of Medicine. Kim is now doing a residency in internal medicine at Olive View-UCLA Medical Center. His email address is available through @Cal (alum.berkeley.edu)

CLASS NOTES WANTS TO HEAR FROM YOU

Do you have a Bachelor's, Master's or PhD in Molecular and Cell Biology from Berkeley? Let your classmates know what you are up to by sending in a Class Note for the next issue.

To send your Class Note, you can either

- ➜ Clip and mail this form
  or
- ➜ go to mcb.berkeley.edu/alumni/survey.html

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Fixing a Hole

A trench the size of Memorial Stadium has opened up on the east side of campus where Stanley Hall used to be. Excavation crews have been at work since May digging the hole into which the foundation of the $162 million Stanley Biosciences and Bioengineering Facility will go. With its 11 floors, including three below ground, the new Stanley will help spark a bioscience revolution in California.

Gray Davis, who was California's governor at the time, removed one of the first shovelfuls of earth along with Chancellor Robert Berdahl and UC President Richard Atkinson at the groundbreaking ceremony on May 30. In his speech beforehand, Davis called the new facility a "field of dreams" for the health sciences, referring to the 1989 baseball film. "Build it and they will come," he said.

Some already have. Recent hires in MCB and other departments have cited the building as a factor in their decision to come to Berkeley. That's because the new Stanley will be much more than lab space. When completed in 2006, the 285,000 square-foot facility will be a center of interdisciplinary research and teaching in biology, chemistry, physics and engineering. It will primarily house researchers affiliated with the California Institute for Quantitative Biomedical Research (QB3), but there will also be a number of members of CITRIS—the Center for Information Technology Research in the Interest of Society—an interdisciplinary group with a technology focus.

The building is designed to spark new collaborations among traditionally separate fields of study, based on the principle that the most productive interactions are often spontaneous. They come from chance meetings in the hallway, chats in the coffee room, or from attending seminars and group meetings in other fields that one might not bother to tramp across campus for.

Of course, the new Stanley will also house the most up-to-date equipment available. In July, National Institutes of Health awarded the university $5.9 million to purchase the most powerful magnet on the market for studying protein structure. The 900 Megahertz nuclear magnetic resonance spectrometer, which will be installed in the basement, will be one of only a handful in its class in the world.

In his speech, Davis likened California's initiatives in the health sciences, of which QB3 is the core, to the creation of Silicon Valley. The idea, Davis said, is to replicate in biomedicine the circumstances that sparked the computer technology revolution. "I myself am not going to discover a cure for AIDS, cancer, or Alzheimer's," he said. "But I am determined to create and support a world-class environment in which scientists will make those discoveries."

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