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PRESIDENT'S Column

Diversity in Science: Lots of Rhetoric, Many Plans, Not Much Progress

We are in a period of tremendous scientific opportunity. Fundamental pathways that control cell growth, cell death, cell movement, and cell information transfer are appreciated. Genome sequences are readily available. Technologies such as microarray and proteomics allow us to obtain molecular fingerprints that report cell properties and predict behaviors. Imaging approaches provide glimpses of cell life never before possible. Technologies for engineering cells and tissues are developing. We understand the causes of many human diseases, and improved treatments based on new scientific knowledge are being developed. A question that would have been intractable ten years ago, such as why only a small number of cancer patients receive therapeutic benefit from a particular drug, can now be understood at the molecular level. This enables therapy to be tailored to an individual patient and marks the beginning of personalized medicine (e.g., Lynch et al. 2004).

Mary Beckerle

To capitalize on recent investments in research to improve human health, we need to sustain a high level of scientific activity. This will take resources, both financial and human. I will discuss the financial issues at another time. For now I wish to focus on the issues related to human resources, in particular, diversity in the scientific community.

Enhancing Diversity Is the Right Thing To Do

Why should we care about promoting diversity in our institutions of education and scientific research? Well, first of all, it is clearly the right thing to do. Individuals of each race, ethnicity, and gender need to have equal opportunity to participate in the scientific enterprise. Rich, stimulating, fulfilling careers in science must be available to all with potential. Science needs the brightest, most innovative, creative, energetic and dedicated minds. Those will come in all colors, creeds, and genders. As a society, we need to develop our human capital and access the depth and breadth of our talent pool.

Individuals of each race, ethnicity, and gender need to have equal opportunity to participate in the scientific enterprise.

Training of diverse students in science is critical to building an informed citizenry prepared for future decision-making and broad debate. As scientific discoveries impact society and human health more and more, scientific issues are increasingly in the political foreground. We need a scientifically astute population to weigh in on issues that affect us all. These include stem cell research, health care access, NIH funding, immunizations and preventive medicine, global health, genetic information and insurability, and education.

A focus on diversity is good practice for promoting understanding and acceptance among people. This is clearly beneficial to society. A recent survey of students graduating from high school in Cambridge, MA, with a very diverse student body (30% White, 18% Black, 10% Latino, 4% Asian, 10% Multiracial, 14% other, 14% unidentified), provided evidence that diversity in an educational setting is beneficial (Kurlaender and Yun, 2002). A substantial majority of these students reported that they had increased understanding of different points of view and were likely to seek out interactions with individuals of different backgrounds in the future. These young students will be well prepared for the future, where diversity will rule and where the U.S. will have a "majority minority" population. Indeed, non-Whites are already the majority in Hawaii, New Mexico,

California, and Texas. Projections based on the 2000 U.S. Census suggest that Hispanics will be the ethnic majority in the entire country by 2050.

Enhancing Diversity Is Essential for the Future of Science

Our scientific workforce is aging, with half of all professional scientists over 40. At a time when the scientific enterprise should be exploding based on its potential economic and social impact, the number of students completing undergraduate degrees in science is relatively stagnant at 31%. This seems like a relatively robust number at face value, but consider the trend in China where 60% of all bachelor's degrees are in science (Jackson, 2005).

Diversity now is necessary to assure that there will be sufficient scientists to capitalize on the strong research foundation already established. Potential scientists of the future are students in our elementary schools, high schools, colleges and universities today. If young people don't see anyone like themselves on the faculty or in leadership roles within their institution, they may reasonably wonder why. They may assume that our profession is not open to them—perhaps as Harvard President Larry Summers has wrongly implied, they will conclude that lack of representation means lack of innate ability in science (Lawler, 2005). Members of underrepresented groups may feel discouraged at best, unwelcome at worst. They will simply gravitate toward other subjects and professional opportunities where they can more readily envision themselves in the workforce.

The impact of role models is well established. Young women who have attended women's colleges are two to three times more likely to be awarded advanced degrees than their counterparts from co-educational institutions. Similarly, among Black women who completed doctoral training in biology in the 1980s, more than 75% attended historically Black colleges, in particular Black women's colleges (Trower and Chait, 2002).

Diversity in Science Is Profoundly Lagging Behind Population Demographics

In 2050, when they are part of the majority ethnic group in the U.S., will young Hispanic college students see Hispanic faculty who will be their role models and provide evidence that they could succeed? Not if things don't change pretty dramatically in the coming years. Hispanic, like Black, biology professors are sorely lacking in numbers. And the same holds true for American Indians, Asians and Alaska natives. An analysis of race/ethnicity of tenure track faculty in a cohort of "Top 50" Departments of Biological Sciences, rank ordered based on biology research expenditures, revealed that in 2002, 89% of faculty were White, with only 1% Black, 2% Hispanic, 8% Asian, and <1% Native American (Nelson, 2002). I haven't noticed much change since then. In contrast, the 2000 U.S. Census reports an American population that is 75% White, 12% Black, 12% Hispanic, 4% Asian, and 1% American Indian/Alaska Native. Thus, on a population basis, Blacks, Hispanics, and American Indians are significantly underrepresented in Biology faculty. If one considers that nearly 15% of life scientists are Asian, this group is also underrepresented among Biology faculty. Moreover, a recent commentary highlighted that Asian scientists are surprisingly few on editorial boards and in scientific leadership roles (Mervis, 2005), highlighting a "leaky pipeline" in the professional development of this group of scientists.

Our scientific workforce is aging, with half of all professional scientists over 40.

What about gender diversity? Women represent 51% of the U.S. population. Despite the clear evidence that young women are excelling in science at the undergraduate level and are electing advanced training in science proportional to their numbers in the population, only 20% of the faculty in the 50 Biological Sciences Departments cited above are women. The situation is even worse in the physical sciences and engineering.

Members of underrepresented groups may feel discouraged at best, unwelcome at worst.

A recent (2004-2005) analysis of women in U.S. academic medicine provides compelling evidence that, although women are being trained to assume roles in the medical profession, many drop out along the way. Moreover, very few achieve influential leadership positions. Fifty percent of applicants to medical school are women, and women represent 49% of first-year medical students. However, at each subsequent stage

of professional development, the percentage of women declines. Already at medical school graduation, only 47% of the graduates are female. Only 42% of residents and fellows are female. Women represent 38% of assistant professors, 27% of associate professors, 15% of full professors, and only 11% of department chairs at U.S. medical schools. This curve is rapidly approaching zero.

The end result is the same for women and racial/ethnic minorities: significant underrepresentation in faculty and leadership roles in science. And these slots are key for engaging the next generation of women and minorities. There is one important difference, however. For women, there is a pipeline—leaky to be sure—but a pipeline nonetheless. For racial/ethnic minorities, particularly Blacks, Hispanics, and Native Americans, there is a very limited pipeline.

What Is To Be Done?

Achieving full participation in science clearly requires an adequate pipeline. Development of the pipeline is critical for racial and ethnic minorities. According to a recent report published in Science (Mervis, 2006), only 7.3% of the Ph.D.s awarded in the biological sciences in 2003 went to underrepresented minorities (Black, Hispanics, and Native Americans), even though they are 25% of the general population. Minorities are only minimally in evidence among our science trainees, so even modest attrition has a devastating impact.

Women are numerous in graduate and medical training programs, but this has not yet resulted in adequate representation at more senior levels. A recent analysis (Handelsman et al., 2005) suggests that the often-harsh climate in academia, unconscious bias, and difficulties balancing family and work contribute significantly to the departure of talented women from scientific careers. While these challenges could theoretically affect anyone who enters the scientific profession, they clearly have the greatest impact on women and minorities. Perhaps those who succeed find mentors and supportive voices to show them the way.

Scientific and technological advances have fueled economic growth and improved the health and welfare of the human race. The scientific discoveries of today will result in the cures of tomorrow. We all need to work in our home institutions to insure that the opportunities to participate in science are available to diverse constituents at all levels. We need to act now so that students will readily see individuals like themselves succeeding in our profession. In my next President's column, I will continue this discussion to consider strategies for enhancing diversity in science. ■

Comments are welcome and should be sent to president@ascb.org.

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Stearns Appointed Chair of Education Committee


Tim Stearns

ASCB President Mary Beckerle announced that Tim Stearns of Stanford University will succeed Kenneth Miller as chair of the ASCB Education Committee. Miller, whose term as chair expired in 2005, will continue to serve as a Committee member.

Stearns is acknowledged for his scientific contributions and demonstrated commitment to education. He is the recipient of an HHMI Professor award, and responsible for promoting a pre-grad (akin to pre-med) undergraduate program at Stanford University.

The ASCB Education Committee plans a variety of Annual Meeting events, including the Education Workshop, the annual K–12 Science Education Partnership Lunch, three Education Initiative Forums, the Bruce Alberts Award presentation, a reception for undergraduate students, and the Education/Minorities Affairs Committee Booth.

This year, the Committee plans to reorganize the undergraduate reception to include a poster display and will also help publicize the ASCB Image and Video Library at various education conferences during the year.

For more information about ASCB Education Committee activities and members, see www.ascb.org/committees/edcom/index.html. ■

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Speakers for each minisymposium will be selected by the co-chairs from submitted abstracts for each session. More information and submission at www.ascb.org.

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Eileen White, Rutgers University
Junying Yuan, Harvard Medical School

Applications of Biosensors
Atsushi Miyawaki, RIKEN Brain Science Institute
Alice Ting, Massachusetts Institute of Technology

Cancer Mechanisms
Lisa Maria Coussens, University of California, San Francisco
Mary J.C. Hendrix, Children's Memorial Research Center/ Northwestern University Feinberg School of Medicine

Cell Cycle
Mary Dasso, National Institute for Child Health & Human Development/NIH
Jonathon Pines, The Wellcome Trust/CancerResearch UK

Cell Migration
Diane Barber, University of California, San Francisco
Gregg Gunderson, Columbia University College of Physicians & Surgeons

Computational Applications in Cell Biology
Douglas A. Lauffenberger, Massachusetts Institute of Technology
Alex Mogilner, University of California, Davis

Cytoskeleton, Adhesion and Disease
Kathleen J. Green, Northwestern University Feinberg School of Medicine
Alpha S.K. Yap, University of Queensland

ECM and Cell Signaling
Jean E. Schwarzbauer, Princeton University
Christopher Turner, SUNY Upstate Medical University

Endo- and Exocytosis
Todd Graham, Vanderbilt University
Margaret Scott Robinson, CIMB/The Wellcome Trust

Epigenetics and Chromatin Remodeling
Peggy Farnham, University of California, Davis
Andrew Feinberg, Johns Hopkins University

Epithelial Organization and Morphogenesis
Andrea I. McClatchey, Massachusetts General Hospital
Ulrich Tepass, University of Toronto

GTPases in Cellular Traffic
Francis Barr, Max-Planck Institute of Biochemistry
Shou-ou Shan, California Institute of Technology

Host Pathogen Interactions
Jorge Galan, Yale University School of Medicine
Francoise Gisou Van Der Goot, University of Geneva Medical School

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J. Richard McIntosh, University of Colorado
Eva Nogales, University of California, Berkeley/HHMI

Immune Cell Adhesion and Recognition
Andrey Shaw, Washington University School of Medicine
Colin Watts, University of Dundee

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Don Cleveland, University of California, San Diego
Colin Stewart, National Cancer Institute/NIH

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Michel L.F. Bornens, Institute Curie, Paris
Peter T. Stukenberg, University of Virginia School of Medicine

Life at the Microtubule Plus End
Anna Akhmanova, Erasmus University
Kevin Vaughan, University of Notre Dame

Mechanisms of Actin Dynamics
Bruce Lane Goode, Brandeis University
Dorit Hanein, The Burnham Institute

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Esteban Carlos Dell-Angelica, University of California, Los Angeles School of Medicine
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Anne J. Ridley, Ludwig Institute for Cancer Research

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Roy Parker, University of Arizona/HHMI

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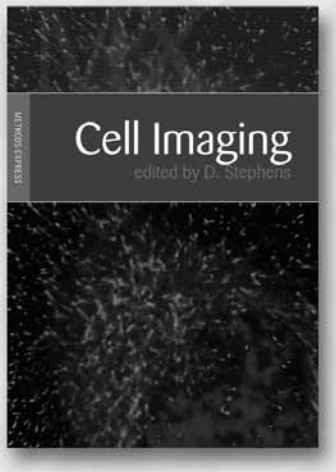

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Edited by David Stephens, *University of Bristol, UK*

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CONTENTS:

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12. Homo-FRET measurements to investigate molecular scale organization of proteins in living cells *Varma (New York, USA) & Mayor (Bangalore, India)*
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DEAR Labby

Dear Labby:

I am a "career" research assistant, and have worked in an excellent, happy lab for the past 14 years. I am an expert on constructing transgenic mice and analyzing transgene expression at both the mRNA and protein levels in early embryos, the fetus, pups and adult progeny. Some of the genes we are studying influence vascularization and angiogenesis, and I recently took a graduate course on the developmental biology of blood vessel formation. This has added to my work enjoyment. I am compensated well (presently $68,500/year) for my years of experience, current expertise and contributions.

All sounds well in my lab life, and it is pretty much. However, recently something slightly disconcerting happened. A friend of mine who works at another institution attended a seminar given by my PI. My friend said that my boss ended her talk with an acknowledgment slide listing several postdocs and graduate students who contributed to the work. I had always assumed that she listed me on acknowledgment slides, as I consider my role to be far above that of a standard technician (I am always listed in the acknowledgments section of our publications). I have trained most of the acknowledged postdocs and students in mouse transgenics, teaching some how to recognize angiogenesis and damage-induced collateral vessel formation, etc. I also think I could stand up and give a decent talk on our work to an audience of my peers.

Perhaps this query comes across as carping and vain, but I am just seeking your advice on the general policy that prevails … or should prevail.

— Not Totally Unhappy Research Assistant

Dear Not Totally Unhappy:

The general policy that prevails is that, unfortunately, there is no general policy that prevails. It is evident from your vivid (and, incidentally, well written) description that you not only possess a sound understanding of the work, but that your contributions rise to a high level of deserved recognition. Labby attends many seminars and notices that lab members of your status are not acknowledged as often as they should be. Speakers are always saying, "Mary Brown, a very talented postdoc in the lab," or "Jin Huang, an unusually gifted graduate student."

You didn't mention coauthorship and Labby would be curious to know if you have been invited to coauthor a paper. Although policies on coauthorship vary, many research assistants with your degree of knowledge and experience who play an essential role in the work are granted coauthorship.

You describe the lab as "happy," and it sounds like you enjoy a good relationship with your lab head, built up over a 14-year period. Rather than mentioning your friend's report on the seminar, perhaps you could just refer to acknowledgment slides you see in seminars at your institution, and raise the question from that angle. It seems quite possible that your omission from her acknowledgment slide is unintended, and Labby suspects both of you are going to feel terrific once this is aired. ■

—Labby

Direct your questions to labby@ascb.org. Authors of questions chosen for publication may indicate whether or not they wish to be identified. Submissions may be edited for space and style.

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Delivering an Effective Scientific Lecture

An effective presentation begins in the planning stages.

Oral presentation of research is one of the most important and sometimes feared aspects of a scientific life. Most young scholars have ample opportunity to make presentations in small or private settings, such as at group meetings and department retreats. As one builds a career, the occasions for such presentations in seminars and national meetings become even more important. Although many mentors stress the principles of an effective presentation, it remains a mystery why so many prominent investigators perform poorly in this regard. Unfortunately, it is quite rare for a one-hour lecture to hold the attention of an audience and to impart a limited and memorable conclusion. One principle that many speakers fail to embrace is the importance of empathy for the audience. The job of a public speaker, at least in science, is to inform interested people from other fields and not simply to impress competitors. The few real experts in any given audience are not the ones to address; the target should be those who come to learn something new and not those who have heard the subject over and over.

The job of a public speaker, at least in science, is to inform interested people from other fields and not simply to impress competitors.

An effective presentation begins in the planning stages. Many speakers attempt to stuff far too much into a seminar. Even an hour seminar should focus on one theme or perhaps two closely related ideas. The presentation should begin with a simple introduction for the uninitiated. Be sure to acknowledge the contributions of others in the field, and not only if they happen to be in the room. Follow with a brief summary of the results to be presented and then build in layers until the heart of a topic and the data are ready to be explained. Most speakers present far too many slides and an excessive amount of material, much more than any but the few experts can comprehend. Slides should be limited in number; one every two minutes of a presentation is a good place to start. The slides should be designed for simplicity. Every data point should be described and each slide should not develop more than one experimental result. Figures from publications often do not make effective slides. Color can be an effective tool, but certain schemes are distracting and some combinations provide poor contrast. A colorful presentation from a colorful personality may be entertaining, but the final impact may be amnesia-inducing. Successful presentations follow an arc progressing from the historical origin of an idea through the critical tests and the logical conclusion.

During the presentation itself, address the audience and not the screen. Speak slowly and clearly, again assuming most people do not know the jargon of the field. Look for facial cues from the audience indicating comprehension and attention. Effective speakers develop a rapport with the audience and can judge the level of interest from nods and smiles or yawns and distracted daydreaming. A friendly face in the audience can often dispel the anxiety that is quite natural in most, even experienced, public speakers. Use a pointer with some precision to highlight a data point but not as a magic wand to bless the slide.

Use a pointer with some precision to highlight a data point but not as a magic wand to bless the slide.

Many speakers use humor or personal anecdotes to leaven a presentation. Of course, such asides can become excessive and distracting (mea culpa!). Here again, it helps to develop a personal bond with the audience. Take note of the techniques and style of the best lecturers. Mention the names of co-workers throughout a presentation and use anecdotes to

personalize the impact of their contributions. Where appropriate, practice a presentation in front of friendly but critical peers.

Stick to a prescribed time limit. An excellent seminar spoils quickly when the speaker goes more than a few minutes over time. A well-paced seminar will conclude near the time limit with final results that round out the theme, a restatement of the conclusions, and an indication of future directions. Although it is typical to conclude with a list or picture of collaborators, the role of a student, postdoctoral or colleague will be lost if he or she is not highlighted during the presentation. If time and format permit, the post-seminar question period presents another opportunity to explain and highlight results and new directions. Questions from the audience must be treated with respect and patience. Clear and succinct responses reinforce the good impression left from a well-paced and modest presentation. Arrogance pays no dividends.

Clear and succinct responses [to questions] reinforce the good impression left from a well-paced and modest presentation.

Finally, enjoy the experience. An effective presentation and an appreciative audience can be one of the great pleasures of a life in science. ■

—Randy Schekman

MEMBER Gifts

The ASCB is grateful to the following members who have recently given a gift to support Society activities:

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Alan Rick Horwitz

"Garrison Keillor's Lake Wobegon stories about growing up shy and terrified of standing out are totally true," says Rick Horwitz, who should know. The Minnesota native now lives outside Charlottesville, where he's on the faculty of the University of Virginia. "Yet the 'Minnesota thing' remains deeply engrained," says Horwitz, who remembers quitting competitive wrestling in high school because shy people aren't supposed to win. "That's a classic Minnesota thing," says Horwitz. "The last thing you ever want to do is stand out in anything. First place is not an option. Second place is okay, but third place is best for us." Competitive swimming filled that bill better.

Horwitz's version of Lake Wobegon was St. Louis Park, a suburb of Minneapolis, which he describes as "this little Jewish community on the Scandinavian tundra." It was a productive patch of tundra. In the Horwitz family era, St. Louis Park also turned out the comedy writer Al Franken; the movie-making Coen brothers, Joel and Ethan; and *The New York Times* pundit and book author, Thomas Friedman.

"If you take Jewish neurosis and ambition and put that in an environment of Scandinavian reserve, you get someone like me."

"If you take Jewish neurosis and ambition and put that in an environment of Scandinavian reserve, you get someone like me," says Horwitz.

What you also get, according to Horwitz's colleagues, collaborators and former students, is a first-rate scientific mind at home in a half dozen fields, combined with a natural talent for collaboration. A case in point is the Cell Migration Consortium. Horwitz first developed the consortium with his University of Virginia colleague Tom Parsons in 2001. It was one of the first "glue grants" funded by the NIH National Institute of General Medical Sciences to encourage cross-disciplinary approaches to problems that no single investigator could tackle. Horwitz and Parsons brought 38 investigators from over a dozen institutions together into several "initiatives." The plan was to pull together what is known about key migration-related proteins in one accessible location, while developing tools, technologies and ideas to learn more.

Online databasing, virtual meetings, and full-time scientific manager Nikki Watson have made the glue grant feasible, according to Ken Jacobson of the University of North Carolina, but Rick Horwitz was the human glue.

"I was one of the original people but certainly Rick, along with Tom Parsons, deserves the lion's share of the credit," says Jacobson, who works in the Consortium's Imaging Initiative. "Few people have the motivation or the ability to do this in the way that Rick has. Most of us (in the Consortium) are amazed at how well Rick has handled the scope of the glue grant from genetic screening to computational modeling. You have to have a reasonable awareness of all this stuff and know enough to keep it all moving in the right direction. Rick has this amazing ability to assimilate new ideas quickly and yet do it in a way that protects other people's interests. Plus he really does it for the love and the benefit of the field as opposed to doing it for the sheer professional glory. You can never run something as big as this without some occasional ill will, but Rick has been able to diminish those feelings and keep this on track."

"The keen intelligence, experimental skills, and Horwitz's ability to 'keep things friendly' were there from the beginning …."

"Rick Horwitz has always had a natural talent for collaboration," says Clayton Buck, the recently retired Director of the Wistar Institute in Philadelphia. Buck worked closely with Horwitz in the early 1980s when Horwitz was at the University of Pennsylvania. "Rick has been a fantastic leader in the community," Buck notes. Horwitz works to ensure that collaborators communicate, meet goals, and work together.

"The keen intelligence, experimental skills, and Horwitz's ability to 'keep things friendly' were there from the beginning of his independent career," says Buck. Buck heard Horwitz lecture at Penn on membrane structure and was struck by his brilliance. Their labs were just across the street, Buck remembers.

"We'd been struggling to isolate the membrane proteins involved in adhesion. Unbeknownst to me and for different reasons, Rick came up with a monoclonal antibody that perturbed adhesion during muscle development in embryos," Buck recalls. "So we purified it and

made some antibody affinity columns and began pulling out what turned out later to be a bunch of integrins."

Actually, Horwitz and Buck had an integrin beta-subunit, but they were not alone in struggling with pieces of the integrin problem. Richard Hynes at MIT and others were examining the problem from other directions.

"Richard called us up and asked if we'd be interested in collaborating," Buck recalls. John Tamkun, who was a postdoc in Hynes' lab, was working on the expression cloning for fibronectin. "So we were always going back and forth," Buck continues. "It was a lot of fun. It was Hynes who came up with the name 'integrin' and the first comprehensive review to place 'integrins' in their total biological perspective," says Buck.

With Horwitz, egos just didn't get in the way.

"Everyone knew one another. People talked to each other. But it was Rick who was instrumental in keeping everything aboveboard and friendly …[and] was absolutely pivotal in the field because he was there in the beginning," Buck adds. With Horwitz, egos just didn't get in the way.

"Rick taught me how to have fun in science," says Anna Huttenlocher, of the University of Wisconsin, Madison. Huttenlocher was a postdoc in the Horwitz lab at the University of Illinois, Urbana–Champaign. She remembers Horwitz's advice: "Go after the important questions that are exciting to you and then be on the leading edge." She also learned the value of bringing people with diverse perspectives together. "Rick just loves new ideas," Huttenlocher concludes.

Alan Fredrick Horwitz, as he was named at birth, was born in Minneapolis. However, he can't remember living anywhere but St. Louis Park and being called anything but Rick. Nevertheless, his publications can be found under "A. Horwitz," "R. Horwitz," "A.R. Horwitz and "A.F. Horwitz." "That's why you can't find me easily on PubMed," he says.

A scientist was the last thing his parents wanted him to become. His parents were "not particularly intellectual," Horwitz says. They were products of the Great Depression and were unable to go to college since they had to scramble for a living. "The dictum in our house was that there are book smarts and there are street smarts, and street smarts are a lot smarter," he recalls. Horwitz remembers stopping by his father's wholesale distributing office after his freshman year in college. "There were all my great uncles sitting there and they said, 'Ricky, have you figured out what you want to do?' And I said, 'I want to be a research scientist at a university.' And they looked at me and said, 'Don't do it. Go make some money, first.' At the very least, they wanted me to go to medical school."

In any case, Horwitz wasn't exactly pre-med material when he entered the University of Wisconsin. His overall high school record was abysmal, says Horwitz. He had been a lousy student—bored, unmotivated and happily mediocre—until his sophomore year. For reasons he never altogether understood, his parents suddenly took him out of the public high school. For one year, he was sent to the Blake School, a nearby day prep school that was small, intense, and academically difficult. To his own astonishment, Horwitz discovered that the harder the subject, particularly if it involved math or chemistry, the better he liked it, and the harder he worked.

Back in public school the following year, Horwitz sank back into academic torpor; passive learning and sitting still weren't his natural attributes. Then his guidance counselor suggested that as college wasn't for everyone, he might be happier in a "Voc-Ed" program. This was just the spur Horwitz needed. He changed counselors and went off to Wisconsin, determined to study something interesting, complicated, and difficult. He ended up in the undergraduate Honors program, majoring in chemistry with almost enough physics and math to make a triple major. For his senior year thesis, Horwitz worked in a nuclear chemistry lab doing neutron activation analyses on geologic samples. "The professor, Larry Haskins, gave me a project," Horwitz remembers, "and then left me on my own. I did the first experiment and then I didn't want to go home. I kept thinking, 'Well, what if I did it again but like this? How would that change the result?' So I did it and then I wondered, 'Well, what would the next thing be?' It was the most exhilarating thing I'd ever done. Within a week, I was absolutely hooked on research."

Horwitz discovered that the harder the subject [particularly if it involved math or chemistry], the better he liked it, and the harder he worked.

Horwitz earned his doctorate in Biophysics from Stanford in 1970, working in Harden

McConnell's magnetic resonance lab on hemoglobin cooperativity and the just-emerging problem of membrane fluidity. He did a post-doc at the University of California, Berkeley, in the chemistry lab of Nobel Laureate Melvin Calvin and Mel Klein. He worked on lipid structure using NMR. To widen his expertise and point him toward his interest in cell biology, Horwitz traded his services, at night, as a bench biochemist, to virologist Harry Rubin in return for training in cell culture. His job search yielded a job offer from the University of Pennsylvania School of Medicine and a one-year fellowship offer from Max Burger's Biozentrum lab in Basel. Penn deferred the job and Horwitz went to Switzerland to work on membrane fluidity and cell adhesion.

"Listening to Garrison Keillor is therapy … It took me ten years of listening to Garrison Keillor before I finally understood what I was."

The Horwitz lab opened in 1974 at Penn, and focused on adhesion and membrane fusion questions. His tools quickly became hybridomas: fused cell lines that could produce specific monoclonal antibodies against unknown membrane surface proteins in muscle cells. One of these antibodies yielded a vital piece in the search for adhesion receptors and led to his collaboration with Clayton Buck on what would turn out to be integrin. Horwitz left Penn in 1987 for the opportunity to build a Cell and Structural Biology Department at the University of Illinois, Urbana–Champaign. In 1999, he moved east again, this time to the University of Virginia School of Medicine in Charlottesville.

Today Rick and his wife, Carole, who is the Director of Communications for the university's Integrated Systems Project and his "true soul mate," live on a ridge top outside Charlottesville. The house has sweeping mountain views, an abundance of wildlife, and the family's peripatetic piano, which has followed them around the country.

The piano was a necessity, says Horwitz, who now prefers to play his stereo system. He and Carole first met folk dancing in Berkeley; and although they've never been folk dancing since, music has been a constant. A second Horwitz piano recently left home with their son Jeremy, who took it to Chicago and then to Cambridge, MA. Jeremy is a software designer by day and an off and on musician/composer by night.

Horwitz's daughter Rachel, is a survey statistician in Washington, DC, with the U.S. Census. "Rachel keeps me active," says Horwitz. "I was moaning that I'd always wanted to try windsurfing and suddenly Rachel is saying, 'Let's do it. Come on. We can do it together.' So now we're windsurfing." They windsurf from the family's "cinderblock" beach house on Chesapeake Bay, where they keep a small flotilla of small craft for sailing, fishing and windsurfing.

In Charlottesville, Horwitz enjoys walking through Thomas Jefferson's famous quadrangle on the way to the campus gym. Regular pleasures also include audio courses like the one he just completed on high medieval history. Not to be omitted from the list is listening to Garrison Keillor's Lake Wobegon tales on the radio. "Listening to Garrison Keillor is therapy," says Horwitz. "My wife will agree. It's like going to a therapist. I'd hear all his stuff and I'd say, 'Yeah? Yeah? And it's okay to be that way?' It took me ten years of listening to Garrison Keillor before I finally understood what I was."

Radio therapy is definitely a Minnesota thing. ■

Bush Budget: Bad News for NIH, Good News for NSF

State of the Union Includes Attack on Biomedical Research

President Bush's Fiscal Year 2007 budget proposal freezes spending for the National Institutes of Health (NIH). The President has requested $28.578 billion, the same as the final FY 2006 appropriation. The Bush budget contains a cut in funding for every Institute at the NIH except the National Library of Medicine, which is funded at the same level as in last year's budget. The budget for the Office of the Director is the only individual NIH budget to be increased. The total number of Research Project Grants (RPGs) in the 2007 budget request is 35,805: 642 fewer than 2006. The number of competing RPGs is increased to 9,337, an increase of 275 from 2006.

The Bush budget contains a cut in funding for every Institute at the NIH except the National Library of Medicine, which is funded at the same level as in last year's budget.

The budget request for the National Science Foundation (NSF) is significantly better. The President is asking Congress to provide the NSF with $6.02 billion, a 7.9% or $439 million increase from 2006. The Directorate for Biological Sciences, which provides support to the biological sciences, is funded at $607.85 million, 5.4% or $31.16 million more than 2006.

A week before the release of the 2007 budget proposal, the President delivered his 2006 State of the Union Address to Congress. The President called on Congress to pass legislation "to prohibit the most egregious abuses of medical research." In particular, the President asked for passage of legislation to prohibit "human cloning in all its forms…creating or implanting embryos for experiments…creating human-animal hybrids…and buying, selling or patenting human embryos." Several of the bills the President referred to have already been introduced in the Senate by Senator Sam Brownback (R-KS). In a reference to the retraction of two published papers by the South Korean group led by Woo Suk Hwang, the President stated that, "A hopeful society has institutions of science and medicine that do not cut ethical corners."

As part of his efforts to keep the nation competitive, the President is proposing a doubling of basic physical sciences research programs over ten years.

Details of the Bush NIH budget can be found at http://officeofbudget.od.nih.gov/ui/2007Budget.htm.

The complete text of the 2006 State of the Union Address is at http://www.whitehouse.gov/stateoftheunion/2006/. ■

ASCB Public Policy Committee Needs You

The ASCB's Public Policy Committee is launching a new program to enlist more ASCB members in the critically important public policy advocacy work done by the Committee. The program, Project 50, the ASCB Public Policy Advocacy Team, aims to recruit at least one ASCB member from each of the 50 states. The Committee hopes ASCB members who are concerned about the current commitment by the federal government to biomedical research and interested in strengthening that commitment will join Project 50.

Project 50 members will help organize their local colleagues in support of biomedical research. ASCB staff will help Project 50 members to organize and lead meetings with their Members of Congress and to speak out in support of biomedical research. Members will work closely with the Public Policy Committee and staff. Project 50 will also work closely with the Joint Steering Committee for Public Policy. They will also receive special briefings and updates on critical public policy issues.

To sign up, see www.ascb.org/public policy. ■

NIH to Help Postdocs

Making young scientists financially independent is the goal of the new Pathway to Independence Program, Elias Zerhouni, Director of the National Institutes of Health, announced this month. The NIH plans to award between 150 and 200 of these five-year grants each year. The awards will be competitive and awarded based on submitted research proposals.

Under the program, postdocs would receive $90,000 for each of the first two years as they work on their research under the mentorship of a senior researcher. Awardees would then be eligible for up to $250,000 for each of the next three years to help them establish themselves in assistant professorship positions.

With these grants awarded to the scientist and not the university … young researchers will be able to have more control over their own careers.

With these grants awarded to the scientist and not the university, NIH Director Zerhouni hopes the young researchers will be able to have more control over their own careers. Zerhouni also noted that Pathway-supported scientists would also be more attractive to universities in search of new faculty.

For more information, visit http://grants.nih.gov/grants/new_investigators/pathway_independence.htm. ■

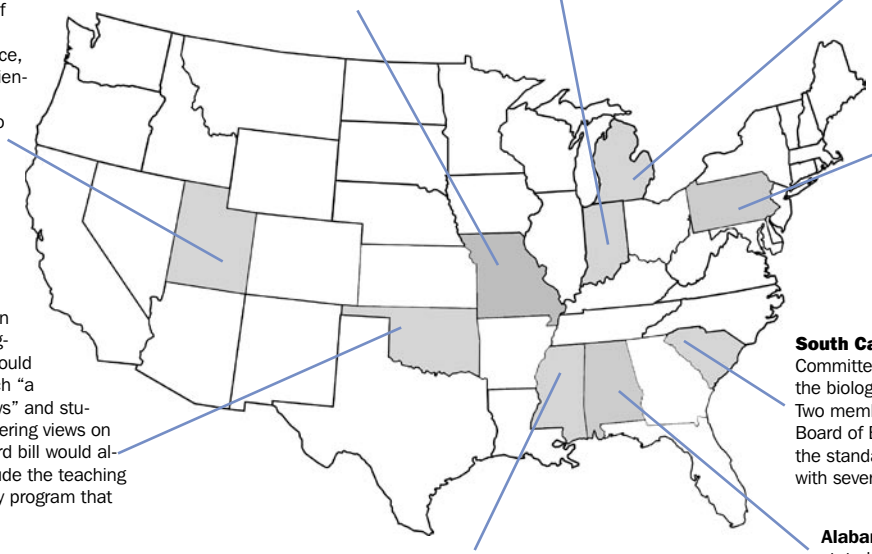
Creationism Monitor Update

Utah—Senate bill 96 has been introduced in the State Senate that, if enacted, would require "that instruction to students on any theory regarding the origins of life, or the origins or present state of the human race, shall stress that not all scientists agree on which theory is correct." The bill also would prohibit the State Board of Education from taking a position on any particular theory of evolution.

Missouri—The Missouri Science Education Act has been introduced in the State House of Representatives. The bill requires science teachers in grades 6–12 to follow a list of "best practices." Included in the bill is a requirement that "a critical analysis" of any theory of biological origins must be taught.

Indiana—A bill has been introduced in the State House of Representatives that would prohibit the school board from adopting textbooks "if the state board knows the textbook contains information, descriptions, conclusions, or pictures that are false."

Michigan—State Representative Brian Palmer introduced a bill to make changes to state high school graduation and course content requirements. The bill includes the requirement that "course content expectations for science shall include using the scientific method to critically evaluate scientific theories and using relevant scientific data to assess the validity of those theories and formulate arguments for and against those theories."



Pennsylvania—The Dover Area School Board voted not to appeal the U.S. District Court ruling that "Intelligent Design" cannot be taught in Dover biology classes. The board also voted unanimously to rescind the curriculum change that sparked the original lawsuit.

Oklahoma—Three evolution-related bills have been introduced in the state legislature. Two of the bills would protect teachers who teach "a full range of scientific views" and students who might have differing views on the origins of life. The third bill would allow public schools to include the teaching of Intelligent Design in any program that teaches evolution.

South Carolina—The State Education Oversight Committee has decided to delay its decision on the biology section of the education standards. Two members of the Committee will work the State Board of Education to develop specific language for the standards. The decision follows a lengthy hearing with several witnesses, including two scientists.

Mississippi—Two evolution-related bills have been introduced in the state legislature. If enacted, House bill 953 would require creationism and intelligent design to be included in any local science curriculum that teaches evolution. Senate bill 2427 would permit teachers to discuss or answer questions from students on the "flaws or problems" in the Theory of Evolution and the existence of alternative theories of evolution.

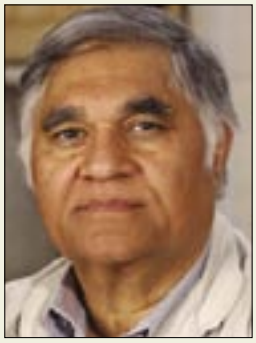
Alabama—Two bills have been introduced in state legislature that would protect teachers who teach "a full range of scientific views." The bill also protects students who might have differing views.

Source: various media reports

2006 Congressional Biomedical Research Caucus Briefings

March 1

Nancy Padian
University of California, San Francisco
Protecting Women from Infection with HIV



April 5

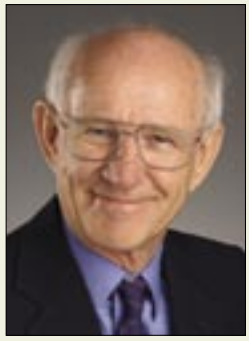
Inder Verma
Salk Institute for Biological Studies
Whatever Happened to Gene Therapy?

April 26

Bruce Alberts
University of California, San Francisco
Teaching Science: How We Fail and How We Could Succeed

May 10

Joe Leigh Simpson
Baylor College of Medicine
Earlier and Safer Detection of Fetal Down's Syndrome



June 7

Rob Webster
St. Jude Children's Hospital
The Risk of Avian Flu

June 28

Kelly Frazer
Perlegen Sciences
Finding Genes for Human Disease: The HapMap Project

July 19

James Allison
Memorial Sloan-Kettering Cancer Center/HHMI
Using the Immune System to Fight Cancer

July 26

Erin O'Shea
Harvard University/HHMI
Systems Biology: A New Science

September 13

Esmail Zanjani
University of Nevada
Chimeras: What Are They and How Could They Be Useful?

September 27

David Fisher
Dana Farber Cancer Institute
Gray Hair and Skin Cancer

The Joint Steering Committee for Public Policy (JSC) works with the Congressional Biomedical Research Caucus to provide Members of Congress with the timely and critical information needed to make knowledgeable policy decisions in the rapidly evolving area of basic biomedical research. The JSC is a coalition of the American Society for Cell Biology, the Genetics Society of America, Science Service, and the Society for Neuroscience.

LETTERS to the Editor

Where Have All the Women Cell Biologists Gone?

To the Editor:

I enjoyed very much your President's Column [December 2005] about women cell biologists (or the lack thereof!)in the October 2005 issue of the *ASCB Newsletter* …. I have been working in Germany now for almost five years and have become involved in the Career Development Committee of ELSO (www.elso-cdc.org/). I have organized and we have just launched a Database of Expert Women in the Molecular Life Sciences. It is restricted to European women (or non-Europeans like me, working in Europe), and perhaps ASCB would consider doing something similar in the U.S. … The biggest problems you mention in your article—the low number of female applicants for group leader positions, and the problems with maintaining gender balance in the speaker lists of conferences—are addressed by such a database, because one can:

a) Search the database for postdocs, who can be invited to apply for faculty positions.
b) Search the database for speakers or members of committees, etc.
c) Refer to the database as a source when you can't accept the latest invitation. Cite the database as a reason why there is no excuse!

—Karla Neugebauer

Editor's Note: The ASCB Women in Cell Biology (WICB) Committee offers a referral service for women speakers; see http://ascb.org/committees/wicb/index1.cfm?Subgroup=WICB%20Speaker%20Referral%20Service.

Dear Editor:

I can only endorse, with bells on, the Editor's Note in the December issue about the *ASCB Newsletter*. It's a great feature of ASCB membership, and is by far the best society newsletter I receive, despite its U.S. focus. And a monthly newsletter is about the right frequency for such an active society. I belong to a small nonprofit society in Australia, WISENET (Women in Science Enquiry Network; www.wisnet-australia.org/) which publishes a newsletter three times per year.

I'd like to comment briefly on the President's Column in the October 2005 issue of the newsletter—"Where have all the women cell biologists gone?"—and the WICB column by Elizabeth Marincola in the December 2005 issue, "Do we still need a Women in Cell Biology Committee?" Apart from the pressures of child-rearing, there is still a subtle, persistent, and deeply ingrained discrimination hindering women. Both men and women are slightly biased against women in this way, even if they think they aren't.

For example, surveys of teachers' behavior in the classroom show that they consistently pay more attention to male rather than female students. In another example, two versions of a resumé were sent out to academics for assessment, identical except that in one version the candidate was female, in the other the candidate was male. Both male and female academics ranked the male resumé higher than the female one, and by a similar amount.

We just can't help ourselves—unless we are aware of our inherent biases. And finally, women still do tend to undervalue themselves, whereas men seem more comfortable with self-promotion. These are further reasons why we still need Women in … committees. As some wit once said, when a mediocre woman is hired above an excellent man, then we'll have achieved equality!

—Rosemary White

Keeping Cell Biology at the Forefront of Science

To the Editor:

In Zena Werb's excellent President's Column in the December issue of the *ASCB Newsletter,* she raises a point that is near and dear to many of us, and I profoundly thank you for that. As a dad I am also interested in supporting my daughters' local school with the best possible information about biology. You refer to the free *Cell Biology Education* journal that the ASCB makes available. Could you be so kind and connect me with someone who can provide me more information about this?

—Jack Elands

Editor's Note: Thank you for your letter to Dr. Werb. The ASCB publishes an online, quarterly, peer-reviewed education journal, Cell Biology Education—a Journal of Life Science Education. *It is freely available online to all readers.*

You can register as a user and view our journal at www.cellbioed.org. Launched in 2002, the journal covers educational issues in all biological disciplines, K–20. CBE's *mission is to help its contributors and readers think more deeply about the way they teach and improve their teaching skills. To this end, we ask contributors to approach their teaching as they do their research. This means not just experimenting with new approaches but also collecting evidence to evaluate their effectiveness.*

Please note that with our Spring 2006 issue, we will be changing the name of the journal to CBE—Life Sciences Education *and our URL to lifescied.org.*

I hope you will find our education journal a valuable resource.

To the Editor:

Thank you for your continued advocacy on behalf of new investigators. In the December 2005 *ASCB Newsletter*, Zena Werb wrote that, "Excessive difficulty in obtaining their initial competitive research funding disheartens young investigators, which in turn sends negative signals to students choosing a discipline or career." You can't imagine ….

I just returned from my first ASCB Annual Meeting in several years. As usual, the meeting was an outstanding mix of scientific talks and posters, and I learned a lot. I also attended the sessions on NSF and NIH funding. The program directors were articulate, as usual, and their advice was useful. One can only believe, however, that their efforts will not be helpful for most of us.

The NSF speaker freely admitted that last year the success rate for cell biology proposals at NSF was 12%. From an NSF program director I received this in an email last month about my recent proposal (since "declined"): "The competitive situation we are experiencing is not a good one. We anticipate a *best-case success rate of 10%,* and it is quite *likely that it will be worse* than that. We will have either the same or (most likely) fewer funds available than in prior years, yet we have more proposals, and the cost of the projects are going up just because the research costs are increasing each year." Indeed, I would call this "disheartening." I hear through the grapevine that NIH success rates will be similar in many institutes. More bad news ….

What does this mean for the "new investigator," of which I am one, though not young anymore? Well, if NSF funds *less* than 10% of its cell biology proposals, then the number of proposals by new investigators that are funded can only be very low. It seems to me that, at success rates this low, funding decisions are either essentially predetermined or stochastic. You can take your pick. The end result is the same.

And the consequences are dire for many. Senior faculty and promotion/tenure committees have no sympathy. And you are correct about the secondary effects on students. Many reach the conclusion that life is way too short to spend much time reading reviews that call your work "excellent" but then nitpick it to death so they can leave you unfunded in good conscience. That severe budget constraints lead to this does not register with graduate students.

Again, I thank Zena for her efforts as president. ASCB is a great organization, and I'm proud to be a member.

—Anonymous

Editor's Note: ASCB's advocacy efforts—through the ASCB's Public Policy Committee, membership in the Joint Steering Committee, and the new Project 50—are more important than ever. *See page 15.*

Keeping Politics and Religion Out of Science

To the Editor:

Thank you to Zena Werb for sharing her opinions in the November 2005 President's Column, "Keeping Politics and Religion out of Science." I enjoyed hearing about the ASCB's role in education and science writing. Educating our public about science is a serious task, one that many of us hold dearly.

You are correct in saying that data-gathering and hypothesis-testing produce objective results. However, interpretation of results is never a completely objective process. All of us, as humans, hold presuppositions that influence our worldview. Nothing that we do remains *wholly* separate from our presuppositions, nor should it, if we are to function as integrated, holistic persons, fully human in every capacity.

By stating that persons of faith should check their religion at the laboratory door, you are suggesting that only naturalists can truly be objective. This seems to me the worst sort of philosophical bigotry. The scientific field has embraced cultural and gender diversity, recognizing that each viewpoint brings richness to the field. Should this not be the same for philosophical diversity? Should not the scientist follow his/her data where they lead, irrespective of whether they conflict with naturalistic philosophy?

While I agree with your statement that exposure to the intelligent design hypothesis should not be mandated in public schools, I take issue with the blanket term "pseudoscience." If scientists are forcing data to conform to their worldview, they are not being true to the scientific method. However, if they are simply following the data where they lead, then they are doing legitimate science. There are some in the intelligent design community who are simply following their data, trying to come up with falsifiable hypotheses. Conversely, there are some in the naturalistic evolution community who are trying to fit the data to their hypothesis, rather than following where the data lead. In each "camp," there is legitimate science and pseudoscience.

Finally, the embryonic stem cell question is a complex moral issue that should not be dismissed as either "religion" or "politics." The question comes down to whether a frozen embryo represents a human, or simply a "seed" with potential to develop into a human. For those who hold to the conception view of personhood, the diploid zygote represents a human, and research on such embryos is morally troubling. For those who hold to an implantation view of personhood, such research is ethically permissible, if not laudable. I have yet to come across anyone on either side of the issue who would justify incineration, rather than use, of embryonic stem cell tissue. Those who believe in the conception view of personhood would advocate embryo adoption rather than any destruction of human persons, either for research purposes, or by incineration or other disposal methods.

Thank you for allowing me to use this forum to express an opposing view.

—Heather G. Kuruvilla

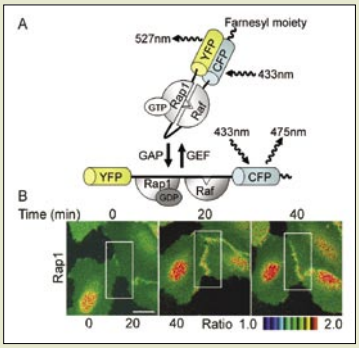
To the Editor:

I just wanted to drop a line to express my admiration for the President's Column in *ASCB Newsletter*, "Keeping Politics and Religion out of Science." I really like its courage—it discusses some important but sensitive and thus avoided issues, and it does that in a constructive, positive way! ■

—Ivanka Dilova

INCYTES from *MBC*

February, Vol. 17, No. 2



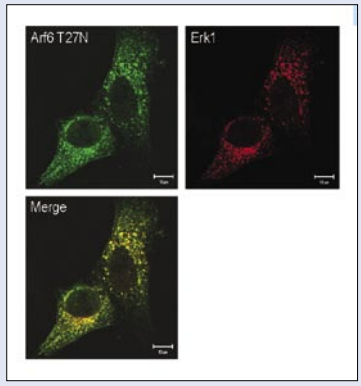
MAGI-1 Is Required for Rap1 Activation upon Cell–Cell Contact and for Enhancement of Vascular Endothelial Cadherin–mediated Cell Adhesion

Atsuko Sakurai, Shigetomo Fukuhara, Akiko Yamagishi, Keisuke Sako, Yuji Kamioka, Michitaka Masuda, Yoshikazu Nokaoka, and *Naoki Mochizuki*

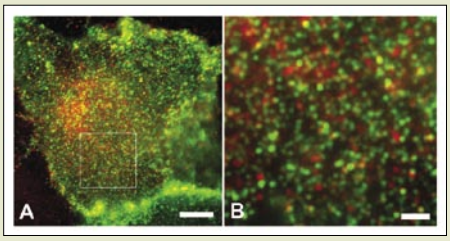
Intercellular adhesion between vascular endothelial cells must be sufficiently strong to serve as a barrier separating blood from tissue, yet dynamically regulated to allow for leukocyte transepithelial migration. Here it is established that the Ras-family GTPase Rap1 functions in a positive feedback loop to tighten VE-cadherin–mediated cell adhesion. Raichu-Rap1, a chimera consisting of yellow fluorescent protein (YFP)-Rap1 and the Ras-binding domain of Raf fused to cyan fluorescent protein (CFP), was used as a reporter molecule to localize Rap1 activation. In its GTP-bound, activated state Raf binds intramolecularly to Rap1, inducing fluorescence resonance energy transfer between the N- and C-terminal YFP and CFP moieties. Rap1 activation was shown to occur at sites of cell–cell contact in a Ca^{2+}– and VE-cadherin–dependent manner. Recruitment and activation of Rap1 required the scaffolding molecule MAGI-1, which binds to both VE-cadherin through β-catenin and to a Rap1–guanine nucleotide exchange factor, PDZ-GEF1. Activated Rap1 induces

Erk Signaling Regulates Clathrin-independent Endosomal Trafficking

Sarah E. Robertson, Subba Rao Gangi Setty, Anand Sitaram, Michael S. Marks, Robert E. Lewis, and *Margaret M. Chou*



The extracellular signal-regulated kinases, Erk 1 and 2, are among the most abundant kinases. Erk is recruited to and activated at diverse subcellular locations, including the Golgi, late endosomes, focal adhesions, and the leading edge, by a growing number of distinct scaffold molecules. In addition to its well-established roles in cell proliferation and survival, when activated at these distinct subcellular locations Erk functions in cell adhesion, migration, Golgi fragmentation, and phagocytosis. This paper demonstrates a role for Erk at the Arf6 tubular endosome. Internalization and recycling through the clathrin-independent, Arf6-dependent endocytic pathway has also been implicated in a wide variety of cellular functions, including adhesion, migration, phagocytosis, and immune surveillance. Here it is shown that the scaffold molecule KSR1 targets Erk and MEK to Arf6 tubular endosomes and that Arf6 activity is required for Erk activation by EGF. These data suggest a possible link between trafficking through this still enigmatic pathway, the regulation of Erk activation, and their function in diverse cellular processes.



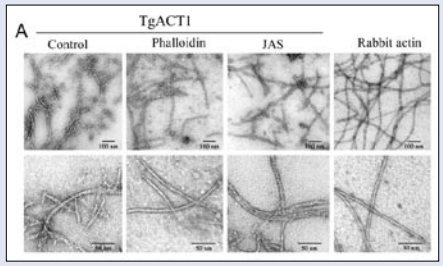
Syntaxins 3 and 4 Are Concentrated in Separate Clusters on the Plasma Membrane Prior to the Establishment of Cell Polarity

Seng Hui Low, Amit Vasanji, Jayasri Nanduri, Min He, Nikunj Sharma, Michelle Koo, Judith Drazba, and *Thomas Weimbs*

SNARE proteins are critical components of the vesicular trafficking machinery because they function both in establishing the specificity of vesicle targeting and in mediating membrane fusion. Here it is shown that the t-SNARE proteins syntaxin 3 and 4, which direct vesicular targeting and fusion to the apical and basolateral surfaces of polarized epithelial cells, respectively, exist in mutually exclusive, uniform clusters on the plasma membrane even in non-polarized cells. Interestingly, the mechanisms of clustering are also distinct: The formation and/or maintenance of syntaxin 3 clusters require an
to cholest
of t-SNAREs may be necessary for their function, perhaps to ensure correct and specific localization of fusion events or to enhance the efficiency of membrane fusion after docking.

Unusual Kinetic and Structural Properties Control Rapid Assembly and Turnover of Actin in the Parasite *Toxoplasma gondii*

Nivedita Sahoo, Wandy Beatty, John Heuser, David Sept, and *L. David Sibley*



Toxoplasma gondii and other obligate intracellular parasites of the phylum Apicomplexa exhibit an unusual form of motility, called gliding, which they use to actively penetrate and invade host cells. Actin filament polymerization mediates the movement and coordinates its directionality, yet little is know about how actin assembly/disassembly is regulated in these parasites, and paradoxically, actin filaments are rarely detected. This paradox is partly explained by the in vitro assembly properties of purified *Toxoplasma* actin (TgACT1). The authors show that TgACT1 is adapted for rapid cycles of assembly and disassembly. It assembles at concentrations 3- to 4-fold lower than conventional actin but forms only short, unstable filaments that are, on average, 10–20 times shorter than filaments formed from conventional actin. Structural modeling of TgACT1, which is 83% identical to vertebrate actin, reveals conserved sequence changes in residues that stabilize actin filaments. The unique biochemical properties of parasite actins may render them useful targets of therapeutic intervention. ■

The American Society for Cell Biology
2006 Call for Nominations

Bruce Alberts Education Award

Who is Eligible: An individual who has demonstrated innovative and sustained contributions to science education with particular emphasis on the local, regional and/or national impact of the nominee's activities. The primary nominator must be a member of the ASCB but the candidate and support letter authors need not be.

How to Apply: Provide a letter of nomination, letters of support and CV.

Award: The winner is presented a plaque and will give remarks at the 46th ASCB Annual Meeting. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

Early Career Life Scientist Award

Who is Eligible: An individual who has received a doctorate since 1993 and has served as an independent investigator for no more than seven years. The primary nominator must be a member of the ASCB but the candidate and support letter authors need not be.

How to Apply: Provide the candidate's CV, a brief research statement and a nominating letter plus no more than three letters of support, at least one of which must come from outside the candidate's current institution.

Award: The winner gives a lecture at the 46th ASCB Annual Meeting. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

Public Service Award

Who is Eligible: An individual who has demonstrated outstanding national leadership in support of biomedical research. Any ASCB member may submit a nomination. The award winner may but need not be a scientist.

How to Apply: Provide a letter of nomination with a description of the nominee's advocacy for and promotion of scientific research.

Award: The winner gives the Public Service Award Lecture at the 46th ASCB Annual Meeting and receives a certificate. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

Merton Bernfield Memorial Award

Who is Eligible: An outstanding graduate student or postdoctoral fellow who has excelled in research.

How to Apply: The student or post-doc or their advisor should submit a one-page research statement, a list of publications, a copy of the abstract submitted to the current year's Annual Meeting, and the advisor's letter of recommendation. Post-docs may also submit the recommendation of their graduate student advisor. Duplicate applications from graduate students may be submitted for the Gilula and Bernfield Memorial Awards.

Award: The winner speaks in a Minisymposium at the 46th ASCB Annual Meeting and receives an honorarium. Expenses to attend the Annual Meeting are paid.

Deadline: August 1.

Norton B. Gilula Memorial Award

Who is Eligible: An outstanding graduate or undergraduate student who has excelled in research.

How to Apply: The student or advisor should submit a one-page research statement, a list of publications, if any, the abstract submitted to the current year's Annual Meeting and the advisor's letter of recommendation. Duplicate applications from graduate students may be submitted for the Gilula and Bernfield Memorial Awards.

Award: The winner is presented a plaque. Expenses to attend the Annual Meeting are paid.

Deadline: August 1.

E.E. Just Lectureship

Who is Eligible: A minority scientist who has demonstrated outstanding scientific achievement. The primary nominator must be a member of the ASCB but the candidate need not be.

How to Apply: Provide a nomination letter with a description of the nominee's scientific achievement and mentoring support of underrepresented minority students and scientists.

Award: The winner gives the E.E. Just Lecture at the 46th ASCB Annual Meeting, and receives a plaque. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

E.B. Wilson Medal

Who is Eligible: An individual who has demonstrated significant and far-reaching contributions to cell biology. The primary nominator must be a member of the ASCB but the candidate need not be. The E.B. Wilson Medal is the ASCB's highest award for science.

How to Apply: Provide the candidate's CV and no fewer than three and no more than five letters of support.

Award: The winner gives the E.B. Wilson Lecture at the 46th ASCB Annual Meeting, and receives the E.B. Wilson Medal. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

WICB Career Recognition Award

Who is Eligible: The Junior Award is for a woman in an early stage of her career (assistant professor or equivalent) who has made exceptional scientific contributions to cell biology and exhibits the potential for continuing a high level of scientific endeavor while fostering the career development of young scientists. The Senior Award is for a woman or man in a later career stage (full professor or equivalent) whose outstanding scientific achievements are coupled with a long-standing record of support for women in science and mentorship of young scientists.

How to Apply: For the Senior Award, provide a letter of nomination, CV of the candidate and a maximum of five letters of support. For the Junior Award, provide a letter of nomination, CV of the candidate, and a maxiumum of three letters of support.

Award: The winners are presented an honorarium and plaque at the 46th ASCB Annual Meeting. Expenses to attend the Annual Meeting are paid.

Deadline: March 31.

All applications and nominations may be submitted to:

The American Society for Cell Biology
8120 Woodmont Avenue, Suite 750
Bethesda, MD 20814-2762
ascbinfo@ascb.org

For names of prior awardees or more information, see www.ascb.org or contact the ASCB at (301) 347-9300, or ascbinfo@ascb.

GRANTS & OPPORTUNITIES

National Academies Fellowship. Graduate or postdoc students who have completed graduate studies and research within the last five years can apply for the Christine Mirzayan Science and Technology Policy Graduate Fellowship Program. Deadlines are March 1 and June 1. See http://national-academies.org/policyfellows.

NIAID Biodefense Fellowships. The NIH National Institute of Allergy and Infectious Diseases solicits applications from biodefense training and development researchers of prevention, detection, diagnosis and treatment of diseases caused by potential bioterrorism agents. Grants, fellowships and career development awards. www.niaid.nih.gov/biodefense/research/funding.htm.

NIH Re-entry Program. The NIH and Office of Research on Women's Health announce a continuing program for faculty who have taken time out for family responsibilities. http://grants.nih.gov/grants/guide/pa-files/PA-04-126.html.

NIH Grants.

- Large-Scale Collaborative Project Awards. http://grants2.nih.gov/grants/guide/pa-files/PAR-04-128.html. Deadlines: September 20, 2006, and June 21, 2007.
- Predoctoral Research Training in Biostatistics. http://grants2.nih.gov/grants/guide/pa-files/PAR-04-132.html. Deadline: October 12, 2007.
- NICHD support of human embryonic stem cell research. http://grants1.nih.gov/grants/guide/notice-files/NOT-HD-05-011.html, http://grants1.nih.gov/grants/guide/notice-files/NOT-HD-05-011.html.

MEETINGS Calendar

ASCB Annual Meetings

2006
San Diego
December 9-13

2007
Washington, DC
December 1-5

2008
San Francisco
December 13-17

2009
San Diego
December 5-9

2007
Washington, DC
December 1-5

2008
San Francisco
December 13-17

May 2-3. Bethesda, MD
Bone Quality: What Is It and Can We Measure It? www.asbmr.org/bonequality.cfm.

May 16-17. Bethesda, MD
Cellular Niches Workshop sponsored by NIDDK/NIH/DHHS. http://cellularniche.niddk.nih.gov.

May 23-25. Charlottesville, VA
Morphogenesis and Regenerative Medicine Symposium at the University of Virginia. www.morphogenesis.virginia.edu.

June 5-9. Atlanta, GA
American Society for Microbiology General Meeting. www.asm.org.

June 10-22. Vancouver, BC
Eleventh Annual International 12-Day Short Course on 3D Microscopy of Living Cells. Applications due March 15. www.3dcourse.ubc.ca/application.htm.

June 24-26. Vancouver, BC
Tenth Post-course Workshop on 3D Image Processing. Applications due March 15. www.3dcourse.ubc.ca/application.htm.

July 13-17. New York, NY
Second International Symposium on Triglycerides, Metabolic Disorders and Cardiovascular Diseases. www.lorenzinifoundation.org/.

July 15-18. Boston, MA
Stem Cell Niches. ASCB Summer Meeting. www.ascb.org.

July 20-23. Atlanta, GA
The Cell Biology of HIV-1 and Other Retroviruses. ASCB Summer Meeting. www.ascb.org.

September 1-5. Muensterschwarzach Abbey, Germany
The Wilhelm Bernhard Workshop–19th International Workshop on the Cell Nucleus. www.zeb.biozentrum.uni-wuerzburg.de/.

October 28-31. Beijing, China
The 5th Asian-Pacific Organization for Cell Biology Congress (APOCB 2006). http://www.apocb2006.org.cn/index.htm.

September 3-7. Dresden, Germany
European Life Scientist Organization Annual Meeting. www.elso.org.

September 3-7. Sydney, Australia
15th International Society of Developmental Biologists Congress (ISDB). www.isdb2005.com.

September 7-11. Cambridge, England
Strategies for Engineered Negligible Senescence (SENS), 2nd Conference. www.gen.cam.ac.uk/sens2/.

September 23-23. Nashville, TN
American Society for Bone and Mineral Research 27th Annual Meeting. Abstract Deadline: April 27. www.asbmr.org. ■

THE AMERICAN SOCIETY FOR CELL BIOLOGY

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