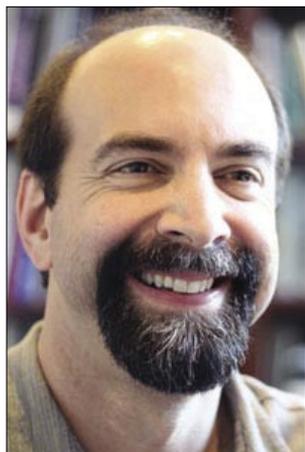


Tim Stearns



Tim Stearns

It was welcome news to David Drubin that his old friend, former labmate, and current Stanford faculty member Tim Stearns had just accepted the Chair of the ASCB Education Committee. “It’s absolutely perfect for Tim,” says Drubin. It’s a perfect match for the ASCB, because of Stearns’ unflinching commitment to teaching as essential to research, Drubin adds.

“First and foremost, when I think of Tim Stearns, I think of a gifted teacher,” says Drubin, who is now at the University of California, Berkeley. According to Drubin, although Stearns is a first-rate researcher, he has always seen himself as an educator/researcher: “A lot of people who take this career path give the teacher part a lower priority than the researcher part. Not Tim.” Teaching is a real passion that Stearns sees as integral to his research and scholarship.

Drubin met Stearns when he was a graduate student in David Botstein’s lab at the Massachusetts Institute of Technology (MIT). Drubin recalls, “Tim says David Botstein infected him with the idea that research and teaching go hand in hand. I don’t want to take anything away from David, but in the Botstein lab, on a day-to-day basis, it was Tim who taught me yeast genetics.”

David Botstein also says that his former graduate student is the better teacher. “My favorite line is that Tim gives my lectures better than I do, which is not true. Actually, Tim gives them better than I ever did,” asserts Botstein.

Teaching Advances Research

Botstein decries the urban myth that being a great teacher comes at the expense of being a great researcher. He argues that the reverse is true. “Serious teaching of the fundamentals of your discipline,” Botstein points out, “often improves your understanding of where your research ought to be going.” He says that Stearns’ career proves his point.

Stearns is “appropriately best known” for his work on gamma tubulin and the identification of other tubulin starter subunits in the centrosome organizing center, according to

Botstein. “Other people are always involved in these things, and there’s always a lot of competitive ‘hoo-hah,’ but Tim was clearly a major player.”

Stearns is also known as a major player in the national effort to revamp undergraduate biology education. In 2002, Stearns was named one of the first 20 Howard Hughes Medical Institute Professors for his proposal to create a “pregrad” program for Stanford undergraduates turned off by the stifling premed focus of most biology programs. “The feeling of being on the edge of the unknown is what research is all about,” Stearns explains. To get that feeling, his pregrads are steered away from the “cookbook” lab course that most biology majors take, and into a lab course he teaches with Stanford colleague Martha Cyert. They work on “real experiments, with modern technology,” discovering how toxic compounds in the environment affect cells.

“Undergraduates get turned on to experimental science by having a good research project experience and by seeing what it’s like to be a scientist through exposure to the social environment of the lab,” Stearns says. “One

of the great failings in how we teach science to undergraduates is that they come away with the idea that science is done by lone eccentrics,” he continues. “We, practicing scientists, know that at least the ‘lone’ part isn’t true.”

“The supposed split between research and teaching is a dangerous illusion,” says Stearns.

He points out that people don’t have a basic understanding of many of the things in their daily lives, even ancient technologies like radios and refrigerators. “How many people understand how cell phones work? How the Internet works? People are surrounded by things that they don’t understand, so it’s become acceptable to not understand how things work.”

“But that’s not acceptable in a science-driven society,” says Stearns. “As scientists, we have failed to educate the public so that people can understand the issues in modern science.” He adds, “this problem has implications at every level from K–12 right up to graduate school.”

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Stearns, who has chaired the Education Committee of the Genetics Society of America, believes that the ASCB has both greater reach and more experience in making itself heard on science policy issues. “The ASCB is a much larger society, and it’s been particularly successful in promoting science and education nationally,” says Stearns. “I’d also like to increase awareness within the Society of what so many ASCB members are already doing to improve science education.”

Learning How Things Work

Stearns’ own science education was a bit roundabout. He was born and grew up in Huntington Station, Long Island, not far from Cold Spring Harbor Lab. His parents had no science background, and Stearns says he grew up completely unaware of the famous laboratories just down the road. His father, though, was a dedicated amateur motorcycle racer. Helping his dad, and then racing dirt bikes himself, Stearns admits that, “I spent a lot of my youth breaking motorcycles on weekends and fixing them during the week.” He concludes, “I think that was the start of my obsession with finding out how things work.”

In college, Stearns was attracted to the logic of genetics as a means of finding out how things worked. However, he ended up in research science, he says, because he joined a lab out of economic necessity. As an undergraduate working his way through Cornell, Stearns landed a work-study position in the yeast genetics lab of Tom Fox. His job was to crank out plasmid DNA, but Stearns was soon drawn into the experimental and social life of the Fox lab, and to his own research project on mitochondrial function. “It was a relatively young lab and it was exciting for an undergraduate to see what science looked like,” Stearns recalls. “It was exactly the kind of experience that turns undergraduates on to science.”

Another job at Cornell—a stint as a cook at Ruloff’s, a legendary Ithaca pub-restaurant named for a 19th century polymath and murderer who was the last man hanged in New York State—is where Stearns met his future wife, Susan Cleveland. Cleveland is a social worker who has gradually shifted from traditional casework to medical research. Today, Cleveland manages outreach for a Stanford twins study into the genetic basis of autism.

Stearns left Cornell with ringing endorsements from Fox and a handful of graduate school acceptances. A visit to MIT and an intense conversation with David Botstein settled the question of which school to attend, Stearns recalls with a laugh. “One hour with

David and I was completely convinced that I had to go to MIT.”

From Botstein to Kirschner

Stearns loved the variety of the Botstein lab. At the time he arrived, work was proceeding simultaneously on the tubulin cytoskeleton, the actin cytoskeleton, gene regulation, protein secretion, and human genetics. Stearns took over the bench of David Page, whose lab at the Whitehead Institute is known today for its work on the Y-chromosome. “Right next to my yeast plates were Page’s old Southern blots of various primates, orangutans, chimps, and gorillas,” Stearns says. “It just shows what a remarkable mix there was.”

In the Botstein lab, Stearns learned about yeast genetics, screening for mutants affecting the microtubule cytoskeleton. He also met David Drubin, who was starting his postdoc after earning his Ph.D. in cell biology working with Marc Kirschner at the University of California, San Francisco (UCSF). Stearns and Drubin both remember sparring good-naturedly over the powers and limits of their respective disciplines. The debate was not limited to the Botstein lab, Stearns recalls. “During the mid-1980s, geneticists were trying to learn something about cell biology, while cell biologists and biochemists were trying to understand how genetics had anything to do with what they were working on.”

That schism began to close in the late 1980s, says Stearns, about the time he went west for a postdoc. At Drubin’s strong suggestion, Stearns went to Kirschner’s UCSF lab to learn some “real” cell biology. “I think Marc was running an ‘affirmative action’ program for yeast geneticists,” Stearns jokes. The Kirschner lab was another wonderfully exciting, three-ring scientific circus. Stearns shared his first lab room with Vladimir Gelfand, Ray Deshaies, and Andre Brandli, all four of them working in different fields.

In the Kirschner lab, Stearns discovered that gamma tubulin localized to the centrosome’s organizing center, following up on Berl Oakley’s identification of this new tubulin.

Bearing Fruit at Stanford

In later work at Stanford, Stearns added delta and epsilon tubulin to the cast of tubulins in the centrosome. The known complexity of the centrosome has increased, says Stearns, but the research question is still the same: “At the heart of it is trying to understand how cells are organized.” He continues, “All cells have polarity

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and it’s usually imparted by the cytoskeleton. If you look at the microtubule cytoskeleton, it’s remarkable how polarized it is.”

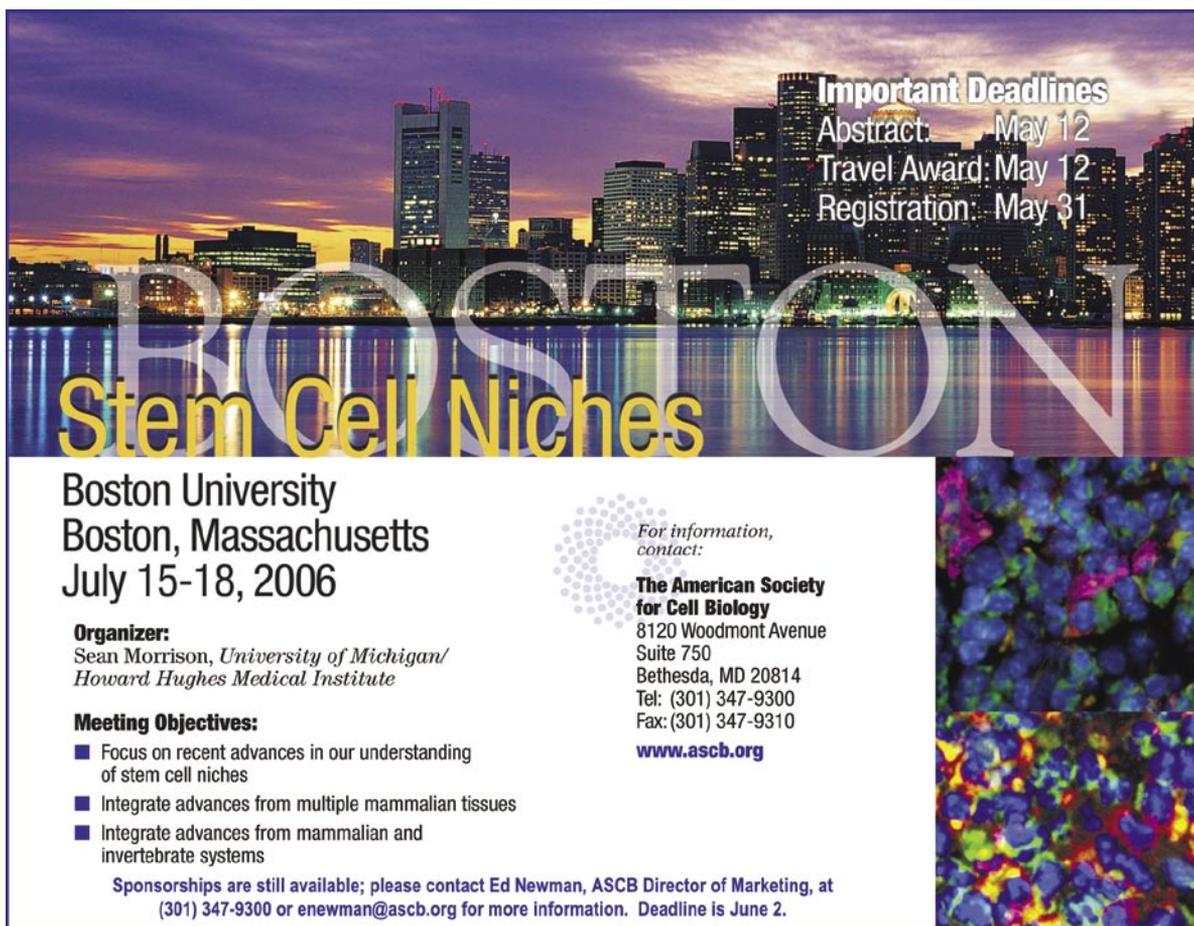
Becket Feierbach was one of Stearns’ first graduate students after he joined Stanford in 1993. “Choosing a brand-new faculty member for a mentor can be risky,” Feierbach says, “but choosing Stearns was a no-brainer. He is just a phenomenal teacher,” she says. “Tim has this practical down-to-earth teaching style, so I knew immediately that I would learn bench work because it would be Tim teaching me.” Now a postdoc at Princeton, Feierbach says she models her teaching style after his. “I have no idea if I come anywhere close,” she says, “but I use Tim as a model of how to teach both in the classroom and at the bench.”

“Stearns’ skill as a teacher shouldn’t overshadow his success as a researcher,” Feierbach asserts. “A natural communicator is a natural collaborator. Go through Tim’s publications and you’ll notice that he’s collaborated with David Botstein, Bob Palazzo, Nick Cowan, Steve Doxsey, Ron Davis, Mark Winey, Jim Haber, James Nelson, and Peter Jackson. The list goes on.” According to Feierbach, Stearns would continually come home from meetings with new protocols and new collaborators. “He’s completely unafraid of new technologies,” she says.

Stearns is also unafraid of older technologies, particularly musical ones. By all reports, Stearns is highly accomplished on the guitar, mandolin, saxophone, and violin. His passion is American traditional music and jazz from the 1930s and 1940s, music he often performs with Steve Block, a Stanford biophysicist and top-notch banjo player. “We’ve been paid to play a few times,” says Stearns, “about enough money to buy lunch.”

Stearns and Cleveland live in a small house on a large lot in Redwood City. It’s home to Stearns’ collection of exotic musical instruments, including his home-built theremin, the world’s first electronic musical instrument. At a lab staff party, Feierbach recalls, “Tim played us something on the theremin. It was one of the funniest and spookiest things I’ve ever heard. Then we all had a turn on the theremin and it was awful.”

Outside their house, Stearns and Cleveland tend a large orchard planted decades before by Jack Hensill, a Stanford grad student in the 1940s who went on to become Dean of Natural Science at San Francisco State University. About 50 trees bear every variety of fruit imaginable. Says Feierbach, “Any other person would have bulldozed the whole thing and built a 5,000-square-foot McMansion, but Tim preserved it all.” ■



Important Deadlines
Abstract: May 12
Travel Award: May 12
Registration: May 31

BOSTON
Stem Cell Niches

Boston University
Boston, Massachusetts
July 15-18, 2006

Organizer:
Sean Morrison, *University of Michigan/Howard Hughes Medical Institute*

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- Integrate advances from mammalian and invertebrate systems

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