

David J. Asai

David Asai's "Mr. Sperm" lecture was intended to be memorable, and Kathy Foltz recalls it vividly. Foltz is now an associate professor at the University of California, Santa Barbara (UCSB). But in the mid-1980s, she was a green graduate student in Asai's lab at Purdue University in Lafayette, IN, and the teaching assistant for his cell biology lecture course.

First, says Foltz, you have to understand that Asai always stood out at Purdue. There was his hard-driving, motor protein research lab, his passion for undergraduate teaching, and his natural skills as a lab mentor. And there was his wardrobe, says Foltz. Asai was a California guy, she explains, always in shorts, t-shirt, and flip flops. His only concessions to Indiana winters were tennis shoes and a parka that came down below his shorts. Once in the lab, he changed to his usual attire.

Then came his lecture on flagellar motility, Foltz recalls, "He walks into the classroom with 200 undergraduates and he's dressed as a sperm." Actually, Asai was costumed as a sperm cell with a 10-foot-long flagellum trailing him to the lectern. "He would never crack a smile," Foltz remembers. "He was totally serious. His students didn't know what to think." Discussing the axoneme, the structural core of the flagellum, Asai reeled in his own tail to demonstrate. "He had this cross-section to scale where he could crack it open and show them the axoneme with the 9+2 [arrangement of microtubules] structure," Foltz explains. "It was just an awesome teaching tool. David can come across as very reserved, but the guy was nuts when it came to this sort of thing."

The reason is simple, says Foltz. "David has never cared for what other people think. He just wants to do the right thing. He's convinced that the health of science is completely dependent on

what we do at lower levels, launching students with good training and an understanding of the scientific process. And he's put his money where his mouth is on that."

Hanging Up

In August 2008, Asai hung up his Mr. Sperm suit, ending a nearly 24-year faculty career of teaching and research, first at Purdue and then

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at Harvey Mudd College in Claremont, CA, to become the Director of the Precollege and Undergraduate Science Education Program at the Howard Hughes Medical Institute (HHMI) in Chevy Chase, MD. The HHMI program that Asai now directs is the largest private funding source behind the reform of America's creaky undergraduate teaching apparatus. HHMI demonstrated its leadership again in May with the announcement of \$79 million in new grants, running the tab for HHMI support of science education reform to \$1.6 billion since 1985.

For those who know Asai, the HHMI post sounds like a dream job, the perfect match for a research scientist who never shied away from teaching and mentoring. Only half in jest, Carol Greider of Johns Hopkins University School of Medicine offers herself as

an illustration of Asai's talents as a mentor. With Liz Blackburn, Greider won the 2009 Nobel Prize in Physiology or Medicine for their work on telomeres. In 1983, Greider was an undergraduate at UCSB and the first student ever officially mentored by Asai. They were in Les Wilson's biochemistry lab. Asai was a postdoc and Greider a senior just back from a year in Germany. It was Greider's second undergrad tour in the Wilson lab (as a sophomore, she'd worked with grad student Kevin F. Sullivan, now at the National



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University of Ireland, Galway). Today Asai laughs off any notion that he steered Greider to Stockholm, but Greider insists that interacting in a research environment with collegial guides like Asai and Sullivan was important. It brought her to the sense that, "Hey, this is where I belong. Also getting into biochemistry there showed me the mechanistic way that my mind worked."

Those Santa Barbara days came alive for Greider at a recent meeting in the Washington, DC, area where Asai turned up with her 1983 lab notebook. Greider shook her head at the sight. "I was surprised that I could keep a laboratory notebook back when I was an undergraduate," she reports. The notebook also brought back memories of working with Asai. There was his uniform of shorts and flip flops. "I mean, even at Santa Barbara, it gets cool once in a while." But what stands out most for Greider was Asai's way of taking undergrads seriously. "Plus his sense of humor made it a lot of fun. He showed me that you could joke about science. That was infectious."

His California dude image aside, David Asai was actually born in Chicago. He was adopted as a baby by Sadaichi and Marian Asai, Japanese-Americans from southern California whose lives were torn up by internment during World War II. They met in a camp in Poston, AZ, securing their release by agreeing to relocate to Albion, MI. There his father, who had a degree from the University of California, Berkeley, became a janitor in a children's home. After the war, his father enrolled in a Congregationalist seminary just outside Boston to pursue his vocation as a minister. "By the time I caught up with them," Asai recalls, "they were living in Vermont," where his father had his first small rural church.

Looking Like Us

Other pulpit jobs took the family, which now included his adopted younger brother, Paul, to Kansas and finally to Hawaii. From the sixth grade through high school, Asai lived on what was then the very rural and remote island of Maui (which Asai is careful to point out gives him no claims to being a "kama'aina," one who is born and raised in Hawaii). "Until we moved to Maui, my brother and I had been the only two non-whites in the whole school. Suddenly on Maui a lot of people looked like us. At first, it felt like a foreign country." Those memories of being out of place and of his parents' struggles against ethnic prejudice shaped Asai's belief that full minority participation in American science is critical to its future.

His personal scientific turning point came through a National Science Foundation (NSF)-funded program that brought high school students to Oahu for a summer research program at the University of Hawaii. Oahu was the big city after Maui. Living in a dorm, working into the night at the bench, and hanging out with grad students at all hours was intoxicating. After that, the lab life was the only way to go.

When Asai moved to the mainland to enroll at Stanford, he headed for the research buildings, securing lab placements straight through four years and three summers. Outside the lab, Asai says he was a "lousy student" who rarely studied and devoted himself to campus politics. Fortunately his GRE scores and his long résumé of lab experience persuaded the California Institute of Technology's Biology Division to take him as a graduate student. His 1979 thesis on the use of antibodies to dissect flagellar motors combined the approaches of his two mentors, Charles Brokaw's cell biology and Ray Owen's immunology.

By the time Asai arrived in Santa Barbara for a postdoc in the Wilson lab, the postdoc in the lab next door recalls, "David was a cell biologist before I even knew what a cell biologist was." That postdoc was Kerry Bloom, now at the University of North Carolina, Chapel Hill, who remembers that Asai was always known as someone who took undergraduate mentoring seriously.

But Asai was also a first-rate researcher, says Bloom. Later at Purdue, the Asai lab pioneered new methods and new model organisms for motor protein research. Even at Harvey Mudd, a small science and engineering college where his lab was staffed completely by undergrads, Asai transformed *Tetrahymena* into a tractable model system for studying dynein. "As much as I tout yeast as a system," Bloom explains, "it's no good if you're interested in all the isoforms of dynein because there's only one form in yeast." The Asai lab demonstrated that *Tetrahymena* expresses 25 different dynein heavy chain isoforms. But building a model system with reagents and solid genetics takes work, says Bloom. "It's a major slog," says Bloom "but the work is hugely important in a system if you want to knock down different ones and study *Tetrahymena* in a knowledgeable way. David was doing all the biochemistry and all the genome stuff."

Labs and Labs

Asai admits that moving from a California campus to a Maryland headquarters required

adjustments. Today he and his black Labrador Cleo live near Rock Creek Park within walking distance of HHMI. He had forgotten the frigid Eastern climate until this winter's DC blizzards reminded him. Still, what he misses most is the direct contact with students. Shutting down a lab—or in this case transferring its reagents, cell lines, equipment, and NSF grant to a former postdoc David Wilkes, now at Indiana University, South Bend—was hard. Your lab is your identity as a scientist, says Asai, and the daily hub of your life. Asai says he also misses the competitive side of science—the race to get results, to publish first, and to get grants renewed. “I guess I’m on the other side now, helping to decide who gets their grant funded.”

His new post at HHMI gives him a singular vantage point on American science. “HHMI has always been about supporting the best science and the best scientists. Our program aims to support the best science education and the best educators.” Hard economic times have forced cuts even at HHMI, says Asai, yet HHMI has never had the luxury of spreading its resources across every worthy program in the country.

HHMI has to pick the best and provide enough resources to have an impact. “I think it’s also important that we have the potential to be more

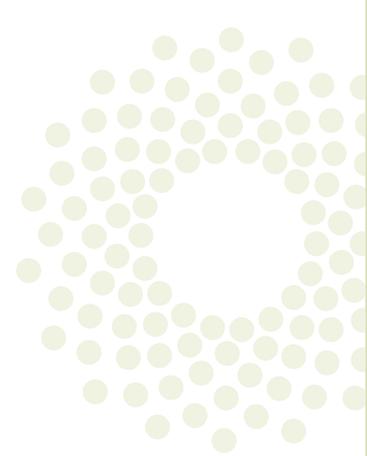
nimble in putting resources on problems more quickly than any other institution or even a small college,” Asai explains. “Besides, from time to time, we get to do some pretty cool stuff.”

Back at UCSB, Les Wilson brushes off any credit whatsoever for Greider’s Nobel or Asai’s HHMI eminence. Greider was clearly headed for great things, Wilson says, and Asai’s educational focus was always evident. Wilson even has a citation to support his statement. Asai edited a 1993 volume of *Methods in Cell Biology* on monoclonal

antibodies. He dedicated it to two of his mentors at Caltech, Ray and June Owen. Wilson reads Asai’s dedication aloud, “Ray conveyed to me the wonder of the immune response. June provided valuable perspectives on life and science. And together they convinced me that work such as what went into the editing of this volume is only worthwhile if it benefits young people.” ■

—John Fleischman

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2010 E.E. Just Lecturer Is Tyrone Hayes



Tyrone B. Hayes

The ASCB Minorities Affairs Committee has named Tyrone B. Hayes to present the 17th annual E.E. Just Lecture on December 12, 2010, at the ASCB Annual Meeting in Philadelphia, PA. Hayes is a professor in the Department of Integrative Biology at the University of California, Berkeley.

Hayes’s research focuses on the role of steroid hormones in amphibian development. He conducts both laboratory and field studies in the U.S. and Africa. His two main areas of interest are metamorphosis and sex differentiation, but Hayes is also interested in growth (larval and adult) and hormonal regulation of aggressive behavior. Hayes’s work addresses problems on ecological, organismal, and molecular levels.

Committed to the professional development of each student in his laboratory, Hayes works tirelessly to ensure that each student is trained to conduct the highest caliber science. He is also the recipient of the Distinguished Teaching Award from University of California, Berkeley. ■