

[<< back](#) 

2003

Fred Chang

In 1984, Chang was a first year MD/PhD student at UCSF who was tired of dry medical school lectures and wandered into the lab of the late Ira Herskowitz. He never looked back. Interested in studying cancer using yeast genetics, Chang examined how a negative growth factor (alpha-factor) causes cell cycle arrest in budding yeast. He identified FAR1, a gene product that turned out to be one of the first cell cycle inhibitors.

As his mentor, Chang says Herskowitz gave him the values of clear thinking and teaching as well as the confidence to think for himself. Chang and Herskowitz also shared another passion: music. "Ira was a great blues guitar player," says Chang. "My musical background is classical so we never got to play together. But Ira was always supportive of my music life outside the lab."

The recent death of Herskowitz fell particularly hard on his students, past and present. In this, Fred Chang is far from alone. It's been eleven years since Chang left UCSF, "but I'm still learning from Ira every day," says Chang.

These days Fred Chang is best known to colleagues as a rising virtuoso of yeast cell biology. The Chang lab at the Columbia College of Physicians and Surgeons in New York quickly made its mark with innovative combinations of *S. pombe* genetics, biochemistry, and dynamic microscopy, according to Boston College's David Burgess. Chang is interested in questions of spatial organization, such as how a cell decides to divide in the middle. His lab studies cytokinesis, cell polarity and nuclear positioning in fission yeast. With an interest in the interactions between microtubules and actin, he has turned towards studying the formins, a group of proteins with an ever-expanding role in cytoskeletal dynamics and integration.

Yet few of his colleagues realize that Fred Chang is also a virtuoso on the violin. The demands of starting a lab and fatherhood forced Chang off the stage when he moved to New York, but last summer Burgess was lucky enough to hear him perform again. The occasion was an impromptu chamber music concert in the Marine Biological Lab cottage where the Changs and their two children spent the summer at Woods Hole, Massachusetts. "Fred's wife, Lani, is a professional violinist in New York," Burgess explains, "and she'd invited some of their musician friends up from the City."

The music, the informal setting, and the performance level were amazing. Fred Chang's playing also reminded Burgess of Chang's science—professional, creative, and not widely enough recognized. "Fred is a quiet person who doesn't blow his own horn too much," says Burgess, "but I consider his lab a leader in combining genetics with cell biology-imaging techniques to study cell division and nuclear positioning. His work on formins and Arp2/3 really stands out. And then this recent work on actin-polymerization during cytokinesis was an imaging and biochemical tour de force. It was a totally novel finding that surprised many of us. The unexpected part is that Fred showed that actin is undergoing dynamics and polymerization during contraction of the contractile ring. That forced many of us to rethink some old conceptions."

Bruce Goode of Brandeis University agrees: "Fred is one of those people who it took me a while to get to know, but I am so glad I did. He is a great friend and colleague, whose advice I frequently call on." Since their days as post-docs together in David Drubin's lab at UC Berkeley, Goode has watched Chang soar. "Fred comes from a yeast genetics background," says Goode, "but when he started his own lab at Columbia, he transformed himself into a cell biologist. He took microscopy to another level by tracking the movements of GFP-labeled structures in cells and combined this approach with genetics to dissect the events regulating cell polarity and cytokinesis."

Chang is a native Californian, raised in Palo Alto where his father was a Silicon Valley engineer and his mother a medical lab technician. Music—he plays both the violin and the viola—and science always came easily to him although Chang never saw them as conflicting. As a Princeton undergraduate, Chang balanced academics with an active music schedule. In his junior year, he became turned on to molecular genetics research, first by Dale Kaiser at Stanford working on Myxobacteria, and then with Austin Newton at Princeton, studying *Caulobacter*. These experiences tipped him towards the MD/PhD program at UCSF in 1984. Ira Herskowitz solidified his commitment to the laboratory.

But Chang never stopped playing. As a graduate student, he performed in four orchestras and a piano trio and soloed in numerous concertos. While playing in the San Francisco Concerto Orchestra, he met its Concertmaster, Lani King, a professional violinist. They were married in 1992. Fred took his double degree that year and started his post-doc in Paul Nurse's ICRF lab in Oxford, moving with the lab to London a year later. Working in fission yeast, Chang began looking for the 8 The ASCB Newsletter, Vol 26, No 7 key players in the formation of the actin contractile ring that pinches a dividing cell into two.

While in England, Fred and Lani shared a stand in the Apollo Chamber Orchestra, a young professional orchestra. In 1995 and 1996, the family oscillated between London and Berkeley to accommodate Lani's schedule with the San Francisco Opera. While in Berkeley, Fred continued his project with David Drubin, who taught him about the cytoskeleton and biochemistry. By the end of 1996, Fred had new cytokinesis genes, two young children and a job offer from Columbia.

Chang, who has been an ASCB member since 1995, joined the editorial board of the Society's journal, *Molecular Biology of the Cell*, last year.

Today, the family lives in the Westchester suburbs where Clara, 9, plays the piano and Simon, 7, plays the cello. Lani is on the faculty of the Hoff-Barthelson School of Music and freelances in New York City. Fred now plays only occasional chamber music concerts, but especially enjoys performing as part of the Chang family quartet. Summers at MBL allow the Changs to settle into new routines of playing with microscopes and sea urchins in the lab, beach, practice and Science School. With many friends happy to visit the Cape with instruments in hand, the Changs are hoping to expand these informal musical gatherings into a Woods Hole chamber music series.

"For me, playing music and doing science are similar activities which mix creativity with intellect," says Chang. "In music, I strive to sing with an honest, refined voice that clearly articulates the structure of the music as well as reflects a bit of individual soul. Another thing I strive for is to find connections between the lines. In music, you have instruments playing different lines when suddenly they interconnect. I've always enjoyed looking for those unexpected relationships and that's very much a part of my science as well."