



Karen Oegema

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Karen Oegema is only half-kidding when she says, “Basically, I was born with a pipette in hand.” In truth, the pipette didn’t come to hand until high school, when she first worked in her father’s research lab at the University of Minnesota Medical School. “But my parents were always very encouraging,” Oegema recalls. “It was almost assumed that I was going to be a scientist.”

Oegema didn’t resolve the question of what kind of scientist until later. “When I went to Caltech, I was trying to do something a little different than my dad,” Oegema recalls. “I was interested in physics and math, so I was majoring in chemical engineering.” Then she found out about entry-level jobs in chemical engineering. “I had a friend who was watching bubbles rise through glycerol all day. Another was collecting hamburger emissions off the roofs of fast food restaurants. I decided to do something more like what my dad was doing.”

Fortunately, that was cell biology. After earning a doctorate at the University of California, San Francisco (UCSF), and completing a postdoc in Germany, Oegema set up her own lab in 2003 at the Ludwig Institute for Cancer Research in San Diego.

The Ludwig post came with a joint appointment in the Department of Cellular and Molecular Medicine at the University of California, San Diego Medical School. The Oegema lab, which studies centriole duplication and cytokinesis, is built around a *C. elegans*-RNAi screening system. She helped pioneer the approach during her postdoc in Tony Hyman’s Max Planck Institute (MPI) lab in Dresden. In San Diego, Oegema’s discovery of seven novel proteins—five of which have human homologs—involved in centriole duplication was cited as “pioneering research in a fundamental area of cell biology,” by Stanford’s Suzanne Pfeffer. Pfeffer nominated Oegema for the ASCB’s 2006 “Women in Cell Biology” (WICB) Junior Career Recognition Award. (Oegema was a co-WICB awardee with Suzanne Eaton of MPI Dresden.)

Part Biologist, Part Engineer

In seconding Oegema’s nomination for the WICB junior award, Tim Mitchison described Oegema as “part biologist, part engineer.”

Wrote Mitchison, “She is willing to invest time and energy into solving technical problems and optimizing methods, which she does more effectively than anyone else I know.... That said, [Oegema] isn’t just a skilled experimentalist. She has a strong grasp of the big intellectual challenges in modern cell biology.”

Mitchison, who is now at Harvard Medical School (HMS), took over as Oegema’s thesis advisor at UCSF after Bruce Alberts left for Washington, DC, in 1995 to become President of the National Academy of Sciences. Many graduate students would have been flummoxed to see their original advisor depart in mid-thesis, but as Mitchison notes, “Karen was already quite independent.”

That is a major understatement, according to Oegema’s UCSF peers, including Christine Field, now at HMS. Field says that Oegema’s formidable math and engineering skills gave her instant authority, even as a graduate student in the Alberts lab. “Karen was the most analytical, rigorous, and critical of all of us, so if Karen thought our data were strong, then we felt quite good about it,” says Field.

Never the Obvious Way

Oegema was never satisfied with doing something the most “obvious, straightforward way,” Field recalls. At the time, Field was working on a protein complex involved in cytokinesis, obtaining the proteins through an easy, one-step purification process. “Then Karen decided that maybe we could learn something new if we did a traditional multi-column preparation,” Field remembers. The laborious multi-column prep revealed two different protein populations. That’s still typical of the Oegema approach, Field believes. “Karen really wants the full story, and the full story is going to be complex. She’s good at simplifying things for quantification, but she never wants to gloss over complexity. She really wants to understand the whole process.”

Another veteran of the Alberts lab—Jordan Raff—now with Wellcome/Cancer Research UK in Cambridge, England, says that Oegema’s analytic strengths were clear from the start: “Karen has to see it for herself.” According to Raff, nowhere was Oegema’s “see-it-to-believe-it” mindset more vividly demonstrated than in

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a practical joke played on her by Doug Kellogg, another Alberts lab member. It involved a brand-new Mac computer delivered to Oegema's work bench that sat untouched for days while she tended to more pressing matters. One evening, Kellogg opened the bottom of the box with a scalpel, carefully removing the new Mac, and replacing it with an old power supply unit, before resealing the bottom. Raff explains, "In those days, Macs came with a packaging seal that said something like, 'If you break this seal, you've bought this computer.' A few days later, Karen finally gets around to unpacking her new computer and there's this rusty old power supply. She fell for it, hook, line, and sinker. She didn't think Apple would believe her story. But that's exactly her strength," says Raff. "She only believes what her eyes tell her. Plus she never gives up."

Michigan Roots

Karen Oegema was born in Holland, Michigan, a lakefront town on the western side of the state that "was about 99 percent Dutch when I was a kid," she recalls. "We even had a real windmill donated by the Dutch government." Her mother, Carol, was a registered nurse. Her father, Theodore R. Oegema, Jr., was a Ph.D. student in biochemistry at the University of Michigan in Ann Arbor, where the family soon moved. When Karen was eight, her father took a joint appointment in Orthopedics and Biochemistry at the University of Minnesota Medical School. (Her father, a renowned expert on cartilage carbohydrate biochemistry and its relationship to osteoarthritis, is now chair of the Biochemistry Department at Rush Medical School in Chicago.)

Karen and her younger brother, Jeff, grew up outside Minneapolis in the suburb of Fridley. Both Oegema children were extremely good in math. Jeff Oegema later studied Information Technology. He now lives in Dresden, Germany, according to his sister, because she recommended him to Hyman's MPI lab group as the solution to its data-crunching problems. In San Diego, Karen Oegema holds her forehead and laughs. "It's true. I left my brother in Germany and moved back."

Brushing aside her math and chemistry grounding, Oegema claims that she went to Caltech because as a female engineering student, she was a shoo-in there for a scholarship. She also claims she choose the Alberts lab at UCSF because, "It was the craziest place I'd ever seen." There were dart tournaments in the lab, "performance art" in the water baths, and "primal scream" sessions in the cold room. There was also amazing science going on, day

and night, Oegema remembers. In the Alberts lab, Oegema added biochemistry and genetics to her background in math and physics. In the combined Alberts-Mitchison lab, she finished her doctorate in 1996.

A UCSF Who's Who

The labs inside the ramshackle UCSF high-rise research tower were at the center of the cell biology revolution in the 1980s and early 1990s. The list of UCSF faculty, postdocs, and grad students from this period is a Who's Who of modern cell biology. A very partial list would include Alberts, Mitchison, Marc Kirschner, Andrew Murray, Rong Li, Tony Hyman, Harold Varmus, Mike Bishop, Ira Herskowitz, Kathy Wilson, Keith Yamamoto, Peter Walter, and Yixian Zheng.

Add another name to that list: Arshad Desai. Oegema met her future husband on the "night owl" shift in the combined Alberts-Mitchison lab. By the time Mitchison moved his lab to Boston in 1996, Oegema and Desai were a couple, but with differing long-term interests. Desai needed a yeast lab to pursue his work on kinetochores. Oegema needed a *C. elegans* lab to pursue her growing interest in cytokinesis, the pinching off of the cytoplasm into separate sister cells during late-stage mitosis. Mitchison said that the best place for them would be with his former postdoc, Tony Hyman, in Germany. But Desai, who is from India, needed to regularize his U.S. immigration status first. So for two years, Oegema was a commuting postdoc, shuttling between Mitchison's lab in Boston and Yixian Zheng's at the Carnegie Institute in Baltimore. Zheng had the fly cages she needed, Oegema explains.

From Heidelberg to Dresden

Finally in 1998, Oegema and Desai joined Hyman's lab at the European Molecular Biology Laboratory in Heidelberg, Germany. Hyman was opening up a new *C. elegans* section in what had been a yeast-based lab. He hoped to take advantage of new RNAi techniques to screen the *C. elegans* genome. In the midst of the project, Hyman moved his entire lab from Heidelberg in western Germany to Dresden in the newly unified East Germany. The Hyman lab would be a cornerstone of the new Max Planck Institute for Molecular Cell Biology and Genetics there.

The move was a masterpiece of Hyman's planning and German efficiency, recalls Oegema. Everything had been thought of—from freezer trucks to move specimens to back-

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up freezer trucks, should the first trucks break down on the trip east. “Essentially we moved into a brand new building and got down to work again two weeks later. The biggest complaints were about things like the coffee machine.” The move was a lesson for Desai and Oegema, she explains. “Watching Tony organize the move was great for Arshad and myself. You can learn a lot just by watching, and I think it really helped us set up our own labs.”

They went on the job market together in 2001 and, despite the perils frequently faced by married couples in search of double offers, Oegema says they were lucky enough to have real choices. The Ludwig Institute and UCSD won out for a number of reasons, she recalls, but UCSD offered her one extra advantage. “Women do better here. The science here is excellent and yet it’s slightly less stressful. Elsewhere there’s this pressure that if you’re a woman, you either have kids or you have a scientific career. UCSD is not like that.” Oegema also liked the strong female leadership at UCSD and adjoining institutions in the San Diego area provided by senior faculty such as Sandy Schmid, Susan Taylor, and Marilyn Farquhar.

A Kid-Friendly House

Desai and Oegema live in nearby La Jolla. Since the birth of their son, Khalil, in early 2004, their nonscience lives are almost totally centered on Khalil, says Oegema. San Diego is full of kid-friendly attractions, from the beach to the zoo. At home, she enjoys cooking, reading, and indulging her husband’s passion for obscure art films on DVD.

At their campus labs, Oegema reports, “We’ve definitely maintained our distinct identities. My lab is really about the *C. elegans* system and using it to study cell division. His lab is really about how kinetochores function in chromosome segregation.” Yet they have collaborated in the past and even now deliberately mix their people and their space, Oegema says. It’s a matter of trust, and, sometimes, self-interest. “When you’re married [to another researcher], you have to decide if you want to work with each other or even if you can,” Oegema believes. “But basically there is only one person in the world whom I would trust to touch my experiments and that would be Arshad.” ■



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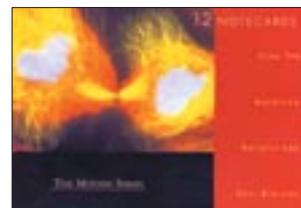
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