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Fiona Watt

Fiona Watt has all the responsibilities of a senior cell biologist plus three more. Watt is a Principal Scientist at the CR-UK London Research Institute, the current President of the British Society for Cell Biology, and long-time Editor-in-Chief of the *Journal of Cell Science*. She is also the mother of 10-month-old twins, Kirsty and Gavin Watt, and an 8-year-old son, Angus Smith. Watt's husband, J.C. Smith, fully shares in the domestic responsibilities but with the complication that he commutes five days a week from London to Cambridge where he is Chairman of the Wellcome Trust/Cancer Research-UK Institute of Developmental Biology. And yet Fiona Watt remains delighted with the many pieces of her life.

"We're obviously spending a fortune on childcare," says Watt. "My hours are quite tied at both ends of the day as I need to be home to do homework with Angus. I wish I had more time to hang out in the lab to chat or to enjoy conferences and meetings without feeling that the kids are suffering or the lab is suffering or that my being away is putting additional tension on Jim. But I don't feel torn. If I had had the twins when I was younger, this would have been much harder but I know what I'm doing now."

This phase of Watt's scientific life centers on her central London lab at CR-UK (which was the Imperial Cancer Research Fund until its "rebranding" last year) where she probes the role of integrins in regulating keratinocyte growth and differentiation. "We've moved away from just looking at human (epithelial) cell in culture to try to marry what we discovered there with experiments where we can manipulate gene expression in transgenic mice," says Watt. "We could use the [human] cell culture system to ask what controls the decision to be a stem cell or not. But if we wanted to know how a stem cell decides to become hair or epidermis or a sebaceous gland, we decided we had to go into mice."

Watt traces her personal decision to become a cell biologist to family "caravan holidays" in the west of her native Scotland. For her father, a professor of Dentistry at Edinburgh University, the holidays were a precious opportunity to practice the fine art of fly-casting. For Fiona, it was the chance to explore. "I remember looking into a little pool and I was quite sure I'd seen a crocodile. I rushed to my parents and they said, 'No, no, no, there are no crocodiles in Scotland.' So then I was determined to catch this thing and I did. It turned out to be a newt. After that, I was always keen on frogs, newts and toads."

She determined on biology as her career choice, in spite of resistance at her all-girls Edinburgh private school. Her teachers considered biology for "dummies," says Watt, suitable only for girls who wanted to become nurses. Girls who were "clever" in science were steered into chemistry and physics. Watt compounded her wrongheadedness by declaring her ambition to study biology at Cambridge. Her Scottish headmistress saw this as a profligate waste of examination fees. Fiona would be allowed to sit the exams for a single Cambridge college and that would be an end to it.

It was a stroke of good fortune, says Watt. She landed at New Hall, Cambridge—small, supportive, and all women, including the resident faculty members. This was Watt's first contact with career scientists who were lively, clever and female. Some were even biologists Watt chose Zoology for her degree in 1976 as the closest she could get to cell biology at Cambridge. For graduate research, she went straight to Oxford to work with cell biologist Henry Harris, a pioneer in cell fusion as a tool to isolate tumor suppressor genes. When Watt arrived in the mid-1970s, the structure of cancer cells was still being mapped. "One theory at the time was they lacked a proper cytoskeleton," Watt recalls, "so Henry asked me to test tumor cells to see whether they had microtubules or not." Then came word from the Max Planck Institute in Göttingen that Claus Weber and Mary Osborne had made antibodies to tubulin. "Henry wrote to them asking for their antibodies and they wrote back to say they won't send them but if he sent his student, I could work there. So I did. In two weeks, I got the answer for my thesis. Tumor cells have microtubules."

Göttingen gave Watt more than a quick experimental result. "The Max Planck was so completely different from sleepy Oxford. There were people shouting at each other and people working around the clock and it was all very exciting, not that I wanted to live that way, but at least it showed me there was another way to do science."

With her thesis work essentially done, Watt had two and a half years in the Harris lab to hone her skills with tubulin antibodies. She also became fascinated by the problem of cell differentiation. In 1979, she married her undergraduate classmate Jim Smith, and the couple went off to post-doc fellowships in the Boston area, Smith at Dana-Farber and Watt at MIT in Howard Green's lab. The Green lab was pursuing the cell differentiation problem on two fronts, epidermal and fat cells. Watt was assigned to the epidermal problem where she became close friends with a senior post-doc, Elaine Fuchs. For Watt, Fuchs became the first of what she calls her "senior sisters," American women in cell biology who seemed miles ahead in their careers and their self-confidence. To this sisterhood, Watt adds Mina Bissell, Zena Werb, Helen Blau and Caroline Damsky.

U.S. science was a shock of a different sort for the young British post-doc. "Howard's lab had group meetings," she recalls, "which were completely unknown in Oxford in those days as was the idea of presenting your work in progress." She found the pace frantic, the criticism blunt, and the work exciting.

Outside the lab, Watt and Smith found themselves in a highly unusual position for post-docs they had money. "It was the only time in our lives when we had any money to spare. My husband was on an NIH fellowship that was tax-free and I got these massive tax refunds because I had a husband with no taxable income." They saved some and they splurged some on travel, records, and pinball. Watt kitted herself out to go fly fishing in western Massachusetts with Bruce Spiegelman, another post-doc in the Green lab. "We're still fishing buddies," says Spiegelman, who remains a professional and family friend. Over the years, they've waded streams together in England and New England, occasionally catching (but always releasing) fish, but chiefly discussing science, life and politics. "Fiona is just so enthusiastic and so positive," says Spiegelman. "She always sees the bright side of most situations. Her only problem is that she doesn't hate the people who deserve to be hated."

Returning to London in 1981, Smith began a second post-doc at the ICRF while Watt joined the Kennedy Institute of Rheumatology, a small, freestanding research facility named for the husband of Marks & Spencer heiress Matilda Marks Kennedy. At 25, Watt became a group leader. Looking back, Watt says it was almost preposterous for someone with so little experience to be setting up her own laboratory, yet the Kennedy was the perfect place to start small, friendly, and glad to have its first cell biologist.

Mina Bissell encountered Fiona Watt soon after. "I was at a meeting in southern England when this lovely young woman got up and gave this clear, absolutely no-nonsense talk. I was really wowed," Bissell recalls. Since then, Bissell has closely followed Watt's career in the lab and as the chief editor of JCS closely. "Everyone knows she's done wonders with JCS," says Bissell. "Her science is fantastic and I know because we've been drawn into many of the same issues with extracellular matrix, integrins, and, of course, stem cells."

In 1987, Watt left the Kennedy for her current post at CR-UK. It was a difficult decision but her work was a better fit in a cancer setting, she says. The complex path of epithelial stem cell differentiation is often mirrored in the deregulation process of tumor genesis. Watt takes her cancer affiliation very seriously. In choosing research fellows, she is always on the lookout for a "medic," an MD fresh out of specialized residency with an interest in basic research. "In the UK, we don't have MD-PhD programs. But I like to have a medic in the lab. It's very good for the basic scientists in the lab to rub shoulders with a clinician. It gives them a greater sense of urgency."

Watt began her five-year term as president of the British Society for Cell Biology in 1999. As a longtime member of the ASCB, Watt appreciates the great differences between their missions and operations. The BSCB, for one, is much smaller, has no permanent office, or regular staff. "It's a much more ad hoc organization," Watt explains. "When there's a job that needs to be done, I say to my committee, 'Who's going to volunteer for this?' And everyone looks down at the table. But we've been lucky in that we've always had members who've been active in putting out the newsletter and organizing meetings." A plus side of the BSCB is the intimacy of its scientific meetings, says Watt. "To take students where they can actually see somebody whose work they've read is absolutely in spiring."

Watt is also serious about educating the British public on biomedical research. On stem cells, she speaks regularly to the media, to schoolchildren, and to parliamentary and institutional committees. "In Britain, I think the public is poorly educated in science," says Watt. "They are also suspicious of science in a way that Americans are not. Partly, it's a social class thing. There's this stereotype going back a century of the bright working class man who becomes a scientist or an engineer. Partly, it's because that until recently, our educational system has been very narrow. Either you do Arts or you do Science. The people who do Arts tend to dominate public life and the government. The people who do Science don't."