

Taking an Unconventional Route?

Janet R. Morrow



The path to my current position as professor of chemistry at a large public university could be considered to be a conventional one. I became interested in biological and chemical research as an undergraduate college student. I pursued that interest in graduate school and received my Ph.D. in chemistry. I was a postdoctoral fellow in two laboratories prior to landing my current job. Along the way I got married and had two children. When I embarked on my career 24 years ago, it was less common for women to major in chemistry and very few moved into an academic position. This was especially true for women with children. When I look at my current working life and my path to it, I feel very fortunate to have landed in such a challenging and interesting job. There is nothing more rewarding than having a family and there is nothing more enthralling than doing research.

Remarkably though, being a female faculty member in chemistry at a research institution in the year 2014 is still not very common. I have seen many talented women decide not to pursue an academic position even though I thought that they might have been happy and successful in taking this route. I write this brief account with the hope that it will guide junior scientists in their efforts to balance work and family. I hope my story will encourage women to pursue a career in academics if that is their desire.

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Beginnings

I had a wonderful childhood in southern California. My father was an electrical engineer who worked in industry. My mother was a nurse, although after the birth of four kids in four years, she practiced nursing only upon request by friends. She still has an encyclopedic knowledge of medicine and physiology and obviously takes much enjoyment in it. My father was a traditional working father, but he encouraged both me and my three brothers to study science or engineering. Over dinner and on vacations, my dad would question us about how we thought the physical world worked. He would ask us how we thought electrons might travel in different media and discuss what he knew about atoms and molecules.

My three brothers and I body-surfed, skied, climbed, and hiked our way through childhood. We spent hours in the backyard swimming pool playing Marco-Polo and also playing soccer. My family traveled throughout the western USA for vacation, camping and backpacking along the way. My father noticed my interest in ocean life and encouraged me to study marine biology, a trendy topic at the time because it was forecast that humanity would need to cultivate the oceans for food.

College

I went to the University of California, Santa Barbara (UCSB), to study marine biology. The only university I considered attending was the University of California. The UC campuses are renowned for science, and the tuition was a bargain at that time. My parents had to plan for having four children in college at nearly the same time and this was clearly a factor in the decision. It turned out to be a good choice for me because I was able to take a range of courses to try out different science and engineering disciplines as well as to start undergraduate research projects early on in my studies.

The introductory science courses at UCSB were large and I wanted a more individualized experience. On the recommendation of a friend, I started research in the laboratory of Professor Barbara Prezelin in the biology department during my sophomore year at UCSB. I loved the research and I enjoyed being part of a larger team of people with a focus on research. I spent a summer and a couple of academic years culturing dinoflagellates and attempting to isolate a type of chromoprotein that was involved in light gathering for photosynthesis. On one memorable field trip, we rented a boat from the Scripps Institute of Oceanography and collected samples of dinoflagellates along the coast of Santa Barbara. But my protein isolations and purifications were difficult, and I was frustrated by my lack of background on how to improve separations. I enjoyed thinking about science in terms of molecules and liked the way that chemists could propose solutions to my questions on protein purification and chromatography. I transferred to the chemistry department in my junior year and started two new undergraduate research projects, one in

ultrahigh vacuum studies of platinum surfaces with Professor Arthur Hubbard. Then I moved on to Professor Peter Ford's group to study the photochemistry of platinum organometallic complexes. After I graduated with my B.S. in chemistry and was waiting to attend graduate school in the fall, I worked on the preparation and characterization of micelles under the direction of Professor Henry Offen.

The experience of working in four different research laboratories in different areas of chemistry/biochemistry influenced my approach to science in later years. Chemical research is becoming increasingly interdisciplinary and this early experience encouraged me to dive into new collaborative research projects later in my career. I planned to go to graduate school because I so enjoyed these research experiences. I toyed with working for a year at a job in the food industry, but in the end decided to go right to graduate school on recommendation of my advisors. Spending a year in industry might have been beneficial, but clearly given the relatively long period required for graduate school, it was best to get through with little delay given that I was sure I wanted to pursue a graduate degree. At that point, I had a steady boyfriend but was not ready to settle down. I was eager to enjoy my time in graduate school.

Graduate School and Postdoctoral Studies

I chose to attend graduate school at the University of North Carolina, Chapel Hill, based on the strength of the department in analytical and inorganic chemistry. At the time of sending out applications, I couldn't decide which of these topics to pursue. Once I got there, I decided to study organometallic chemistry in the research group of Professor Joe Templeton. I liked the combination of synthesizing molecules, coupled with spectroscopic and structural characterization of the molecules and molecular orbital theory. The big change in scenery and culture from southern California was a maturing influence. For fun, I learned to whitewater kayak and to rock climb. Chapel Hill was rich in music, especially Blue Grass and Irish music. I remember that time fondly. Research went well and the bulk of my work was published prior to graduation. This was a tribute to my graduate advisor who submitted manuscripts in a timely way. I wasn't savvy enough at the time to appreciate it, but graduate student publication rate and quality is one very important metric to look for in a Ph.D. advisor.

Before I knew it, it was time to move on. I started searching for a postdoctoral position to continue my love of research, travel, and the outdoors. I chose to apply for international postdoctoral experiences and was awarded a fellowship from the National Science Foundation to study at the University of Bordeaux for 15 months with Professor Didier Astruc, an organometallic iron chemist. I defended my thesis and got married in the same week. A few weeks later, we left for France to start my postdoctoral position. Prior to that we would honeymoon in the French Pyrénées and climb with members of the French Alpine Club.

Working in a French laboratory took some adaption on my part. I had to change my research plan according to the available resources which were, at the time, different than in laboratories in the USA. For example, the NMR spectrometers were limited to hands on for staff only, but there was an EPR spectrometer and instrumentation for electrochemical analysis of iron complexes that I could use freely. I also struggled to adapt to a different culture and language. All in all, it was wonderful adventure. My husband and I traveled widely throughout continental Europe during the long summer, Christmas, and spring breaks. During one climbing escapade in the Wilder Kaiser mountain range that took place after I had attended a conference on organometallic chemistry in Vienna, I fell 150 feet down a cliff face and broke several ribs and punctured my lung. I was rescued by helicopter and spent a couple of weeks in the hospital followed by a painful train trip back to Bordeaux. That took a few weeks' time out of my research projects, and convinced me to move on to tamer sports.

This period in Europe was full of formative experiences that would build my confidence and courage to tackle challenging projects and to work with people from different backgrounds and nationalities. One of the most challenging was a presentation at the end of my stay that I gave to a committee made up of French and German scientists. This was more stressful for me than my Ph.D. thesis defense because it had to be given in French.

After 15 months of adventure and hard work, I was ready to return to the USA. I wrote to several faculty members and had three positions to choose from. I chose to work with Professor Bill Troger at the University of California, San Diego (UCSD), based on research interests, and his reputation as a good mentor. I also considered the university setting. UCSD is a large university that I thought would have good professional development and job placement opportunities. Bill was a wonderful mentor and allowed me to sit in on courses and to initiate a new project in the area of bioinorganic chemistry. After 11 short months, I was on the job market. I did apply for a couple of industrial jobs, but then put most of my efforts into searching for academic positions. I wanted a position in a large university with an emphasis on research, similar to what I had experienced.



Janet in her climbing days at Chapel Hill

Life as a Faculty Member

I accepted a position at the University at Buffalo, State University of New York (UB). UB is a large public university with a comprehensive set of colleges/schools including a college of engineering and a medical school. I moved there with my husband who soon started his own small business in violin making, sales, and repair. One of things I did not appreciate at the time was that western New York was also an excellent choice for raising a family. The commuting time was short, the public schools were excellent, and the family-friendly atmosphere made it relatively easy to bring up a child.

Nothing quite prepared me for the challenge of my first faculty position. It always is a busy lifestyle, but the learning curve at the start is steep. I juggled teaching new courses, leading students in research, being in the lab myself, writing manuscripts and proposals, and giving presentations as a faculty member. I made the error of starting too many projects and spreading myself too thin. I naively expected that my students would be as motivated as I was. Management skills were not something I learned very much about in graduate school and had to develop as I went along.

The birth of my first child, Erin, at the start of my second year as a faculty member forced me to narrow my choices of research projects. I chose the most promising ones and focused on them more effectively than I had before her birth. At the time, there was no maternity leave policy and I took off 2 weeks from teaching

after she was born. As the only young female faculty member in the department, I received some negative comments on the pregnancy. One of my colleagues told me flat out that “some things are more important than tenure.” A graduate student asked me: “Are you going to quit?” Other faculty members were more supportive and even offered to babysit when I had meetings. I was given the semester off the following spring. This turned out to be of key importance for my research. I could spend more time in the lab and I traveled to conferences as well. This time for travel enabled me to develop key collaborations, one in academics with Professor Bill Horrocks of the Pennsylvania State University and one in the biotechnology industry with Dr. Brenda Baker of Isis Pharmaceuticals. These collaborations enhanced the scope of my research and garnered the attention that was needed for a successful tenure case.

Post-tenure

Our son Garrett was born a year after I got tenure. This time, I took off 6 weeks from teaching. Like his sister, he an easygoing and happy child and this made it feasible to travel with him and to bring him to work as needed. However with two small children at home, I traveled less during this period. Despite the reduced stress from having attained tenure, I remember this period as being especially tough to balance work and home life.

Of course one of the ways to influence departmental atmosphere is through administration. I was associate chair for six years. In this position, I participated in the administration of the department and interacted with university colleagues in other departments. During this period, I observed that the attitude toward junior faculty had improved. We made the effort to hire more women and now have five female faculty members out of 30 total. I have resisted taking on more administrative duties, because research is still one of the most rewarding activities for me. Interdisciplinary and collaborative research requires a large time commitment in order to stay abreast of new fields and evolving research projects. Currently my research has a heavy component in magnetic resonance imaging contrast agents that contain iron and cobalt and in the design of metal ion complexes that interact with unusual nucleic acid structures.

Reflections

If there is anything I would emphasize, it is to be determined and committed to your science, but be flexible and keep a sense of humor about getting through your day. Maintaining a balance between family and career is challenging. In my situation, neither set of grandparents lived close by, nor could we afford a nanny. So I combined mundane activities such as grocery shopping with treats when the kids

were small. We would get helium-filled balloons and cookies at the store while we shopped at Wegmans. I would make up exams for them to work on while I was grading mine. I took them on business trips and combined these trips with vacation activities when I could. Erin, my pre-tenure child, traveled with me to conferences, university lectures, study sections, and international trips right through her teens. We joke that this travel and continually new and changing experiences contributed to her restlessness as an adult. At 24 years of age and just graduated with a master's degree in electrical engineering from Columbia University, she has already traveled to more countries than I have.

Both of my children did experiments with me in the laboratory on weekends. We put together chemistry demonstrations for their classes. During one of them, an unexpectedly large chunk of flaming sodium metal shot up right into the middle school classroom ceiling. The ceiling was fortunately fireproof. The neighborhood kids remembered me for that one. Several years later, my daughter published a research paper with me while she was an undergraduate engineering student. She came to appreciate my career from a different perspective when she entered college herself.

Did my career influence my family time? Of course, but this is likely the case for any career woman. I generally work on the weekends, especially to catch up on reading. During certain periods of her life, my daughter was vocal about my lifestyle and commented that I was not a girly-girl. When I asked her to explain, she said that I wasn't an avid shopper, and didn't fixate on decorating the house. I didn't rush out to the furniture stores to get the best deals. I didn't fuss over my kid's clothes and appearance as her friends' moms did. In my defense, I remember doing many girly things such as taking long shopping trips in search of the perfect dress for middle school and for high school dances. In any case, your life will inevitably be different than most people's lives because you are a scientist. Your kids will let you know that.

Finally, it is of utmost importance to find a good balance between work, family, and other interests. There have been times in my life when things seemed especially challenging and it was important that I could fall back on friends and family or an activity outside of science for a brief respite. As your children grow, you will develop new interests and activities to share with them. I feel very lucky to have balanced raising children with an academic career. I hope that my route becomes a conventional one for women.



Janet and her family on vacation in the Cayman Islands

Main Steps in Janet's Career

Education and Professional Career

1980	B.S. Chemistry, University of California – Santa Barbara, CA
1985	Ph.D. Inorganic Chemistry, University of North Carolina at Chapel Hill, NC
1985–1986	Postdoctoral Fellow, University of Bordeaux, France
1986–1988	Postdoctoral Fellow, University of California – San Diego, CA
1988–1994	Assistant Professor, University at Buffalo, NY
1994–2003	Associate Professor, University at Buffalo, NY
1996–1997	Visiting Professor, University of Rochester, NY
2003–Present	Professor, University at Buffalo, NY

Honors & Awards (Selected)

- 1985–1986 National Science Foundation Postdoctoral Fellowship
- 1994–1996 Alfred P. Sloan Fellow
- 2007–2009 National Science Foundation Special Award for Creativity

Janet is the Director of a National Science Foundation Research Experience for Undergraduates site at the University at Buffalo.