The American Association of Immunologists
Oral History Project

Transcription

Pamela J. Fink, Ph.D.
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Williams: This is an interview with Dr. Pamela J. Fink for the American Association of Immunologists Oral History Project. Dr. Fink is professor emeritus [Ed. emerita] in the Department of Immunology at the University of Washington. She served as Editor-in-Chief of *The Journal of Immunology* [(*The JI*)] from 2013 to 2018. Dr. Fink is a Distinguished Fellow of AAI and was the recipient of the AAI Lifetime Achievement Award in 2019. We are at IMMUNOLOGY2019™ in San Diego, California. Today is Sunday, May 12th, 2019, and I am Brien Williams.

Pamela, thank you very much for doing this.

Fink: Pleasure.

Williams: Let's start with you giving me background about you, your family, [and] your education.

Fink: I was born in Dodge City, Kansas, and, yes, there is that place. [laughs] That's the first surprise most people have. So, right in the middle of the country. My dad was a general practitioner, so he mostly went around to various farmsteads and delivered babies and sewed up and casted broken limbs. We moved when I was really fairly young and I spent my whole childhood in Kansas City, and I think we still had a sort of farming strain in the family. Both my parents grew up in a farming community, so I think that's pretty much embedded in my background, even though I grew up in a city.

I was the third of three girls, and despite the fact that my family was probably fairly socially conservative, all three of the girls went on to have important careers. One sister is a foreign-language editor and a musician, the other one is a contract lawyer and a member of the Alaska National Guard, and then me as a scientist. So somehow we got it through our heads that it was important and, I guess, not just possible but expected that we would go on and follow our interest.

I didn't have a direct path into science. I, as a kid, wanted to be an astronaut, like every child in that era, because of the whole man-on-the-moon thing, desperate to be an astronaut until it turned out that you couldn't get as motion sick as I get. I can get motion sick watching a bad video. So that career was eliminated, as was marine biology, which was the second thing I wanted to do. And the third thing that I wanted to do I stuck with for quite a while, which was to be a classical dancer, ballet dancer, and I was part of the Kansas City Civic Ballet for a number of years, kind of restricted my college applications to schools where there was both science and dance, and ended up at Indiana University [(IU)]. But great plans sort of die in the dust, because I discovered that five-hour labs and five-hour ballet rehearsals really were not compatible, and so given my relative lack of talent in ballet, I stuck with science. And that's how I ended up following my nose into science, a lot of sort of false starts, I guess.

Williams: So talk about IU as an environment and a place to grow and enrich yourself and so forth.

Fink: Well, it was a huge state university. I had been to a very large high school in Kansas City, but that large a state university would have made me a bit lost, but they have this wonderful program of a science core where the same students track with each other, same twenty-five or so students track with each other, through all four years, so within a big university, I could be part of about a class of twenty-five. We studied everything from ecology to genetics and molecular biology, such as it was then, and I feel that that background just gave me the power to decide what within science I was most interested in.

And it was just a wonderful community, very broad. So the music there was spectacular. The dance is very good. Sports were a thing, you know, big basketball school and swimming school. So I kind of could sample everything without any preconception of what it would be that I would end up doing, and I found that to be a huge advantage. I could take advantage of everything that was there and pick and choose what I liked.

Williams: So the time that you got your B.S. and left Iowa—

Fink: Indiana.

Williams: Sorry.

Fink: They're close.

Williams: What was your sense of your path ahead?

Fink: Well, I thought I wanted to study developmental biology. I loved, really, the elegance of that. It's a very three-dimensional process, so the sort of gestalt of it was just very beautiful, had a great aesthetic, and even then, it was clear that there was going to be a lot of things discovered as soon as we had the tools, the genetic and molecular biological tools, to study these amazing questions. It was easy to pose questions in developmental biology in the seventies and very difficult to answer them, and that really appealed to me. It just felt like, ooh, you're sort of on the cusp of really being able to make inroads into an important question.

But when I went to graduate school at MIT [Massachusetts Institute of Technology], I thought I would be interested in developmental biology, but I got fascinated by immunology as a very developmental system, because in immunology, the development of the lymphocytes occurs not just during embryogenesis in one very discrete period of time in an organism's life, but throughout life, because throughout our lives, we have undifferentiated stem cells that enter, in the case of the T cell, a discrete organ, the thymus, and within that

organ, they sort of learn how to become T cells and stuff happens, and two weeks later, they pop out as functional but self-tolerant T cells that then can roam around the body and protect against invading pathogens. So that went on throughout life, so I wasn't stuck with just looking at frog embryos; I could look at higher organisms throughout their life and try and understand the processes of lymphocyte development. So I did end up in developmental biology, but through immunological systems.

Williams: And who were your mentors at MIT, and what was that like being there?

Fink: I did my graduate work in the lab of Michael Bevan, whom I am now married to, so that's an interesting side story. But I was fascinated by the questions he was posing, which were how could T cells learn to recognize foreign antigens and be selected to be able to recognize foreign antigens, but in the total absence of those foreign antigens? How do you select a cell to see something that it's not allowed to be seeing at that time? Which is a complete conundrum. It was just one of those head-scratchers.

There were many theories floating around about how that could happen, and Mike had the set of tools and genetic manipulation of animals, in this case, mice, to be able to make inroads into answering that question. I just found that so little was known and so much needed to be discovered that it was just a very wide-open and very exciting field, and that was within MIT, which at that point, and probably still is, very mechanistic. They drill down to the total detail of everything. So it was these wide-open questions within a university that focused on the details. So we were the odd ducks, really, in that Department of Biology there, and that appealed as well.

Williams: Let me just backtrack for a second. Describe, define the term "developmental" in this context.

Fink: Well, in the context of a lymphocyte, there are undifferentiated stem cells that could, in certain circumstances, become almost any of the cells of the immune system, from B cells that make antibody to T cells that use cell surface receptors to kill, for example, virally infected cells, those cells that learn to display antigens and trigger immune responses. They can even become cells, say, erythrocytes. They're all blood-borne cells, and the same stem cell can be triggered along these different pathways depending on the environment in which it settles. So it's a matter of whittling down all the possibilities to the proper one within the context of where the cell sits. So in the case of lymphocytes, this involves DNA rearrangement, permanent things that happen, to generate receptors that see the whole universe of antigens, and these are just remarkable processes, from DNA rearrangement to proliferation to really striking selective events that kill 99 percent of cells and save only the 1 percent that are doing what they should do. So these are just real key processes in biology, in general.

Williams: So when did you and your mentor "hook up" significantly? Was that at MIT or later?

Fink: It was toward the later years at MIT. Then I went off to postdoc clear across the country, in Irv [Irving L.] Weissman's lab at Stanford, and we just couldn't sort of get rid of each other. [laughs] It was very hard to maintain a relationship across the entire nation and we did so for nearly two years, and then he moved from MIT to the Scripps [Research] Institute and I moved from Stanford back down to the San Diego area, where we are now [at IMMUNOLOGY2021™], and our relationship was strong enough that it lasted through all of that distance and those moves.

Williams: So you were at UCSD [University of California, San Diego], I guess, is that right?

Fink: I was at UCSD, in Steve [Stephen M.] Hedrick's lab, working on molecular biology of the T cell receptor in the early days when, excitingly, the receptor genes were first cloned. I was lucky enough to be able to be a part of that after the cloning and looking at sort of the characterization of T cell receptors.

Williams: And Michael was—

Fink: He was at Scripps, just a mile or so away, at work.

Williams: And doing the same line of inquiry?

Fink: So that was part of the issue. When you're a couple in the same field, how do you handle that? In our case, it was even more, I don't know, problematic in that I was junior. He was famous, eight years older than I am, and I was really concerned, as was he, at distinguishing myself from his work, which is why I went into molecular biology, although it wasn't really my love. My love was always developmental biology and developmental immunology, but I thought that was something that he wasn't going to do. The opportunity presented itself. Steve Hedrick was a great mentor and had, fortuitously, a fantastic lab, and I was his first postdoc, so I could learn also how you set up a lab and enter a totally different field. So I worked very hard at distinguishing myself from my graduate work, which was the work of Mike Bevan.

Williams: Describe what your experience was like at Stanford [University].

Fink: At Stanford, I was in Irv Weissman's lab, very big lab. He was a very hands-off mentor, incredible creative force. I mean, he had just wonderful ideas. But I was used to a small lab and probably used to a bigger city, and being apart from Mike was hard, so it was a bit of a personal struggle for me, but professionally, I learned a lot in Irv's lab. And I continued that work, actually, after I moved down to UCSD. I did a lot of experiments. I would fly up to the Bay Area, do an experiment, a twelve-hour experiment, and fly home with the cells in hand, which

you couldn't do now, but I could do this without having them be irradiated and then complete the experiments down here. So I had these, like, I don't know, sixteen-hour work days or something while I was doing that, but it was good. It made me feel more responsible for leaving Irv's lab earlier than I had originally intended to, and it allowed me to complete some things that I was super interested in, so that was sort of a transition period for me while I moved to San Diego.

Williams: And how did you settle into life in the San Diego, La Jolla realm?

Fink: That was super easy. Mike and I had a house together. We had pets. We had two separate careers. He was running a lab, [and] I was a postdoc, which is a fairly carefree phase of life where you're just focusing on yourself, so it was good. We were at different stages doing different things, but could certainly talk to each other and certainly understand any problems, work problems that we wanted to talk through, so it was really great. It wasn't direct collaboration, as such, but I think we could very much support each other, and it was helpful for both of us.

Williams: So you were in this environment for a number of years?

Fink: I was a postdoc for a number of years, then I became an assistant member at Scripps for a few years, and by then, we had children. So both our kids were born here [in San Diego], both boys, and they were two and four when we left San Diego to move up to Seattle. We did that partly because I never felt entirely at home in San Diego, and from our first visit in Seattle, it just felt more like home. We both like to hike and do things outdoors, and it was a vibrant, interesting city with lots of dance, which I was still focusing on, not personally but as a spectator, lots of music, obviously, good food, and just a huge hiking environment, so we both fell in love with Seattle and moved there in 1990.

Williams: After a lot of deliberation or not?

Fink: You know, not so much. So it was tricky, right? We were looking for two positions, one senior and one junior, a place where I felt I was being treated independent of Mike, where people didn't do the, "Hi, Pam. How's Mike?" routine [laughs], but actually knew my work and wanted me to be a part of a work environment, and a place that we liked, we wanted to live. So we actually looked at Philadelphia, London, and Seattle, and ended up at Seattle. So, yeah, it was one of those decisions that could have been really, really difficult and was not.

Williams: And did you have to negotiate quite a bit with the University of Washington for a dual appointment?

Fink: No, we didn't. It was a department that had just split from microbiology. So it's very common for microbiology and immunology departments to be together, and in this case, they split right in 1990, so we were the first external recruits to the department. So there was space for two of us. We had our separate research

interests. And they were really happy to have a senior person join with a lot of clout, but then wanted to build the department with junior people like me, so it actually worked out really well.

Williams: Was there a backstory to the separation of microbiology from immunology?

Fink: No, not especially. It became clear that immunology was going to be highly diversifying anyway, because you had everything from developmental biology that I was interested in, real molecular-type things, real genetic things, and then lots of translational work, and microbiologists were mostly interested in the pathogen end of things, whereas we were becoming interested in autoimmunity, for which there is no pathogen except for the self cells themselves. Yeah, it was separated for that reason under the aegis of Roger Perlmutter, who's a prior president of the AAI, who's a very sort of motivating, strong force and ended up establishing that department.

Williams: So he was the one that established it?

Fink: Mm-hmm.

Williams: And what did your husband come in as?

Fink: He did not want to have any administrative duties. He's a purebred scientist, yeah, so he wanted his own lab and not to be messed with. He came in as part of the Howard Hughes Medical Institute, which meant he was not an employee of the state of Washington per se, which I was, or am, and, yeah, he came in just with his own research group.

Williams: So talk about the development over time of this new department.

Fink: Well, it was fun. When we came, we could be part of the recruiting process to build the department, and we got an excellent group of people that we could bring in over the years. Our voices were certainly listened to. We weren't a small part of a huge group; we were kind of *the* group and we could help grow it in the way that made sense to us. So that was another advantage, but with none of the burdens of being the chair of a department. We could still be an important part of a recruiting process and building up of a department, and I think we did that successfully, and it was really very gratifying to see that over the years.

Williams: So describe the department at the time of your becoming an emeritus member of it. How had it grown, and how large was it, and so forth?

Fink: Yeah. Oh, I should have looked this up, because I don't know offhand the number of primary faculty, on the order of ten-ish, but, importantly, a lot of affiliate faculty. Seattle itself has grown a lot in the biomedical industry. We have affiliate faculty from Virginia Mason Benaroya Research Institute that are an integral part

of the department, as well as Seattle Children's. I'm going to get in trouble for forgetting things, but lots and lots of different organizations, research groups within the Seattle area, and it's just wonderful to have all of that collaboration from people with different interests but that turn out to overlap after time.

Williams: And that kind of cooperative esprit developed over the time that you were there?

Fink: Yes, yes. I think in immunology in general, because it was a small, focused field that then turned out to have import across the boards. So I think if you look at Minnesota, for example, they feel the same thing. They had a small focus group that now interacts a lot with epidemiology, pathology, genome sciences, for example. All of these things that were really not a big part of immunology at one point certainly are now.

Williams: We just got through taking to Kristin Hogquist.

Fink: Oh, yeah, one of my favorite people.

Williams: And I can understand why. She was talking about a two-immunologist relationship and so forth, not unlike yours, and the fact that they had to seek out a place that would take both of them.

Fink: And you might not know this, but Kris Hogquist and Steve Jameson, her husband, were both members of Mike Bevan's lab, so I know them very well and knew them before they knew each other. So, yeah, there is a long lineage here. I know, it's remarkable.

Williams: Right. So what would you like the public to know about the contributions you've made to basic science?

Fink: That's a hard one. I think for my graduate work, I'm really most proud of experiments in which I was able to mix and match that thymic environment that I talked about, which is the home for stem cells to learn to be T cells and the genetics of the animal at large and the T cells themselves. So I could make a T cell of one type, of one genotype, grow up in a thymus of a different genotype and ask how that impacted what kind of T cell that ended up to be.

The reason this turned out to be important is it became clear that T cells learn what they're going to define as self environmentally, not genetically, so you can make a T cell of one type think it's a T cell of a second type, and it learns how to define what's self and what's not self by the environment in which it differentiates. This is important because that self/non-self discrimination is absolutely critical for any cell that you're going to arm with the ability to kill another cell. You better know who your enemies are and who your friends are, and that is how that T cell learns how to do that, is within the thymus.

Those experiments were hard because they involve removing the thymus from an animal and inserting a different type of thymus under the kidney capsule, for example. So it was hard-ish surgery, and I was a first-year graduate student. It turned out I had good hands, and it just felt like, oh, this is something that I can actually do and answer a question. So I think that was one I'm most proud of from graduate work.

I think from postdoc'ing, it's definitely the T cell receptor structure function, repertoire analysis I was able to do by being a bonafide immunologist with the molecular biological tools to follow something in that sort of detail, and this was all made possible by a whole series of T cells from different backgrounds that could all see a similar antigen, so we could begin to ask, well, what is it about the way it sees that antigen, what antigen-recognition process does it use, and what parts of that engaging receptor focus on antigen. The antigen that T cells see is quite complicated and involves foreign and self-peptides embedded, actually, in a very large, complicated, and beautiful antigen presentation structure on the cell surface that's a molecule that's the most diverse molecule expressed by mammals, for example. So my antigen presentation molecules will be unrelated to yours, for example, and yet the T cell has to learn to focus on those with something foreign embedded in them. And it's a very complicated thing in three dimensions. It's still a source of many of the talks here.

Williams: Many of the what?

Fink: Many of the talks here are still focused on exactly how that happens. So that was a completely different viewpoint of the same process, and I found it difficult at first because it's just not how I think, but I think I did make an impact in that, and I was proud of that. Even though I never continued with the sort of molecular analyses, I think I was able to understand their strengths and weaknesses and the kinds of questions that they can legitimately ask with those techniques.

Williams: Was all of your research with animals? Mice, I suppose.

Fink: Yeah, pretty much all with mice, yep. Yeah, they're the standard model system for these developmental types of studies, because starting way back with George Snell, there are these homozygous identical mice that are very predictable and can be bred as such and differ from very similar but slightly different strains of mice that you can use to compare and contrast, and so the genetics were all there. The genetic tools were all there, and so it made it possible to really make inroads. And their immune systems are similar enough to those of humans that the tools were there and you could ask the same questions of those animal models that you could with humans, in many cases.

Williams: And is there a way of drawing from your research to translational results or not?

Fink: Yeah, absolutely. I mean, the hope is clearly that that's the case, certainly molecularly the way a mouse T cell receptor, that receptor that looks at the foreign antigen, is very similar to humans. What they recognize in detail is different because human antigen-presenting molecules are different from those in mice, but that whole process is certainly translatable from mice to humans.

What I've worked on most recently are the very youngest T cells in the body, those that have just left that generative organ, the thymus, and it turns out they're not fully mature. We thought they were, but in looking in more detail, we discovered that they're not actually the same as cells that have been out and about away from the thymus for a while. And this is true in humans as well, and the reason that's important is because those particular cells—we call them recent thymic emigrants, those cells that have recently left the thymus—constitute 100 percent of the cells in a neonatal individual, those very individuals that we're busy vaccinating against future organisms that they may encounter in the future. They don't respond in the same way that mature T cells do, and so understanding that turns out to be super important for neonatal immunology, for looking at how individuals recover from lymphoablative therapy, like for cancer treatment, because this first wave of T cells that recover after that kind of treatment that kills all mature cells are those cells that I've been studying, these recent thymic emigrants. So in that case, it's quite translatable as well.

Williams: So that process is going on throughout one's life?

Fink: Mm-hmm, absolutely, yeah. Yeah, the thymus shrinks in older individuals, but these recent thymic immigrants are still apparent, even in older individuals, yep.

Williams: But I thought I heard you say that a huge percentage of the cells in a natal situation are these T cells. Is that correct?

Fink: Yeah, these young T cells, yeah, because they start with nothing, no lymphocytes at all, and so that first wave are all cells that have just left the thymus. Then they mature and have a longish half-life. They live for quite a while, so new cells are coming in, but the old cells are still there.

Williams: What stage in gestation does the thymus become active?

Fink: Well, in mice, it's between like day eleven and twelve, something like that, it gets seeded with cells and begins differentiation, and that's embryonic day eleven out of a twenty-, twenty-one-day gestation. In humans, it's a bit later, and human immune system is more well-formed at birth than the mouse is, which is a little bit surprising.

Williams: So have we pretty well covered the scientific aspect of your career?

Fink: Yeah, I feel that way, yes.

Williams: Good. So you joined the AAI in 1987, I believe.

Fink: Yeah, I think that's right.

Williams: What prompted you to do that?

Fink: I don't think I was aware at that point of how much AAI does for the immunological community, but I wanted to start coming to these meetings, and I was publishing in *The Journal of Immunology*, which is the flagship journal of the Association, so it made sense to join.

Williams: And you began to do quite a bit of committee work.

Fink: I did, yeah, yeah.

Williams: And the first committee I guess you worked on was the one on the status of women [Ed. Committee on the Status of Women].

Fink: Yeah, I think that's true. Yeah, that is true.

Williams: In '96 through '99.

Fink: Mm-hmm.

Williams: So what was the status of women like at that point?

Fink: Well, there were fewer women, lower representation, I would say, definitely not a lot of effort to include women in the programs. There was no discussion of sort of a gender balance per se until the women made it clear that we had to work on this, and just because you had male friends, that you should try and sort of expand your boundaries. I think it was a very receptive audience. I always felt that the suggestions that I and other women made were actually listened to.

Williams: Were there pockets at the time of male resistance around the country?

Fink: Certainly, yeah. I mean, I went to grad school at MIT, which is a very male-dominated institution, but even at Indiana University, I could feel that, the surprise when a young woman would ask a question in a seminar, and, you know, a little disrespect. I remember times in classes when I would say something and get a kind of, "Yeah, okay," and then a male colleague would say the same thing and it was suddenly this great leap forward. But I have to say that after that, the male colleague would turn to me and say, "Isn't that what you just said too?" And I would go, "Yeah, it kind of was."

So part of it is in delivery. I think women have now learned to present themselves in a more forceful way, which also makes us heard better, and I think men have become much better at listening to that and understanding there are many different ways to say the same thing and they all need to be listened to. So it's been an interesting evolution.

Williams: You've talked about your cadre of colleagues at IU. How many of you were women?

Fink: I have always had female friends doing the same thing I was doing, so I'd say—I'm going to throw this out there—probably a third women. That's about what it felt like. I have members of my graduate class, my MIT graduate class, that we're still in very close contact with, and, in particular, the women. We've all actually been successful. We've all developed careers in science and all have amusing stories, but those that our male colleagues also know about and are cognizant of.

Williams: So the committee work that you did when you were on the Committee on the Status of Women, was it mainly advocacy or were you studying the role of women and so forth?

Fink: There were some data gathering to know how many female members at various stages and how many times they were part of the plenary programs at major symposia, how many times they were asked to organize. Then we put together a list of women in all the topics of immunology so that if you were head of a major symposium and you wanted to find someone who worked on a certain disease, you could look and see if there were women that you were perhaps overlooking or not aware of who did study that basic topic. So it was mainly kind of gathering data and providing lists to people, I would say, is what we did in that era.

Williams: Another committee that you served on was the Abstract [Programming] Committee, and I think people that don't know the science community are going to say, "Well, what's that about?"

Fink: [laughs] Well, when people want to present their work at a meeting, they submit an abstract, which is basically a paragraph providing the overview of what your work shows. Usually, you have to provide this many months before the meeting, so that keeps you from providing all the detail because you don't actually know where you're going to be, your work is going to be, at the time the meeting is held. So mainly it's something that says, "*x*, *y*, and *z* are known. We're interested in this. There are these new approaches. We're applying these approaches to ask this question. So far, we have found that in spite of our preconceptions, this is not the case, and are now looking into the mechanism of what happens." That's kind of an abstract. They get presented or uploaded, and then it's the job of an abstract programmer to go and see what things look really interesting at the point that they're at a stage of completion that it would be really good to present, and if so,

trying to organize them into sessions that have a common theme. That's all it is. [laughs]

Williams: So you probably work, then, pretty closely with the Programming [Ed. Program] Committee.

Fink: Yes, absolutely.

Williams: Which you were also—yes, you were—you were on that.

Fink: I was part of that, yes.

Williams: Yes, yes. And the Nominating Committee and then finally the Publications Committee.

Fink: Yeah.

Williams: You were very devoted to the committee work of the AAI.

Fink: Yeah, because the committees were always super well organized. I'm a very organized person, and the easiest way to lose me is to drone on about what we're going to do and then not do anything. I'm like gone. So what I loved about the AAI committees is that you sat around and talked about what you were going to do and then you did it. [laughs] It was like, "Oh, this is my kind of committee." So I kept coming back because I felt I was relevant, but our work was useful and was actually going to get done, and the next meeting we were going to discuss the impact of what we did prior, not rehash what we were going to do and then continue to not do it. So they're very well-run committees, in general.

Williams: Was that approach to matters from the top or is it just in the nature of the people that are AAI members or—

Fink: Kind of both. Michele Hogan is a remarkable executive director. Everyone will tell you this. She's a taskmaster, but also listens, so it's like the best of both worlds. So you don't mess around with her, but she wants to hear your suggestions and is very good at facilitating things that you want to get done. And also I think scientists, just in general, tend to be fairly organized and want results for the time they spent. So I think, yeah, I think it's partly some of each. As scientists, we tend to all be driven by that same "Let's get it done" attitude.

Williams: So talk about the circumstances that elevated you to the editor[-in-chief] of *The JI*.

Fink: I was on the Publications Committee, and I've always loved to read and write. Ever since my first science paper, I've enjoyed the process, and I was always

stunned to hear colleagues just hate writing, you know, "Worst time of my life was writing my thesis."

And I was like, "Really? Because I loved it. I thought it was great." I love trying to think of how to say things, and a nice little turn of phrase would feel great. A good title just made me excited. I don't know. So to be on the Publications Committee, it was really very fun, and from there, I put in an application to become editor-in-chief and they picked me.

Williams: Who was "they" in that case?

Fink: The Publications Committee, of which I had been a member, ended up making the selections after going through a list of applications and then interviewing I think three, maybe four people. Then I was selected.

Williams: How did that make you feel?

Fink: It was great. It was daunting, because I only sort of knew how much work this was going to be. I mean, you never know what a job is until you're doing it. And I was happy to be given that responsibility. To have that sort of vote of confidence from my peers was really quite nice. Also I was the first female editor-in-chief, which is strange to say, because there were so many women presidents of the AAI, and yet there'd never been a woman as an editor-in-chief. So I was quite surprised to actually figure out that I was the first woman [laughs] and really honored to be so. Yeah, it was really very nice.

Williams: So how did that interplay with your continued scientific work?

Fink: Well, I think most scientists come to a phase in their career when they sort of look outside of themselves and their own lab, and many people join big national consortia or like to consult with big drug companies or take on administrative duties at their own institutions or universities. I didn't really want to do any of that, and so this was the perfect outlet for me. I know this now, and at the time, I think I kind of sensed it, but I'm just happy that I was right about that, that looking outside of myself but keeping within the realm of academic publishing was really a good move for me. I'm really glad I did it. It was hard and relentless because something new comes up every day, but I never did have second thoughts about it. So it was a really great way for me to extend my—I don't want to say sphere of influence because that sounds kind of dictatorial or something, but just extend my interest to bigger issues, how do we compete with for-profit journals, and all of these questions that, really, I hadn't spent any energy thinking through.

Williams: And you served in that role for five years.

Fink: Yes.

Williams: Is that a normal period?

Fink: Yeah, that's the standard. Yeah, five years, and it's like you can't do it for another five. So the start and end dates were very well known.

Williams: So it was frowned upon if you wanted to do it for only three?

Fink: Yes. Nobody has. Let's put it that way. [laughs]

Williams: It's a five-year program.

Fink: It's a five-year thing.

Williams: And you initiated some features of the journal. Can you talk about that?

Fink: Sure. These aren't just strokes of genius on one person's behalf. Everyone contributed to this, including the Publications Committee. But I started a few new sections, the "Novel Immunological Methods" and "Systems Immunology," as a reflection of sort of where the field is headed and trying to capture papers that are really significant for the field that didn't have a very good home, so those are good things.

I started a podcast in which the writers—let me back up. We have this section called "The Pillars [of Immunology]," which are important papers, historical papers, that actually get nominated by members, and we select someone to comment on these papers, put them in historical context, what they showed, any interesting information about leading up to how the work was done, and then how the work impacted the field. They're very short and chatty kind of nice little things. I started a podcast where the writers of these commentaries were asked questions, interviewed much the same way you're interviewing me, and a little, say, ten-minute podcast was put together. I like that because it puts a more human touch on it, and I think you can tell someone's excitement by their tone of voice more than you can in their writing. So those were important.

Williams: When you published these Pillars, did you reprint the original article?

Fink: Yeah, with copyright.

Williams: Did that become—

Fink: Yeah, you can deal with the copyright issues. Many academic journals give free copyright usage or whatever to other academic journals. There were a few that required us to pay and a few that limited the number per year that we could do, but in general, it's a win-win situation for everyone, because these Pillars commentaries are actually put together and given as course material in a lot of academic institutions as well, so every wins by this.

Williams: And you also initiated something called "Brief Reviews." Is that what you mentioned before?

Fink: No. What I did was started topical issues of related brief reviews. We've had brief reviews for a number of years, but we put together issues where sort of a global topic was represented by maybe ten different brief reviews all within the same issue, and then there was a commentary that I would write, for example, explaining how everything fit together and why we put these all together in one issue.

Williams: And then there was something called "Novel Immunological Methods."

Fink: Right. That was one of the sections that we started to sort of give a home for papers, because methodology is increasingly more complex, and sometimes when you develop it, you need a whole paper to explain the development of those methods and all the control experiments that you had to do just to make sure the method was doing what you thought it was doing, and that's very difficult to put together in a paper, where you use that method to discover something new, because now you have two different points, "Here's the method and here's the discovery." It makes for too complicated a paper, so we split them up.

Williams: Interesting. Did you have any real nail-biting experiences during the editorship? I mean—

Fink: Yeah, we did, actually. My least favorite part of the job was dealing with potential fraud or misrepresentation of data. We had one case using x-ray crystallography, which is super complicated and I don't really understand, and once you got x-ray crystallographers talking about their work, I *really* didn't understand it. There was a group, several investigators, that contested the interpretation of x-ray crystallographic data that had been published in *The JI*, and so we really worked hard to try and figure out the best way forward to let it be known that there was a difference of opinion of how these things were interpreted, without necessarily having to retract a paper that did have good data in it that perhaps were interpreted incorrectly or maybe—yeah, incorrectly.

So it was a very difficult thing. It's a difficult little boundary to tread. You don't want to pull something that's still very useful to the literature. You don't want to point fingers to somebody who may have been using out-of-date software to interpret complicated data, but with no evil intent, but you also want to alert people to "Be careful when you read this paper." So it's kind of like, wow, that's a lot of things to try and do in one movement. So I think we handled it well. We took everything in as "Letters to the Editor" so that there was a response and response to that and then a comment on that, so that we put it all out for the field to digest and to talk about.

I know of one person who actually used all of that information in part of a course for students who study x-ray crystallography to show, "Look. Here are the data. There's a disagreement on how you interpret it, and these are the points that you need to convince your readers of."

So I think, in the end, we did actually handle it well, but it was a very difficult thing.

Williams: Was that unique in your five years?

Fink: Yes, actually, it was.

Williams: Right. You joined this large class of Lifetime Achievement Awardees.

Fink: Yeah.

Williams: What did that feel like?

Fink: Oh, it was so great. I was surprised and really honored to be included in this group. I retired in February, so it was just a really nice kind of a deep-breath moment, where, "Wow. Okay. That's great." And I sort of thought about my own career retrospectively, and, yeah, it was a very nice moment for me.

Williams: And what conclusions did you come to when you thought about your life's career?

Fink: Yeah, well, I have no regrets. It was difficult balancing kids and two labs and a junior and a senior career, and I don't regret how we handled any of that. I'm proud to have raised two great human beings who've gone off to do their own things, and I think that's a sign of good parentage [Ed. parenting], when they don't exactly follow you. [laughs] And I'm still married to the same man. Actually, our wedding anniversary was a few days ago, thirty-four years, so must have made the right decision there as well. So, yeah, it's very satisfying.

I think it's also—and I know there's a different of opinion here, but I feel that it's our duty to retire and not just sort of hang on, because when I occupy a position, there isn't a more junior person occupying that position and getting those grant funds, and so I felt it was important for me to end on a high note while I could still go on and still had the energy and, I guess, brainpower to keep going, but to choose that this is probably the right time. So, so far, it's only been a few months, but so far, I feel that that was a good decision to make for me. So, yeah, it's been very satisfying.

Williams: How did it feel to pack up your office and walk away?

Fink: Oh, that was really hard. Actually, the office, who cares, right? That's just administrative stuff. But going through old lab notebooks and looking at all my students' handwriting and the excitement about things that worked and the just drudgery when it wasn't working, I kind of relived it all. I think that's important as well. I don't regret doing that and I didn't want anyone to do it for me, but that was hard, going through and throwing away notes, and sort of the personality of all the experiments is now lost, and that's sort of hard, in a good way, though. It means that it meant a lot.

Williams: You mentioned two children. What careers have they followed?

Fink: Our older son is—this is interesting. He did his degree in mechanical engineering, and, at graduation, announced he didn't want to be a mechanical engineer [laughs], which is fine, and he ended up going into the film industry. He does computer-generated visual effects for film, and he works at Industrial Light & Magic up in Vancouver, British Columbia. He's very good at what he does, so that's fun. It's hard to talk about it to him, about his work, because it quickly involves a lot of stuff I can't understand, but he's very passionate about it, which is what you hope to see with your kids.

And our younger son just is in his second year of residency at Case Western [Reserve University School of Medicine]. He just finished his medical degree and is going into cardiology.

Williams: As a clinician?

Fink: As a clinician. He is just about to undertake a two-year research track. It will be clinical research and mostly data-mining-type rather than wet-bench science, but he does think like a scientist in a lot of ways, so we'll see where that takes him.

Williams: So with two retirees in the house—

Fink: Yeah, I know. [laughter]

Williams: —you must have conjured up some plans for the next couple years.

Fink: You'd think so, wouldn't you. [laughs] I don't know. I was so busy until I retired that I've made an effort to kind of keep it loose. So the first things you do are go through the closets that have been driving you crazy, and cleaning out baby clothes and silly things that you've kept, and reading. The biggest thing for me is being able to read for pleasure when I'm still fully awake, because I used to always read in bed and couldn't handle anything very complicated, and now I can take some really good books and actually think about them and dwell on them while I'm still wide awake. So that's the biggest pleasure. So I can follow authors. I find someone I like, and then I can read the rest of the books while I still remember, because I can read so much more quickly now.

Williams: Fiction, nonfiction, both?

Fink: Well, mostly fiction, but I'm reading nonfiction right now, as it happens. But I like sort of historical accounts of science. But I do want to figure out something where I can feel useful and relevant again. I don't want to be a consultant or anything sort of "science-lite," but I would like to figure out a good use for my skill set either with kids or community activities of some sort.

Williams: And what about—can you speak for Michael a little bit on what his path is going to be taking?

Fink: Yeah, he felt the same way. He ended on a high note and didn't want to *sort of* do science. It's such an all-consuming career that neither one of us felt like we wanted to sort of do it, that that wouldn't be the joy that we've experienced. And he also has just been reading voraciously. We do a lot of bird watching, lots of hiking. He got a dog, so he can walk the dog multiple times a day. He has a whole set of friends in the community also with dogs and knows all about them and their history and their dogs, so that's been fun. We're much more embedded in our community than we ever were when we were working full-time. It's like the quintessential British mystery, where the old lady or the old guy looks out the curtain and sees the delivery truck at the wrong time of day and knows something's up. We're those people [laughs], your worst neighbors.

Williams: So speculate on your view of the status of immunology today and where it's going.

Fink: Well, that's a hard one. I feel so fortunate to have entered immunology when I did, because I think the questions and techniques were more the types of things that I love, where you think deeply about a question, and the hard thing is to know what kind of experiment to do, but then when you think about that experiment, the experiment itself is technically very simple, can be conducted by a single person at one little bench without a lot of equipment. Those days, I mean, they're not over, but the focus now is more on big team science. It's easier now to generate just vast quantities of data, things that correlate with other things and vast computer systems full of this stuff, and the hard thing is to know how to analyze that data and to put it all together into a story, and that is not my strength.

So it's a very different type of science now than it used to be, equally important and equally necessary, but it's a very different skill set and one that I don't share, and so it's difficult for me to listen to seminars where that's the main point and feel like a tug, like, "Oh, wow, wouldn't it have been cool to have made that discovery," and then think, 'Where do you go from here?'" I don't do that as much as I used to, and partly that's age, I'm sure, but it's also style of science. Things really have changed. It definitely is a big-science time of evolution in the field.

Williams: Does it strike you that it's equally fruitful?

Fink: It has a chance of being equally fruitful. I don't hear any paradigms dropping or anything, which I certainly did in graduate school. But there's so much knowledge that's being added to that at some point, there will be a climax of some sort and we'll understand something that we never understood before. So it's just happening in a slightly different way.

Williams: So, looking forward, you think there's a bright future for immunology?

Fink: I do, oh, yeah. I mean, there's so much translational impact now, cancer immunotherapy, just to name one thing that just changes dramatically, and that was all based on basic science that was discovered when I was a graduate student, so it's that quick. Yeah, so there's just remarkable things coming down the pike, for sure.

Williams: And so you would recommend a career in immunology for people that are considering it at the front end of their careers?

Fink: Oh, absolutely, yeah, yeah. And for someone of my interest, the focus would have shifted more to, I don't know, neurology or something that was a field where very few inroads were being made in my youth and now suddenly the tools are there that will allow some inroads. So people with my sort of skill might shift to a slightly different field, but still their skills are needed out there in science as well. Probably they would just focus on something slightly different, whereas now it's a lot of bioinformatics and bioengineering that those people with that kind of skill set are making big inroads in immunology right now.

Williams: So is there anything else you'd like to say, express in this record?

Fink: No, I think you've covered everything, yeah.

Williams: You sure?

Fink: Yeah, I think so. I can't think of anything.

Williams: Well, thank you very much.

Fink: Thank you.

[End of interview]