



The American Association of Immunologists Oral History Project

Transcript

Ellen S. Vitetta, Ph.D.
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Williams: This is an interview with Dr. Ellen Vitetta for the American Association of Immunologists Centennial Oral History Project. Dr. Vitetta is professor of immunology and microbiology at the University of Texas Southwestern Medical Center and a distinguished teaching professor at the UT Southwestern Academy of Teachers. She's also the Sheryle Simmons Patigian Distinguished Chair in Cancer Immunobiology and Director of the Cancer Immunobiology Center at UT Southwestern.

Dr. Vitetta was president of the American Association of Immunologists from '93 to '94, and served as an AAI Council member from 1988 to 1993. She was awarded the AAI Excellence in Mentoring Award in 2002 and the AAI Lifetime Achievement Award in 2007.

We are in the Cancer Immunobiology Center at UT Southwestern. Today is Monday, April 15, 2013, and I'm Brien Williams.

Williams: Let's start now with you talking a little bit about your interests as a child.

Vitetta: Well, as a child, most of my interests revolved around two things that would be relevant to this interview. I loved math. I was very convinced for a long time that I would end up as a mathematician. And I loved animals, and I don't mean just dogs and cats, but ants and spiders and snakes and lizards, and I grew up in a houseful of them, to the dismay of my parents, birds flying around and all this sort of thing. So I was very interested in perhaps becoming a veterinarian.

Those two interests were carried through quite a while, through high school anyway, and then when I got into college, I began to morph a little bit more towards an interest in research and in perhaps medicine and bringing those together, but always with a very analytical mind of a mathematician. Math served me very well in my career.

Williams: Are you an only child?

Vitetta: Yes, I am.

Williams: So you didn't have any competing menageries in the house.

Vitetta: The one I had was fairly, fairly intense. [laughs]

Williams: Right. And what about your schooling?

Vitetta: I grew up in New York for most of my formative years. My schooling was in public schools, and I was always the nerd of the class, and I was also very much into science and math, and I didn't like other subjects. When I didn't like things, I just didn't do them. I've always been sort of one who marches to her own drummer, and one of my proudest achievements was getting a D in modern dance

because I never showed up. But I was at the top of my class academically and graduated second in my class.

Williams: Despite your D's.

Vitetta: Yes, and that averaged in my D's as well, because it was offset by a few very high grades.

Williams: Account for your selection of the Connecticut College for Women.

Vitetta: Connecticut was a small college. It was near New York, so I could commute. I got my degree at Connecticut. I did not start at Connecticut. Where I started, I did not stay, and we won't go into that. But I did graduate from Connecticut. It was close, it was beautiful, and the only thing I would have to say now, looking back at it, is that as somebody who wanted to have a career in science and in medicine and research, it was probably not the best of choices, but it was certainly a very well-rounded liberal arts education. I learned to love art and reading and many things outside of science, which have been useful to me over the years because science is a profession where you have to understand people, you have to be able to relate concepts. It has a certain artistic quality to it, it has a certain analytical quality, and if you can put all those things together, I think it makes you a better scientist.

Williams: What was your major?

Vitetta: I was a double major in zoology and chemistry, and really adored chemistry. Zoology, I loved animals, but I didn't particularly love cutting them up and doing things to them and, in fact, have always been my whole life a big supporter of animal rights groups and humane farming, humane society, etc. Within my profession, I've been a big supporter of humane treatment of laboratory animals and this sort of thing. I think one of the reasons that I never actually completed my interest in veterinary medicine and went to vet school was because I'd get so attached to my patients, they'd all end up in my living room.

Williams: Right. And while you were attending Connecticut, were you living at home the whole time?

Vitetta: No, I was living there, but I could commute back and forth.

Williams: So then what persuaded you—what drew you to NYU?

Vitetta: NYU had a wonderful, wonderful faculty at that time, and I think others may have spoken about this. It was the golden era of science and education at NYU. They had a terrific medical school, terrific graduate school, and I went back and forth between the two of them. I found the people to be very intellectual but very helpful to students. And it was close to home. At the time I went there, I was

already married, with a child. I started very young. So it turned out to be a good location and it turned out to be a really fantastic place.

Williams: So you were there for three years?

Vitetta: I was actually there as a student, I was there as a fellow, and I was there as a faculty member. As far as I was concerned, I was going to spend the rest of my life, if not in New York, on the East Coast. So, of course, coming to Texas was quite a cultural change for me.

Williams: Right. We'll get to that. Talk about some of your mentors at NYU and your favorite people.

Vitetta: There were many mentors, but I would have to say that the mentor that made me into an immunologist and eventually hired me in Texas and became my boss was Dr. Jonathan Uhr, who I know you'll be interviewing, and he was a fantastic immunologist. And actually sitting in second-year medical school listening to his lecture in immunology, it was at that moment I decided I wanted to be an immunologist. A few meetings with him and a few meetings with his colleagues and others over the next few years made it clear to me that's what I wanted to do.

Williams: You have spoken of several what I'd call sort of aha-effect moments. Another one occurred for you at Cold Spring Harbor, didn't it?

Vitetta: The Cold Spring Harbor event.

Williams: That was when you're first attending there a meeting of—it may have been even one of the earliest meetings of immunologists there, I'm not sure, and it had to do, I think, with the B lymphocytes.

Vitetta: I've been to several Cold Spring Harbors. My very first Cold Spring Harbor meeting was as a student, and I went there as a student, as an observer, really. I wasn't a participant. I heard some unbelievable talks by people like Sir Gus [Gustav] Nossal and others, and, of course, Jonathan Uhr talked there, and both of them were interested in antibodies and B lymphocytes, the things that protect us against foreign creatures and infections, and it just reinforced my whole interest in this field.

Williams: Tell us anything else that's memorable about your period there in New York.

Vitetta: I think besides being around wonderful people who were very smart and were very receptive and were very helpful to me, I began to realize that there weren't many women in the field I had chosen, and in those naïve young days was my first awareness that this was a very male-dominated profession, and I sort of tucked that thought away and just moved on with doing what I had to do, but it was the first inkling that maybe things were a little strange.

Williams: Were there experiences that you had personally that—

Vitetta: There were a few but nothing I would say that was totally traumatic, but it was just clear that I wasn't part of the boys club, and that was a first for me, because I had never experienced that before.

Williams: I've encountered several people who have spent time at the Irvington House Institute. Tell me about that.

Vitetta: Well, this was an institute that Jonathan was head of, and it was for rheumatic fever and similar diseases. He ran the Institute as well as the laboratory, and the laboratory therefore contained an interesting mixture of clinicians and basic scientists. Looking back now, some of them have become really incredible well-known figures. We were all young and crazy and interacting and from different backgrounds, and it was just a very exciting time.

Williams: So did you come out here on a visit before you decided whether you were going to follow Dr. Uhr out here, or was that necessary?

Vitetta: Well, yes, it was very necessary. The idea that I would go west of the Red River was to me and my family and friends the most insane possible thing I could do, because we're going back now to the 1970s when it was post the JFK assassination and it was a time where Texas was wild and crazy, and I was an East Coaster my whole life.

Jon came out here two years before I did and tried to recruit me, and I just blew it off. I had a position at NYU Medical School. It was secure and nice. My daughter was growing up in the New York school system, and I was pleased with that.

He finally invited me down for an interview. He told me that this was going to be the best microbiology department and immunology group in the world, and he began to recruit some people that blew my mind. And I said, "If they're going and if they're signing up, maybe this is something I should look at and not be so close-minded."

I'll never forget the day that I flew into Dallas. This was before Dallas-Fort Worth International Airport. I flew into Love Field. The airport hadn't yet opened. I walked out of the gate, and I saw a very large statue of a cowboy in the lobby, and I thought to myself, "I think I will book a round trip back to New York right now. I don't know if I can handle this."

I came over to UT Southwestern, which was then very small, not what you see now, just a few buildings in the middle of nowhere. I looked at it again, and I thought, "Maybe I should book another roundtrip back to New York." [laughs]

As I began to meet the people here, not only the immunologists, but the faculty, I realized that this was a jewel in the middle of nowhere, and I realized that there was no hierarchical sort of culture here, that you could interact with everybody, we were all the same team, stuck off in the middle of Texas, and that maybe this was a place I could really build a career without having to deal with always hitting the glass ceiling, and unconventional ideas that I could do what I wanted to do. So after thinking about it a while, I packed up my family, my St. Bernard, my daughter, and we came to Texas.

Williams: Did Dr. Uhr bring a number of people from NYU here?

Vitetta: No. It was interesting, Dr. Uhr did not recruit generally from NYU. He brought people from around the country. His idea was to have a department where every member of the department was smarter than he was and was in an area that would be different from everybody else in the department. So to bring all these very smart sort of out-of-the-box creative people together and just let them have at it, and that's what he did.

He recruited people from Europe, from California, from all around the world, and I'm still clueless why any of them decided to come, but he's very convincing, and they did, just like I did, and we all arrived here and we sort of started a new culture in a school that had previously very clinically oriented and not basic science oriented, and I have to credit him with establishing basic science at UT Southwestern and being the chair of my department for twenty-five years.

Williams: What was the program like when you first got here? I mean, you've indicated in some degree, but just talk about what it was like in your first couple of years.

Vitetta: When I first got here, it was like being born. There was nothing. There were no rules. There was no agenda. We were all encouraged to interact, and we had some teaching responsibilities, but not huge. The faculty was all approximately the same age, so we were all kind of kids growing up together, and we were interactive and crazy. We had crazy parties. We played hard, we worked hard, and it created a culture, at least in immunology, that I think was unique in the country.

In fact, we had our own band called the Microbes that used to play at all the national meetings. This was well before other bands came along. We were known as being the Texas immunologists. It was well known to everybody. We put on various skits and shows at the annual meetings of AAI, and I remember playing various molecules, and we had an immuno-ballet, and I was in that. It was all orchestrated from Texas, because we were a fun group.

Williams: Despite a D in dance.

Vitetta: Despite everything. [laughs]

Williams: What were your own personal ambitions when you got here? What direction did you want to take yourself in?

Vitetta: I wanted to understand several things, and they had to do with how we make antibodies and why we make antibodies and what kind of antibodies we make and the cells that make them and how they know when there's something foreign in your environment that they should make an antibody against instead of making it against your own liver.

That involved at that time understanding how B cells worked, and Jonathan and I shared that interest and ran a joint laboratory, and we recruited students and fellows into that laboratory. I would say for the first ten years that I was here, we unraveled the nature of the receptor on the B cell and how it was able to sense a foreign organism and many questions related to the whole idea of B cell biology. It was an exciting time because it was virgin ground and everything was new and nothing was predictable, and you had to put things together that didn't seem to go together, and that's just what I love. I love that kind of thing.

Williams: Did you have a sense of competition in that area of exploration in other institutions around the country?

Vitetta: Sure. I think science is by definition a very competitive profession, and sometimes the competition is friendly and sometimes it's not friendly. But I learned very early on that we were really all on the same team, and the competition was not to be ignored or blown off or treated as if they were trying to destroy your work, but rather they were part of a team. So I very quickly got over that personal thing that many people have where they don't like their competitors. In fact, if you look at my publications, most of the time I linked up with my competitors, and we ended up if you can't fight 'em, join 'em sort of thing, and we worked together, and that was very stimulating to me.

Williams: How has the spirit of the place changed over the years?

Vitetta: I think it's changed in many ways that's not unique to UT Southwestern, but it's probably common in many academic institutions. We've grown larger. We were a small, very small group, where we would meet each other in front of the candy machine or outside the restroom or in the halls, and we would talk and there was a lot of cross-fertilization of ideas from different fields.

Then the school began to grow and buildings grew up everywhere, and we became a two-campus kind of institution on two different sides of the street, and a two hospital and three hospital. It became bigger and bigger where you didn't really run into people as often. We began to accumulate Nobel Prize winners on the campus, and it changed. It changed in many ways the culture of

Southwestern. We moved up the list of the best medical and graduate schools in the world, and instead of being a mom-and-pop sort of thing, we became much more well-known, and along with that, there's a certain price you pay.

Williams: How did Dr. Uhr relate to these changes that were occurring?

Vitetta: I think he probably felt them, too, but he and I had shared one feature that I think was important, and that is that we loved our science and we kept our eye on the ball. So when Form 673 had to be filled out or you couldn't inject a mouse, we just made jokes of it and moved forward. We didn't waste our brain space, you know, agonizing and complaining about it. We both had a very, very well-developed sense of the ridiculous and would sometimes lock ourselves in a room and just get hysterical and laugh about all the crazy things that we had to do to get from A to B to C, and it was very therapeutic.

Williams: When did he retire? Well, he's still around, I guess.

Vitetta: He's a professor emeritus here at UT Southwestern and comes by occasionally and is in touch all the time. He retired a few years ago, I can't remember the exact time, but he's never been out of my life of immunology, shall I say, and I always feel I can call him up for advice or an opinion about something.

Williams: So, looking at your career path to date, has it really been very straight or have you veered off in various directions from time to time?

Vitetta: There's no scientist that doesn't veer. We're, by definition, people who veer. I started off wanting to understand the B cell in antibody production and made fairly, I would say, important strides in that area, but somewhere around, I guess, the mid or early eighties I decided that I wanted to do work that was more translational, where I could see it actually moving from discovery into human disease, into human clinical trials.

We were forty people at that time. For a large lab to have the director of the lab suddenly decide we were going to change required three or four years of really upheaval, I would say, in the lab, because people had come to my lab because we were known for our B cell work and our B cell biology, and suddenly I decided that we were going to move it into a more clinical, translational mode.

One good thing I did is I decided to focus on B cell malignancies as the target for our therapies. So there was a general but slow movement from normal B cells to malignant B cells, and that helped us a lot, both in terms of understanding and in terms of having people not feel like they were being thrown into another universe. So we would study the biology of a B cell tumor instead of a normal B cell, and the insights from that would lead us to how we would treat a B cell malignancy, and what we were treating with were antibodies, which we armed with various

warheads. So, as you can see, I gradually moved from understanding to actually using that understanding to do therapeutic work.

Williams: And that's carried you through the last few years?

Vitetta: That went on for a while. I must say when I decided to become translational and clinical, I had no concept. I was clueless as to what it took to actually develop an antibody-based drug and to get it through all the testing that was needed to get it into humans and to move it forward into a company and approval, and that was an entire education for me. Some parts of it were very frustrating and some parts of it were very interesting, and there was a real reality check at that point that made me understand that when you're doing science, basic science research that has down the road some application to humans, you have to think upfront about issues that you're going to face down the road, and that's not the typical way a basic scientist thinks. We have a problem, and we're going to solve it, and we work it out, and that's it. Then we hand it off and go on to the next thing. And I learned I don't do that anymore.

For example, if I have a good idea, I immediately file a patent so that I know that down the road if it works, a company will take it, because if it's not patent protected, nobody will want it. I've learned to think about issues like is this practical to develop for a human. It's one thing to treat a mouse, but can you really make the quantities and the purity and everything that's required to make it a real drug. That was an education.

In fact, one of the really exciting parts, at least for me, was building on this campus the very first what they called GMP laboratory, where we could make the drug in-house. We had a little manufacturing laboratory. We would actually make it, and we would put it in vials and we would do all the FDA quality control ourselves. We would design all the clinical trials, and we would get all the patients lined up, so it was all done by us. We didn't send it to a company. We didn't farm it out. We did it all.

I think one of the really interesting things about this is it requires that you have five people sitting in a room who normally could not understand each other. You need a clinician who needs to talk to a biochemist; and a biochemist who needs to talk to an immunologist. And sometimes insights come from the strangest places. A clinician will say, "Well, you know, we used your drug and we found *x*."

And the biochemist will say, "Well, maybe that's because we didn't put the disulphide bond in the right place, and it's sensitive to something in vivo." So by all these cross-fertilization of ideas and observations, we would go back and tweak the drug, and you would never see that if you didn't have a multidisciplinary group. So it was very exciting to me that a small group could actually develop a drug, and we did. We developed several of them.

Williams: Why don't you name them and their applications.

Vitetta: Our main platform to begin with was to take monoclonal antibodies that recognized disease-causing tissues, for example, a tumor, a B lymphoma, and we would take that antibody and we would attach it to a warhead, and our particular warhead was a piece of the toxin ricin. We would then send that into a mouse to start with, and it would home to the tumor, and it would be internalized, and the tumor cells would be destroyed. So it was literally a ballistic missile, and it was incredibly effective in mice, and we were able to develop a procedure. Not easy to scale it up in our GMP lab, because, after all, you now had to make it extremely sterile with very defined conditions acceptable to the FDA, homogenous, able to withstand storage and quality-control testing, and then take it into a human clinical trial.

What dose do you use? Where do you start? The first trials you do in humans are not to see if you cure anybody; it's to see if you don't kill anybody. So you take very terminal patients who have nothing else for them, and you gradually escalate a drug, and you see when side effects start to happen. And when side effects start to happen, typically in a company that's the end of the drug, but in academia, the difference is we could go back and say we've got a side effect and we've got to understand it and we've got to get rid of it, and we would reengineer our molecules.

So we have immunotoxins that we developed and are in the pipeline for lymphoma, for graft-versus-host disease, for leukemia, for a variety of different targets. They reached a point where they were tweaked to get rid of all the unwanted side effects, and we retained their activity, and at that point we licensed them out to companies for the final major testing, which was beyond us, huge clinical trials that are multi-million-dollar trials. But the nice thing was that we felt we got it right before we handed it off. So it made it through the process.

Williams: So currently those are in trials still or on the market?

Vitetta: No, they're not on the market. They are still either in trials or preparing for trials or whatever, but it was very rewarding to me that we gave them licensed-out drugs that we had optimized before they even had to look at it. So whether they shelve it or not will depend on markets and on prices and on things that won't be necessarily scientific.

So those were the first drugs, and then we got very interested in vaccines as a direct outgrowth of our immunotoxin work. The first vaccine we developed was actually a ricin vaccine, because ricin is used for espionage. It was a big worry after 9/11 that it would be used for all kinds of terrorist operations, and I was contacted by the Department of Defense to discuss this, because we had been using part of ricin to arm our anticancer antibodies. So if anyone understood this toxin, it was me.

We realized after studying this for so many years that we knew exactly how to make a vaccine as long as they would pay for it or give me a grant to do the work. We developed a recombinant ricin vaccine that was totally safe. We could grow bacteria in the laboratory and purify in two steps and make in huge quantities, and we actually carried out two clinical trials on volunteers here at Southwestern, our medical and graduate students. It was a very exciting time to actually do that. The trials worked beautifully, and the vaccine is now awaiting further steps. We hope to move it to the national stockpile. So that was exciting.

Then, of course, having now done therapeutics and vaccines, it finally occurred to me how we might make vaccines for more ordinary things, viruses, infectious bacteria, and we're currently working on a platform that we're very excited about, that we think may be applicable to things like hepatitis and West Nile virus and HIV, entirely out of box, typical me, upside-down-backwards approach, and that is being studied now in the laboratory.

Williams: How large is your laboratory now?

Vitetta: Now it's small because of the funding cuts. We went from forty to thirty to twenty to twelve, and now I think we're at about ten, and grants are hard to come by. We have to make really careful decisions whether we'll do this experiment or that experiment, whether we'll use ten mice or six mice, and it's become a huge source of frustration to me because when you have something going and working, you want to just go at it. And I have to sit with budgets and figure out just what I can afford to do, and it's not always what I want to do. Until our government decides to put more money into the NIH and NSF and biomedical research, I think it's going to be extremely hard to do what I've done in the past, extremely hard.

Williams: When you shifted over to translational, did you bring along a lot of your colleagues, or was that pretty much you and a group of postdocs doing it?

Vitetta: It was all us. I mean, it started with Jon Uhr and myself and postdocs and students, and we just kind of shifted the culture in the laboratory, and then we linked up with a number of clinicians who would help us with the clinical trials. Some of them were done on the campus here, some of them were done at the NIH, some of them were done in England, and it was necessary for us to agree on how a clinical trial would be done that would satisfy my scientific analytical brain as well as their ability to recruit patients into these trials and promise them that they were doing something useful, but we didn't expect to cure them.

Williams: When you described how Dr. Uhr attracted people to the department here, you said that they were in many different areas, and it seemed very disparate and exciting, because you're knocking heads with people with other interests.

- Vitetta:** Right.
- Williams:** But now it sounds like maybe it became more cohesive, or am I wrong about that?
- Vitetta:** In terms of where we are with the vaccine program, etc., no, I would say it's just the opposite. I would say that we've had to get more interdisciplinary. For example, we do much of our chemistry now for this new vaccine platform for viruses and bacteria with chemists who work in Berkeley, and we actually send our students and our fellows out to the Berkeley laboratories where they do hardcore organic chemistry. And we have to work with virologists who have to test these things. So not only have we become interdisciplinary within the group, but we've expanded to work with multiple groups around the country who do their specialized thing as well, and that is even more exciting to me.
- Williams:** Do you still spend time on the bench?
- Vitetta:** No, I can't spend time on the bench. I stopped working at the bench about fifteen years ago. The last really wonderful year I had at the bench was when I did my sabbatical at the MRC Laboratories in Cambridge, England, and it was terrific because I had students showing me how to turn machines on that I had never seen before. So, of course, they regarded me as a bit of an idiot, but at the same time, having been at the bench for so many years before that, I would know you don't put glass tubes in a centrifuge or they would break. So I also gave them a lot of practical tips that helped them, so it was a two-way street. I, for many years, went into the laboratory in the evenings and on weekends to take care of changing buffers or staining gels or those sorts of things.
- Williams:** There or here?
- Vitetta:** Here. And I go into the laboratory occasionally, but mainly I am the strategic planning person, and I have meetings of the group, and assignments are made and protocols are written so I know exactly what everybody's going to do, and that way I'm sort of virtually in the laboratory. I'm not there, but I know that they're going to centrifuge this three times instead of four times, and we discuss that before they actually do it. So that keeps me connected with the actual lab procedures.
- Williams:** You've already covered this. I was going to ask you about the balance, how you set the balance between science and administration and leadership and marketing, really. I mean, there's the industrial side of things, too, isn't there?
- Vitetta:** Yes, absolutely. I mean, you have to learn about eighteen new things, and then you have to decide if you're going to remain sane to do all eighteen, and who you need to help you to get through this. My life now is a mixture of all the things you mentioned. I have to be heavily into the science, heavily into the administrative part, dealing with the FDA, dealing with compliance, dealing with

clinical protocols, analyzing data from patients and volunteers, thinking about who to license these things to once they're developed and getting them on board early enough so that we don't miss things that will have to be mopped up later, and you just do it.

You learn. You make mistakes. You learn from them. There's a heavy dose of common sense. There's a heavy dose of people skills. There's a heavy dose of closing the door and screaming occasionally. But you learn and you realize, just like I realized early on, the key is to keep your eye on the ball and not waste brain space agonizing over things that either other people can help you with or you can learn or that annoyed you that day, but realize you just keep moving forward, and that strategy and that philosophy has helped me do this.

Williams: Does the overall administration play a role when you're making these decisions, and is there a legal team that you involve or not?

Vitetta: When you say "overall administration," do you mean my administration at UT Southwestern?

Williams: Yes.

Vitetta: No. I am a tenured full professor, and whether I choose to work on fruit flies or new therapies or vaccines, it's totally up to me as long as I can pay the bills, which means raise the grant funds, and they really let us have that freedom. Now, that said, I think any academic institution would prefer that people like me stick to making great discoveries, as opposed to slogging through how you scale up a drug in a laboratory and do clinical trials. But I've pretty much learned to ignore that. I just move forward.

Williams: But what I was thinking is when it comes time to negotiate with Merck or one of the pharmaceuticals, who do you fall back on for reading the small print?

Vitetta: We have at Southwestern, as all schools do, a Technology Transfer Office, and they work with patent attorneys outside of UT Southwestern. I have also done my own patents myself outside of UT Southwestern, and then we're required to give them to the university. So part of it is done through Tech Transfer, part of it is done by my being a renegade and going outside and patenting and then turning it over once I've done it, and you learn to deal with these things. You learn to deal with the business community, and you need to learn how to do all these things.

Williams: For ten years you chaired the Women in Science and Medicine Advisory Committee, and I wasn't clear on—was that here or—

Vitetta: That was here at Southwestern, and that was one of the most interesting and productive and frustrating experiences I've ever had in my career, and it went something like this. We had a fiftieth anniversary celebration of UT

Southwestern, and we had a very large symposium where we had [James] Watson and [Francis] Crick and [Sydney] Brenner and [David] Baltimore, and you name it, and there wasn't a single woman on the program. So the women here, who were still few in number, began to contact each other and say, "There's something amiss here."

So two of us, another full professor in biochemistry and myself, took it upon ourselves to formally complain to the president of UT Southwestern, and that brought the local Dallas newspaper into the picture, which is a no-no here. We found ourselves sitting up in the President's Office in, as we call it, the tower here, the big tall tower building, and complaining that this was unacceptable. It was sending a bad message to the women here, you know, it's all males, and we needed to do something.

The entire organizing committee and the president sat in that room and listened to us and were befuddled that they were so upset about this. But the president, Dr. [Kern] Wildenthal, was a smart and understanding man, and he managed to raise funds to establish a standing committee at UT Southwestern called the Women in Science and Medicine Advisory Committee, known as WISMAC. The first chair of WISMAC was me, and WISMAC did several things that I think are dear to my heart and I consider really important accomplishments in my career. We got a Childcare Center built on the campus. We got a distinguished lectureship each year for a female scientist or clinician or policymaker. We got a directory of all the female clinicians and scientists on campus, so you could find yourself a doctor or you could find yourself a mentor or whatever.

We started a series of receptions, the themes for which were directed at women: how do you balance career, and how do you balance career with family, and how do you deal with confrontation or sexual misconducts or anything like that. Then there were receptions and themes like what's the best way to achieve tenure here, and how is it to be a director? What do I face that they would have to face if they had my position? Those have really been enormously helpful.

So we bring in speakers; we have luncheons; we have themes; we now have childcare; we have distinguished lectureships. As a result of all of this, the number of women has pretty much doubled on this campus. We have given presentations on the hiring of women and the retention of women here and the things that are important to women, which are different than the things that are sometimes important to men. And it's been very successful.

Williams: It's ongoing?

Vitetta: Oh, yes. I was chair for ten years, and I thought at that time it would be good to pass the baton, and I did, and it's been going ever since, and it continues to grow into something that is now very well known. When a woman is hired here on faculty, they are given a packet that tells them everything they need to know

about childcare, about the seminars, about who to talk to if they have a problem, an issue with their director or their chair, and it's made a huge difference here. It's not solved yet, but it's gone a long way, and I'm really very proud of that.

Williams: What about the balance between men and women in your graduate school and postdocs and so forth?

Vitetta: I would say that the balance here is pretty much the same as everywhere, and it goes something like this. If you look at our medical and graduate students, it's fifty-fifty male and female. If you look at our assistant professors and then our associate professors and then our professors, it's a pyramid. So by the time you get to the top and you look and you ask how many female chairs do we have at Southwestern and the center directors, it's four. We're talking about 10, 12 percent.

Having watched that, I realize we're stoking the pipeline with a lot of women, but they're dropping out or leaving as they move up the ladder. As you know, this is a very popular theme these days, why women don't stay. Is it our fault, or is it the system that discriminates against us? I have my own views of why it happens, so it's really a mixture of factors, and I think this recent book, *Leaning In*, addresses many of them that I've dealt with myself.

Williams: What are some of the top ones, your candidates?

Vitetta: I would say that there is an inherent but not intentional feeling on the part of many males that it's hard for them to have females as equals at the highest levels. So it's fairly easy when you're starting. You're all in the *Titanic* together, and it's rapidly going down, and you're each for each other. But as you go up the ladder and your competition is male versus female, this sort of attitude that you have to be twice as good and work twice as long to be a female just happens.

You've probably read about this, but there have been experiments, experiments where grants have been reviewed with a female name versus a male name on them, and the predictable occurs. So part of it is this unconscious sort of fear of having a woman as an equal at the top of the ladder. That said, I think there's less and less intentional sort of sexism, and we're more aware now that women have to be treated equally, and we have rules about that.

But I think the other half that people don't appreciate is women themselves choose not to get to the top. And why do they do that? And I don't think it has much to do with the family, the family versus work if you'll—I don't know how to put it, but being pulled in two directions. I think that's a problem, there's no question about it, and it was a terrible problem when I started. But now with childcare and with leave and—for example, here a female or a male child provider can take a year off the tenure track, which is also something else that WISMAC did. So it's not so much a problem. It's just a very hard time for a woman.

But I think what happens—and this has been my personal observation—is that women don't like combat and they don't like confrontation. They tend to like interactions and camaraderie and working together. And as you move up the ranks, there's a lot of competition and combat, and women just say, "I don't need this. I can be happier doing something else. I don't have to go in with my helmet on every day."

So a lot of them just choose to leave this and go into, if they're a physician, private practice, or if they're a basic scientist, into a pharmaceutical company where there's a less stressful, more equitable situation. So it's hard, and I find myself sitting with the other chairs and center directors, usually one of the two women who shows up, and I find that room very filled with testosterone. I have to realize that, and I have to know that when I say something, that it will be listened to and not commented on, and then ten minutes later a male in the room will say the same thing, and everybody will say, "That's a wonderful idea." And I have to realize that it is that way, and I just learned to realize that if it's implemented and it's a great idea, it was my idea, and I have to be happy with that.

But someday maybe it won't have to be like that. The good news is I'm sitting there. So I'm very pragmatic that way. I try to change it, and I try to tell women what they'll be up against and to not buckle at the knees, but appreciate this is the way it is, nobody's out to get you, it's not intentional, we're just different genders and we think about different things.

Williams: Speak for a moment about Linda Buck.

Vitetta: Oh, Linda Buck. Linda Buck was my second graduate school student here, was working in our B cell group, was a very ordinary graduate student among several, but had one extraordinary quality, and that was that she asked more questions per unit time than any student I've ever had. And she would follow me into the restroom to ask questions, she'd follow me down to my car to ask questions, and the questions were sometimes insane, but sometimes they were incredibly interesting questions. She also had an enormous amount of stamina. When she got her teeth into something, you couldn't yank her out without yanking her teeth out at the same time. [laughs]

So, between her questioning and her stamina, she went off to do a postdoctoral fellowship initially, at my suggestion, in immunology and moved on from there to a neurobiology laboratory. We stayed in constant touch, and we would tell each other the various things happening to us in our lives. I gave her a lot of advice about negotiating the shark-filled waters.

I remember the day that they submitted their paper, which would eventually be the basis for the Nobel Prize, Richard Axel and Linda Buck. When I saw the

paper, she sent it to me, I knew this was a Nobel Prize. I knew it. It was so incredible, and it was really a question of time and politics, and since Linda was a fellow when she did the work, whether the prize would go to her mentor or her or both of them. But as soon as that paper was submitted, she left the lab where she was at, and she established her own lab at Harvard, and she continued full speed ahead, and Richard Axel continued full speed ahead, and they both managed to feed the concepts and continue their work. The work was extraordinary from both of them.

I remember the call I got after she'd heard from the Nobel Committee. Very early in the morning she called me and she thanked me for teaching her how to do science. And since I'm a consummate teacher, that was, for me, one of the most wonderful things I've ever heard from a former trainee. So I was very excited and went to Stockholm with her and was there for stuff for Nobel Week and found it incredible, really incredible. And it doesn't get better than that. And to have her as a woman who did that and who had to fight some of the same battles that I did and stuck with it, it was extraordinary.

Williams: Let's talk a little bit about the American Association of Immunologists. You were president from '93 to '94, and have been a member since '74. As president, are there some outstanding memories from your year?

Vitetta: There are actually many. I enjoyed my stay on the Council, six years altogether, and watching how an association deals with all the multiplicity of issues and problems and journals and elections and all these kind of things. I happened to fall during this period of time into a time frame where one executive director was leaving and another was coming in, and so it was like the deaf leading the blind, and I was president, and it was a very interesting year.

Because of that, two very good things happened. One was some of the things I wanted to do as president, like begin a series of awards, like Lifetime Achievement Award, like Young Investigator Award, these were my ideas and I was able to implement them because neither the outgoing or the incoming director had anything to say about it, so I had pretty free rein to suggest a number of things that I did. And I really bucked up the Women's Committee, and that was exciting to me. It was really interesting to hear all the different opinions in the room of the people coming from different areas in immunology.

But to get more directly to your question, I think the most memorable day in my life as an immunologist and a member of the AAI was the day I gave my presidential address. We were in California, and I was in the presidential suite that all the presidents stay in, and I had my daughter with me to enjoy this. I got awakened at eight in the morning with a telephone call that I had been elected to the National Academy of Sciences, and my presidential address was scheduled for that afternoon, and so to have this happen on the same day.

Then about four hours later, I got a call from the dean at UT Southwestern congratulating me but also telling me that I had won the Outstanding Faculty Teaching Award. And then I gave my presidential address, and when I came back to the room, flowers had come from everywhere, from every country, from every state. The room was festooned with flowers. My daughter was answering the door and finding places to put the flowers, between the National Academy and the teaching and all these things at once. The address went fine, my presidential address, which I dedicated to Jonathan as my mentor.

Then that evening we had planned for six months to have a reunion, a twenty-fifth reunion of all the members of our laboratory. So that evening, I don't know how many people, forty, fifty people from around the world came back, including Linda Buck, including people from Australia and Europe. We had planned out a set of skits where I imitated students, and various irreverent funny things.

So I went from the National Academy at eight a.m. to the teaching award, to the presidential talk, to this incredible reunion where I was dressed up like a graduate student with a backpack and saying all the crazy things they say. I remember one particular skit was called "The Rehearsal," where I did an imitation of listening to a graduate student's first presentation, and I made all the mistakes that they make. It was hilarious, because I put them all together into one talk.

So I went from very touching to very funny, to very honored, to very funny again, all in one day. And I had my daughter with me, which was exciting, too, because she was able to experience this with her mom, who she always thought was crazy anyway, but she realized that maybe there was something beyond that.

Williams: That's great. Did you create the Public Affairs Committee at the AAI?

Vitetta: Yes, yes, I did.

Williams: Talk about that.

Vitetta: Well, I decided, looking at the other committees, the other associations of scientists that were then part of FASEB, that the immunologists really weren't very active in dealing with our government. I could see on the radar that this was going to become increasingly important with budgets beginning to shrink and many issues coming to the fore and that we needed to have a presence there. So I created the first Public Affairs Committee, as well as the other things I mentioned, the mentoring award, etc., etc.

So I felt we needed two things. We needed to have some acknowledgement of people who did important things, whether they were young or career important things, and we needed to hook into a system where we could interact with our government and show them why immunology was important and why they should care whether there was a B cell or a T cell. It also would help scientists such as

myself stand in an office with a senator, or in my case once with Hillary Clinton, and explain what we were doing and have them actually not fall asleep or go into a coma. And that was important to me. I think we scientists don't understand that we can't expect support and excitement from people when they don't understand what the hell it is we're doing, and that was important to me.

Williams: Elaborate a little bit on your meeting with Hillary Clinton.

Vitetta: Oh, it was interesting. Hillary was then very into her healthcare interests, and I was called upon in a context we won't go into, to talk to her about these issues and what immunologists did and why it was important and why it should be part of her thinking, research in immunology. I found her to be incredibly brilliant, incredibly brilliant and insightful, but incredibly removed from any understanding of what it is we actually do and the day-to-day slogging through the trenches for a scientist and that a mouse may cost \$40. These are things that most people don't understand.

I also realized then in speaking with her and subsequently others that the government has to allow scientists to do what it is they do best, which is to be creative and thoughtful, and not tell us we have to work on AIDS or Alzheimer's or biodefense, that the best ideas will not come from directing us, but by putting money into a pot where we compete for the best ideas, and eventually out of that will grow something that's very useful.

I don't know if others have spoken about this, but over the years it's become more and more directed towards what the government wants us to do, and I resent that, because a cure for cancer could come from a molecular biologist who doesn't know what a cancer cell is. And I think they need to let us do what we do best, which is think.

Williams: She was first lady at the time.

Vitetta: Yes.

Williams: While you were president, you distributed that *Scientific American* article to all members of Congress and their staff? Do you recall that? The article was entitled "Life, Death, and the Immune System."

Vitetta: No, I don't recall. I was constantly distributing things, just so you know. I was personally active too.

Williams: I saw, I think, your cover letter that you sent up to members of Congress.

Vitetta: There are a number of them that I did. I also flew to Washington and spoke to various congressional offices. I've been fairly active myself, not as active as I'd

like to be, because you can only be active at so many things, and the women's thing was my number-one priority.

Williams: Do you think the AAI today is different from what it was like in the mid-nineties, or not?

Vitetta: It's hard for me to say since I don't sit in those meetings. You're talking about the AAI Council or the AAI as an association?

Williams: As an association.

Vitetta: Well, I think the Association has changed. I think it's grown larger, obviously. It's become much more multiethnic. It's become much more—the word that comes to mind is “political,” but what I mean is that people now are very afraid, because of the limited funding, to insult anybody, because they might have something to say about their grant application. So people are much more careful about what they say or about confrontation or questions, while when I started in the Association in '74 and when I was president in '94, you could get up at a microphone and you could say, “That's the craziest thing I ever heard. You just did that experiment wrong. It's not the way it should be.” And people were okay with that, and now they're much more guarded and much more afraid of the system, and I think that's bad for science. I think we need to remain open and we need to argue. Arguments are always a wonderful thing in science because it makes you clarify your own thinking to listen to your own words coming out of your own mouth, and you suddenly realize, “Wait a minute. I haven't really thought this through.” So it's changed, but I don't think it's changed any more than many other professions.

Williams: I have a list here of law cases where you appeared as an expert witness. Talk about that experience a little bit.

Vitetta: Well, I'm considered to be an expert in fields that have to do with translational research, getting monoclonal antibodies and various immunotoxins, immunoconjugates through from discovery to sales. You probably know this, but monoclonal antibodies are the biggest new therapeutic drugs. They make billions of dollars now. When I started, everyone said it was ridiculous, no one should even study them.

So I lived the life of this whole field from the time they were first described in '75 until they went into clinical trials and beyond. So I'm frequently called upon by companies who are either suing other companies or various patent issues to be an expert witness because I have the experience of having been there and seen what actually went on. And I do that for two reasons. The first reason, I find it incredibly interesting to see the points of view of companies and what they actually think they did do. I find it extremely interesting that nothing is black and white, absolutely nothing. It's just amazing. They tell me what the case is, and

they say, “We’re going to hire you for this side.” But I could just as well argue the other side, because nothing’s black and white. It’s all gray.

So I find it interesting. It makes me brush up on my own skills and the history of various things. They send me documents and patents, and I have to reinterpret them back twenty years. I have to take my brain back, and then I take my brain forward again and try to put the two together. That part is extremely interesting.

I find talking to juries very interesting because you’re taking people in everyday life who don’t know an antibody from a hole in the wall, and you’re trying to convince them that this person has infringed on that patent for something they are clueless. They’re just waiting for lunchtime so they can have their sandwich. And you have to be able to get up there as an expert witness and you have to grab them. You have to make analogies to things they understand, how to make an apple pie or how you put gas in your car, and reduce everything to an understandable analogy so that they can think through the problem. That’s a lot of fun because I’m a teacher at heart, so I like that.

The other thing that’s very nice about it is it’s a great way to raise money for my Center, because if you write a grant for \$100,000, you put in hundreds of hours and you get it or you don’t get it. I know for every hour I’m on that witness stand, there’s money going into my Center. So I feel that at least it’s a guaranteed way to help support my Center.

Williams: As a consequence, do you become longwinded?

Vitetta: No. I’ll tell you what takes the time. Where you make money, the most money, is not actually when you’re in court, but the preparation, because a box will arrive, and I’m not talking a box; I’m talking a *box*. In there will be sixty documents that you have to read in two weeks and have an eight-hour conference call and be able to go line by line and comparison to comparison and keep it all together. And the reading of those documents and the thinking and putting your arguments together is very time-consuming, so you charge a law firm for the hours that you spend.

Then, of course, you’re deposed by the opposite team, and you’re in a room for four hours being questioned and challenged and yelled at, and you’re getting paid to be abused for those hours. [laughs] I mean, I think it’s really interesting. It’s really interesting and exciting to me.

Williams: What advice do you give your trainees today about careers in the field?

Vitetta: That’s a hard question to answer, and it depends very much on the person I’m advising. If somebody wants to be like me and wants to be eventually a chair or a director of an academic institution, they have to be the sort of person that I know—they’re all smart; they all know how to do experiments—that I know has

that stamina and that tough skin and that drive to do it. And if they don't, I say so.

On the other hand, if I have somebody who's terrific at the bench, has hands of gold and can make things happen, they shouldn't be a principal investigator. They don't like to give talks, let's say, they don't like to write, but they're terrific at the bench, I have to say to them, "You'll get this degree, and then I think you should go work in a technical capacity, maybe for a pharmaceutical company or a big lab group where you're one of the many people there."

So I try to tailor it to where I see their skills are and not try to tell somebody who can't take pressure, who can't get up and say what they think, that they can be a dean someday, because it ain't gonna happen. It makes me really tailor my advice to each person.

But I would say in general that going into science nowadays is a very, very tough call. It's harder. There's more failure. The environment is less friendly. There's less money. So you can't just be smart and have good ideas. You've got to learn to pay for those ideas, to raise the monies, to deal with big groups, to deal with business and patents, and all this sort of thing. So that's different than where when I went in, you just went in the lab and you had a good idea and you did an experiment. It's not like that anymore, and I miss it.

Williams: Talk about it being less friendly.

Vitetta: I think it's very simple. My analogy would be if you put six rats in a cage and one food pellet and come back in three days, you're going to have two rats in the cage. If you put six immunologists in a room or six scientists in a room with a 6 percentile funding, it's going to be the same thing. People become secretive and they become more competitive and less friendly and less open, and they feel squeezed and stressed.

I think if we could restore our budget nationally to what it used to be, about 20 percentile, any good study section can pick one grant out of five, or twenty out a hundred. We all can do that, with a few exceptions. But to pick the top six out of a hundred, you cannot do that. It's impossible. And I've often said that the fairest way nowadays would be to pick the top twenty and throw them in a hat and pick six out. So it creates incredible stress and incredible pressure on people to be able to know whether you're going to be funded and whether you're going to be able to continue your lab for another year, and stressed people are not interactive friendly people.

Williams: So describe what you see for the future for the field.

Vitetta: Oh, my. I think unless things change at a government level, federal government, and they understand that you can't buy cures and that you've got to openly fund

bright people and you've got to invest in humans and invest in science, we're finished. That's how I see it. I think they've got to understand it's going to require a certain number of dollars to invest in a certain number of people, and if you're not willing to do that, people are not going to come to this anymore. They're going to go into computer technology and they're going to go into the kinds of things that we see now happening with communication and with things of that nature. They just don't want to fight the battle every day. And I think our government is just incredibly unrealistic when it comes to what it takes to actually do science, and I don't know what to do about it.

Williams: Do you consider this an American problem?

Vitetta: No, it's global, but we were or maybe still are the leaders in the scientific arena, and now what's happening is that we are squeezing the brightest people out into other professions. They'd rather go to work for Facebook or work for Google or start up a company, and people at my level who are senior scientists who are good at training the next generation will be thrown out of the system because they're going to take the little money they have and fund the people coming into the pipeline, and there will be nobody there as role models or people to train them or give them advice. So it's falling apart at a lot of levels, and I think it could all be rescued if the government would understand that they have to invest in science, and I hear it all the time when I listen to our president or our Congress or our Senate say that we're going to be on the cutting edge of science in the world and we're the best and the brightest. But those are words.

Vitetta: What do I do to have fun? Well, I find science a lot of fun for one thing. I grow things. I'm an orchid breeder. I actually make orchid crosses and show them at orchid shows and win prizes and donate them to my Center. So I love growing things. I'm very big on growing things and genetically engineering things. I love flowers. I love gardening. I love anything to do with life.

I enjoy volunteer time with animal organizations. I read a lot, I'm a big reader, and I don't mean just books. I read everything. I read women's magazines. I read science magazines. I read *The Wall Street Journal*. I read fashion magazines. I read things on the Internet. I go to Reddit and YouTube and watch things, because I like to see how people think and how people are. I'm very interested in behavior. So that's a big part of what I do is reading and trying to understand people.

And, of course, my family I should mention. I spend time with my daughter, who's an artist, a very good artist, and she also works on the Macintosh books for Apple computer. She's very high on the food chain there. Terrific artist and very creative.

Williams: Is she a Texan?

Vitetta: She was born and raised in Texas, and she lives in San Francisco.

Williams: Have we left anything unsaid today? I'm sure we have. But are there some things that I haven't prompted you on or that you'd like to say?

Vitetta: I don't know. I'm just thinking. I don't really think so, unless you have some things that come to mind. I mean, you've done all these interviews. Have there been themes?

Williams: Well, somewhat, and you've expressed most of them. I guess one final question I have, sort of, is just talk about your energy.

Vitetta: My energy?

Williams: Yes.

Vitetta: At my advanced age? [laughs]

Williams: You added that. That wasn't in my thought at all. But, I mean, it's just as you described yourself as a little girl developing your insect colony—

Vitetta: My ant colonies.

Williams: —your ant colonies, you were abuzz then and you still are.

Vitetta: I have always been somebody who never sits still. I've always had too much energy, worn everybody around me out. I try to thrive on enthusiasm and the positive and put the negatives away because they wear out my brain, and so I try to see the glass half full all the time. Now, sometimes things get to me, but I think one of my fortes as a teacher, and it's one of the things I'm actually better at than being a scientist, is that I can stand in front of a class and get them excited. It's a combination of energy and your own enthusiasm and involving them in your energy and so they get excited.

There's nothing more important to me than seeing young people get excited, rather than sitting there staring at a cell phone and texting each other, to actually stop texting and look up and say, "My goodness, I didn't realize that our bodies are only 5 percent human. The rest of our cells are bacterial and etc., etc." And they suddenly realize this is exciting. Or that, "Cells in my body and my liver came actually from my mom, and I'm part of my mom." And they listen to this. I use these kinds of examples to make them begin to think. How does the immune system know that I'm part bug and part mom, and how does it know what to attack and not attack? That draws them into immunology, and that energy from them sustains my energy. So it's a two-way street.

I find nothing more annoying than to listen to a lecture or a student or anybody who just is boring and doesn't care. I get excited by someone who does their job well, whether they're cleaning the floor or whether they're running the country, and I can't stand people who don't want to do a good job and aren't enthusiastic about it. They might as well be dead. So I hope until that happens to me, that I can get people excited, whether it's science or women's issues or politics or whatever it is.

Williams: Good. Thank you.

Vitetta: You're welcome.

[End of interview]