

Surgery Chief Resident Oral History Project

Dr. Hanghang Wang, MD, PhD

By Justin Barr, 3 May 2020

Keywords: Hanghang Wang, China, Duke, Surgery, residency, Johns Hopkins, cardiac surgery, Grinnell, Dartmouth, Joe Turek, Mani Daneshmand, Brian Gulack, Danny Nussbaum, Seigler, VA, Lisa Tracy, Jeff Yang, PhD, bioinformatics, Svati Shah, metabolomics, mass spec, Allan Kirk, John Migaly, trauma, acute care surgery, Cynthia Shortell, COVID-19, Ellen Dillavou, Richard McCann, Tom Novick, Peter Allen,

Justin: Good afternoon. This is an interview of Dr. Hanghang Wang by Justin Barr on the 3rd of May 2020 in Durham, North Carolina. Thanks so much for joining us, Dr. Wang. I really appreciate your help with this project.

Dr. Wang: Thank you.

Justin: Do you just want to start with where you grew up, where you went to school, how you ended up in the United States?

Dr. Wang: Sure. I grew up in China. I grew up in a very small city called Yangzhou, a very ancient city with a history of 2,500 years, on the East coast of China. I was there for most of my childhood until I was in high school, and then I went to Nanjing, which is the state capital, for high school. I had wanted to come to the United States, since when I was in middle school. I had an exchange teacher in my middle school, Mr. Chris Fray, who was from Connecticut. I learned a lot from him about the United States, and I really wanted to see the outside world, and that's when I decided I wanted to come here. I taught myself English mostly. I had a teacher at the very beginning for a year or so, and then I had another teacher for one year, and then for the rest of the time I taught myself.

Justin: How did you teach yourself English?

Dr. Wang: Well, since I got started with a teacher with the ABCs, at that point I was in elementary school, and at that time in my city, students didn't start learning English until middle school. I was probably two years ahead when I got started. When I got to middle school, I decided just to buy all the books for high school English in China, and I finished it in a year. When I was in eighth grade, I started studying the textbooks for English in college, and I finished those in a year. Then I mostly listened to-- Well, back then there were not even CDs -- so cassette tapes of English classes. Then there was a book called "Family Album USA." I still remember that book. It was mostly conversational English, introducing an American family and American life. I read the entire book, memorized all of the conversations to the point where I could just recite exactly what they were saying and imitate everything they were saying.

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Justin: Is it pretty common for people in China to learn English to that degree when you were growing up?

Dr. Wang: No, it was not. You were taught English in school and that's about it. I had no one to practice with, actually. I would talk to a wall; most of the time I would just talk to myself or talk to the wall.

Justin: What inspired you to take what required tremendous self-discipline to learn a foreign language independently?

Dr. Wang: I just really wanted to see a different part of the world, and I thought if I wanted to come to the United States, I'd have to learn English. I didn't want to be here and then not know.

Justin: Then when did you eventually come to the United States?

Dr. Wang: I came here for college. When I was in high school, I had an opportunity to become an exchange student at that time, but I was not selected. It was actually a very much of a shock to me and probably changed my life at that point. It was supposed to be a very fair selection, and it turns out it wasn't. It turns out that you had to know someone to be able to be selected, and I didn't know that.

Justin: You probably spoke English better than any of your competitors?

Dr. Wang: I spoke English better than anybody else in the entire country in my age-group at that point. They told me that I was not a very good listener. That was their excuse, that I was not a very good listener, when in fact it's because my parents were not important or famous or had money.

Justin: Rude introduction to the real world.

Dr. Wang: Yes, indeed. I was 16, and it was a very rude introduction. Then I decided if I wasn't going to become an exchange student, I wanted to come here for college. Then I applied and got in. I got into Grinnell College in Iowa, which is a liberal arts college.

Justin: How'd you pick that one?

Dr. Wang: Grinnell actually had an exchange program with Nanjing University, and I was taking classes at the university at that time, and I met some students from Grinnell, and I thought that was pretty cool. I had never heard of Grinnell before.

Justin: Had you heard of Iowa before?

Dr. Wang: No.

Justin: It's not exactly a standard American destination.

Dr. Wang: No. I had never heard of Iowa before.

Justin: What was it like going from Nanjing to Iowa.

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Dr. Wang: It was a huge shock. Yes, it was a huge shock. I remember the day I landed in Des Moines, I was picked up by a school van. We stopped on our way from Des Moines to Grinnell at a gas station. That was my first night in the United States. The driver said, are you guys thirsty? I said, yes. He bought me this 36-ounce giant drink that was mostly full of ice. It tasted so artificial. I had never tasted anything like that before, and I was falling asleep in the van as I was holding this giant mug with ice slushing around.

Justin: Was it a van full of exchange students all from China or from all over?

Dr. Wang: From all over. Back then, it wasn't very common for students from China to attend colleges in the US. Now it's everywhere. Back then, we had about five or six on the entire campus of Grinnell for students from China. Now it's, I don't know, 30 a year.

Justin: What was it like being an undergraduate in the United States?

Dr. Wang: It was very different from what I would have experienced it in China. You had a lot of freedom to choose what you wanted to do and really didn't have to decide your major until after a second year of college. I got time to explore a lot of things. I learned German. I ended up studying in Berlin for a whole semester during my third year of college. I took a lot of classes. Eventually I decided to major in biology, but it took a very long time for me to decide, and I was able to explore. I took classes in ancient Greek history, I took classes in anthropology, I took classes in economics. It was a great experience

Justin: What was dorm life like in the United States compared to what you might've experienced in China?

Dr. Wang: Oh, very different. My first year my dorm was coed, so we had this really sketchy guy who was essentially my neighbor who would come over and borrow things all the time. I got along with my roommate really well, and we became really close friends.

Justin: At what point did you know you wanted to be a doctor?

Dr. Wang: That's a very good question. I don't even remember the exact time. There wasn't really a moment when I thought, "Oh, I'm going to become a doctor." When I was growing up, I was exposed to medicine because my mother was a hematologist at that time. Then she changed careers and eventually became a lawyer. My mother is a very legendary person. She's about a hundred times smarter than me. Just as determined. I am like her, except not as smart as her, so yes, she was a doctor when I was growing up. She was a hematologist, so I was exposed to the microscope even when I was very little. I knew all of her colleagues, and I spent a lot of time in the hospital. I was exposed to medicine, but then she changed careers because her eyesight got really bad, so she couldn't go on anymore. She decided to become a lawyer instead.

Then I had this long period of time when I wasn't really exposed to medicine anymore, and I wasn't really sure what I wanted to do. In college I spent a lot of time

doing science and I spent most of my time doing research with Professor Kenneth Christiansen who was the world's foremost expert on a very small thing called Collembola

Justin: How do you spell that?

Dr. Wang: C-O-L-L-E-M-B-O-L-A, Collembola, which was a type of insect (they are no longer considered insects, but most people still think they are). That's all he studied. He spent his entire life collecting them from all over the world, including in Nanjing, I found out later. These are tiny things, and you have to look at them under a microscope. I spent a lot of time identifying them. I ended up discovering five new species.

Justin: Do any have your name?

Dr. Wang: No, he said I could either publish a paper or have my name attached to it, and I thought I should get a paper. Now thinking of it, I probably should have had my name. I spent a lot of time under the microscope looking at things, and I was really interested in science. I thought I was going to go to graduate school. I wasn't sure I could do medicine, because at that time a lot of people told me that "you're an international student, it's almost impossible to get into medical school." My parents didn't have a lot of money. I went to college on a scholarship, so if I didn't get a scholarship, I wouldn't have been able to go to medical school. I wasn't sure I even wanted to go.

Justin: Is it pretty common for physicians in China not to have a significant amount of financial resources, because in the United States, we think of doctors as fairly well off.

Dr. Wang: Yes. It's very common actually. Doctors are not paid a ton in China. The pay has gotten a lot better in recent years, but even 10 years ago people were not paid very well. That's why you hear stories of people getting bribed, because they were paid very little.

Justin: Thank you.

Dr. Wang: So I just didn't know what I wanted to do for a very long time in college. I eventually decided probably towards the end of my third year in college that I wanted to do medicine. At the same time, I wasn't sure if I wanted to do an MD / PhD or I wanted to do an MD only. I went to medical school thinking I wanted to do an MD PhD.

Justin: Then what led you to do just the MD?

Dr. Wang: It's actually because the person I was going to work with left. Then I ended up just getting an MD.

Justin: What was it like applying to med school as an international student?

Dr. Wang: It was very difficult. I would not have gotten into Duke, because Duke requires that you pay upfront your four years of tuition. You have to have financial

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proof that you can afford over a quarter-million dollars. You have to show them your bank account to be able to apply.

Justin: As a medical student?

Dr. Wang: As a medical student. Yes. A lot of schools were like that. All the state schools will not accept international students. I got really lucky that I got to Dartmouth and actually got a scholarship from them.

Justin: What was medical school like?

Dr. Wang: Medical school was great. I had a really great time. I think people make their own experiences, and I decided that I wanted to experience medicine early. I wanted to decide what I wanted to do early. My way of deciding was ruling things out. The first thing I tried to rule out was surgery, actually, because I spent a lot of time doing research in college, and I thought surgery would be very far from a research-oriented career. I decided to email the head of cardiothoracic surgery, the division chief at Dartmouth and I said, "I don't think I'm going to do surgery. I just wanted to see what it is like before I completely rule it out." He said, "Well, why don't you scrub in the OR with me tomorrow."

I was a first-year medical student, in the spring of my first year of medical school, and so I did. Then I totally loved it, and I thought after the first day, "Wow, this is really a completely different experience." I said, "Can I come back tomorrow?" He's like, "Sure." Then I ended up just shadowing him for most of my medical school time. I stopped going to class. Our classes at that point were taped, and you could watch them online. I would watch them at night after I spent the whole day in the operating room.

Justin: Who was he?

Dr. Wang: Dr. Bill Nugent. He's retired now.

Justin: Have you kept in touch with him?

Dr. Wang: Yes.

Justin: He must be pretty excited to see how your career has unfolded from somebody who never wanted to do surgery.

Dr. Wang: Yes, indeed. He's very, very excited that I've decided to go into cardiothoracic surgery.

Justin: What was your surgery clerkship like in your third year?

Dr. Wang: My surgery clerkship wasn't all that different, really, from all the time I spent at the hospital. At that point, I had already decided I wanted to do cardiothoracic surgery. I was fairly focused, and I had a great time.

Justin: What year did you graduate from medical school?

Dr. Wang: 2011.

Justin: Any great mentors aside from Dr. Nugent?

Dr. Wang: In the summer of my first year of medical school, I did a summer scholars program at MGH, and there I was shadowing in cardiac surgery and thoracic surgery. Then I did some research as well, so one of my mentors was Dr. Henning Gaissert.

Justin: How do you spell his name?

Dr. Wang: H-E-N-N-I-N-G G-A-I-S-S-E-R-T. He's German. Actually, we spoke German together. It was great. He's a great mentor. He's been a great mentor, and I've kept in touch with him as well. Then the second summer, as in summer of my second year of medical school, I spent at Memorial Sloan Kettering with Dr. Valerie Rusch, who is one of the most prominent thoracic surgeons in the world.

Justin: How do you spell her name?

Dr. Wang: Valerie, V-A-L-E-R-I-E, and Rusch, R-U-S-C-H. She really took me under her wing. During the whole summer, I scrubbed in a ton of cases with her. She would say, "Well, you're a second-year medical student now. You should be able to do a thoracotomy on your own." Then because there were so many cases going on, some of them didn't have fellows or only had a resident, she would let me actually do a thoracotomy with her. I had a great time.

Justin: That's remarkable.

Dr. Wang: It was really remarkable, and she was one who'd really stressed the importance of science and said most people think that surgeons don't do science, but she's the one who actually established all the guidelines, did a lot of the randomized trials and really was pushing for more science in surgery.

Justin: When you were applying to residency, were there 16 cardiothoracic programs available?

Dr. Wang: Yes. There were about 10 programs available. I interviewed at six of them, but I was not impressed with a lot of them because, at that time, no program had actually graduated anyone yet. So they were an unknown entity. The places I interviewed at, I wasn't sure that they had a plan for me. Plus, I really wanted to do research, and a lot of them were not sure that they would allow that for integrated residents.

Justin: How'd you end up at Duke for your residency?

Dr. Wang: Again, it's complete serendipity, like many things that happened in my life. I happen to know this cardiothoracic surgery fellow named Joe Turek, who is now on faculty at Duke. He had gone to Duke. He was doing his congenital heart surgery fellowship at CHOP. During my fourth year, I did an elective at CHOP.

Justin: In pediatric surgery?

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Dr. Wang: In pediatric surgery. Well, I actually went to Penn for an elective in cardiac surgery, and then I heard they also offered an elective in pediatric cardiac surgery. I had never seen it before, so I decided why not. I decided to stay an extra month and did that elective. That's when I met Joe Turek, and I told him I was applying to surgery. He said, "You should check out Duke. I'm going to send an email to Dr D'Amico for you." He did. Then I got an email from Dr D'Amico saying, "We're interested in you. Why don't you apply to Duke?"

Justin: What was Duke's reputation at this time when you were applying?

Dr. Wang: Very malignant. My mentors at Dartmouth told me that they would chew me up and spit me out. Those were their exact words.

Justin: This program has this terrible reputation and yet you end up here for your training. How'd you end up here?

Dr. Wang: I interviewed here. I actually enjoyed my interview, and then I talked to Dr. D'Amico, and he said, "We're going to make you a cardiothoracic surgeon." He said, "I am committed to making you a cardiothoracic surgeon. You have a spot here."

Justin: You ended up ranking Duke pretty highly?

Dr. Wang: Yes. I decided to take a leap of faith.

Justin: You got here in what year?

Dr. Wang: In 2011.

Justin: Who was in your intern class that year?

Dr. Wang: My intern class, everybody except for Jeff Keenan wanted to do cardiothoracic surgery. My intern class was Cameron McCoy, who want to do thoracic at that time. Jeff Yang, who wanted to do thoracic. Brian Gulack wanted to do thoracic. Danny Nussbaum who wanted to become a cardiac surgeon. It was me, and then Emma Neff, who later left. Then Jeff Keenan, who wanted to do trauma at that time.

Justin: Who was the chair and who was the program director when you started?

Dr. Wang: The chair was Danny Jacobs, but I probably saw him once. The program director was Brian Clary, who is now the chair at UCSD.

Justin: What was intern year like for you?

Dr. Wang: Intern year was hard. I wanted to quit every single day. Every single day I woke up thinking, "Should I actually go in, or should I just quit today?" Well, I started on thoracic surgery on nights on July 1st. I had nine nights in a row. Back then they were just starting to ban more than six nights in a row, but we somehow ignored that completely. I had nine nights in a row on thoracic when we still covered cardiac patients. On my first night, my first page was somebody's power was surging on the

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LVAD, and I actually went and found the LVAD manual so that I could read about what it meant, because the fellows were not going to help me. In fact, I had Mani Daneshmand, and he came by, and I said, "I have some questions. It's my first night. I don't even know what I'm doing here." He's like, "You need help? Well, go in the bathroom and look in the mirror. That's your help." He walked off.

Justin: You're now in a chief position where you're supervising interns. How has the intern experience changed over the last several years?

Dr. Wang: I hope that people think that it's completely changed, and people get so much more direction and supervision now. I have not had a single time when I turned away an intern who asked for help.

Justin: Any fun stories from intern year?

Dr. Wang: There were so many fun stories of my co-interns, we were really a very close-knit group. The story of Danny Nussbaum stabbing himself with a scalpel during our first month or Brian Gulack telling Dr. Georgiade how easy breast surgery is, and Dr. Georgiade handed him the bovie, and Gulack could not go on for more than 30 seconds.

Justin: I hadn't heard that story.

Dr. Wang: Brian Gulack was helping Georgiade and said, "Oh, that looks really easy." Georgiade was like, "You think so? Here's a bovie, see how far you can go." He lasted about 30 seconds.

Justin: Typical Gulack.

Dr. Wang: Then Danny got sick from the cafeteria, and had to get an IV.

Justin: While he was still working?

Dr. Wang: While he was still working. Yes. Exactly.

Justin: Wouldn't want to take a day off for throwing up?

Dr. Wang: No. You were not allowed to get sick, and you were not allowed to take any time off. In fact, it was completely looked down upon. You were not allowed to really make any decisions either. That's the part I hated the most – that you were not allowed to think. The chief told me that as an intern, you are the great shit deflector. That was your job, to deflect shit that would otherwise fall on them. That was my job and my job was to not have any independent thought, to just completely execute everything they told me. They said we don't want an intern that has a brain, it doesn't help us that you have a brain.

Justin: Just a sharp pencil.

Dr. Wang: Yes. Exactly.

Justin: Was JAR year any different?

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Dr. Wang: JAR year was a little bit different. I liked JAR year a lot more. I started at the Durham VA, and it was a completely different relationship with the chief than as an intern. Because as an intern, you were just told what to do, but as a JAR, you actually take consults, you talk to the chief about the problems, you organize the entire VA schedule. Back then we called patients every night to tell them to come to their surgery, so you felt like you had a better control of your schedule. You had a better idea of what you're doing, so it was a much better experience for me.

Justin: Any good stories from JAR year?

Dr. Wang: I'm trying to think. There are so many good stories. Back then, the chiefs were still operating on their own at the VA. You would do cases with the chief or sometimes with SIG [Dr. Seigler], you would operate with the SAR-1 and SIG would not be in the room. The SAR-1 who's fresh out of the lab, who had no idea what they were doing, and you had no idea what you were doing and you're fixing this hernia. There was definitely a hernia that I don't think actually got fixed. He either didn't have a hernia, or we never dissected down to the hernia sac. There were definitely cases like that or cases you operated with SIG and he's yelling at you the whole time and he couldn't wait to clean up the OR. You were still sewing up and he's already dusting off the floor.

Justin: Different days.

Dr. Wang: Completely different days. The best line from SIG I had was at the end of my two months with him. I wasn't sure if he liked me or not, and I had heard that he didn't like women; people would say that he didn't. I wasn't sure if he liked me or not. He had one question for me. He said, "Who's coming next?" I said, "Danny Nussbaum." He was like, "Oh God, I am going down the food chain here!" I guess he liked me, and that's his way of saying it.

Justin: Quite the compliment from Dr. Seigler. Then you end up going to the lab for a prolonged period of time. Did you anticipate getting your PhD right out of JAR year, or is that something that developed while you were in the laboratory?

Dr. Wang: I did decide to do the PhD before I started. It was during my intern year actually; I remember that distinctively. It was one day when we were talking about what we're going to do for our research, and back then there was no structure and there was no "have a plan and present to Dr. Harpole." Back then it was all you. You just showed up to the lab. The department paid for you fortunately, for whatever you wanted to do. You didn't have to have a plan. I was trying to develop a plan. I was talking to Jeff Yang about this, and he said, "What do you want to do?" I said, "I really wanted to do a PhD before. I still think I might want to do it, but I'm just getting so depressed as an intern, I just don't even have the energy to apply."

Because that means I have to dig out everything I did before. Write up an application, take the GRE again, which I took back in high school to apply to college, because back then you couldn't do SATs in China. So, I decided to take the GRE as a substitute for SATs in high school. I said that I had to retake the GRE as scores had expired. It was just too much work as an intern when I was barely hanging on, and Jeff Yang said, "I think you should do it." He was so encouraging, and he said,

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"You're going to be the one who's doing a PhD out of all of us, and you should really do it." Then I got encouragement and decided to apply.

Justin: You applied to the graduate school separately?

Dr. Wang: Separately. Yes.

Justin: What did you want to do your PhD in?

Dr. Wang: Even back in college, I wanted to do bioinformatics. Even though I eventually majored in biology, I wanted to actually do an independent major in bioinformatics, which was not approved. I ended up just doing biology but took a lot of math and computer science classes. That's always what I wanted to do. In fact, as a backup plan for medical school, I applied to graduate school at the same time in college, and I got into the same program actually at Duke in bioinformatics, and I was going to work with the same people that I ended up working with seven years later.

Justin: Did they recognize you?

Dr. Wang: Yes. They did.

Justin: Was that to your advantage? Like, "Welcome back," or was that, "Why didn't you come to us seven years ago?"

Dr. Wang: They were actually very welcoming.

Justin: That's good. How did the department of surgery react to you saying, "Hey, I want to spend X number of years getting a PhD in bioinformatics in the graduate school?"

Dr. Wang: Dr. [John] Migaly was supportive. He was just confused, because he thought...he told me, "I thought you were going to do real science with test tubes and stuff. I didn't realize you were going to do some fake science." I don't think he knew what bioinformatics was.

Justin: He had since become program director?

Dr. Wang: Yes. He said, "I'm really confused here. I thought you were going to do some real science." Then Dr. Pappas was the interim chair at that time. We didn't have a chair, because Dr. Jacobs left. I was talking to Dr Pappas, and he was very supportive.

Justin: Who was going to pay for this PhD?

Dr. Wang: My first two years were going to be paid for by the surgery department. Then my last two years was going to be paid for by my PI.

Justin: Got it. Well, grad students' salaries tend to be less than surgery residents' salaries. Do you have to take a hit in your salary to finish your PhD?

Dr. Wang: I ended up getting on a T32, so they paid me for my PGY year. It wasn't that bad as it would have been if you were a pure graduate student.

Justin: What was it like going to graduate school after two years of being in one of the harder surgery residency programs in the country?

Dr. Wang: It was very different. It was completely different. As a graduate student, the first year it was mostly classwork. I went back to school, sat in an algorithms class with all computer science PhDs. I thought I was the dumbest person in the class, and I did not understand anything about what they were talking. Then some of the homework assignments, I remember spending 30 hours on one algorithms assignment, because I just couldn't get it to work. Then I realized all my classmates also spent at least 10, 15 hours, so that made me feel better. It was a lot of work. I spent a whole semester with the math department learning all that modeling and everything else. It was very different from surgery residency.

Justin: What were your qualification exams like?

Dr. Wang: My qualification exam was, I had to come up with a grant style application. Then I had to defend what I was going to do, and what resources I had. It wasn't really a written exam, it was more of a presentation style.

Justin: Did you get along pretty well with your graduate student classmates, coming from such diverse backgrounds?

Dr. Wang: Yes, I did, and I really enjoyed having a completely different group of friends. They were more concerned about how to solve the next problem than anything else in the world, really.

Justin: It's a different attitude.

Dr. Wang: It's a completely different attitude. Yes.

Justin: With whom did you work for your dissertation?

Dr. Wang: My dissertation advisor was a Svati Shah. She's actually a cardiologist. She's a clinical cardiologist. When she was hired, she spent 75% of the time in research, and now she's almost 100% research. She had a lab with both bench science people and computational people as well.

Justin: On what did your project focus?

Dr. Wang: My own project was looking at metabolomics, and to identify biomarkers that can help us risk stratify ischemic heart disease. The first step of my project was trying to improve the technology we had in metabolomics, using mass spec. It was mostly biophysics type of work. I spend a lot of time at the core mass spec laboratory at Duke, which is in the DMPI, the Duke Molecular Physiology Institute. I spend a lot of time running samples and learning how to use the mass spec machine. I offered to clean the machine for them, so then they could actually teach me how to assemble everything. I learned to assemble the machine, I learned to run the samples, I learned to tweak the machine, and then, I also learned to analyze the

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spectrum, which ended up being the second aim of my project – using computational methods to improve compound identification. Then the last part of my project was using the technologies I helped develop and the protocols I helped develop to actually study a cohort of patients.

Justin: Was that successful?

Dr. Wang: Yes, it was successful. One of the projects that came out was published in JAMA Cardiology.

Justin: That's pretty awesome. Good for you. Then, how do you see that research evolving in a future career as a surgeon?

Dr. Wang: Even when I was in the lab, I had started doing some work, collecting samples with Dr. [Chad] Hughes. I did some clinical projects with him, and I was collecting samples from patients who had aortic aneurysms, because that was what I was interested in. Then, I got a grant, the TSFRE grant, the Thoracic Surgery Foundation Research and Education Grant. It's the Braunwald scholarship. It was a two-year fellowship, scholarship that I got, that I could use towards the project. I was looking at biomarkers for thoracic aortic aneurysms. I was using some of the similar things that I had used, and the technologies that I helped develop to study that.

Justin: When you were on the interview trail for Cardiac Surgery, how did programs and faculty members respond to someone who's coming in with a PhD in a relatively unusual field? Because obviously you'd been successful in finishing projects and publishing them, but not in the standard database analysis or in test tube science.

Dr. Wang: People responded really well. People are realizing the need for the skills I had. It wasn't just specific to the project I did, but also being able to carry out a project independently and having these analytical skills. People responded mostly positively.

Justin: Did people even understand what you were talking about?

Dr. Wang: Most of them did not, and they admitted it. They said, I have no idea what you're talking about, but the things that you did sounded really cool.

Justin: [laughs] Do you envision being able to continue both in a career?

Dr. Wang: Yes.

Justin: You head to Hopkins next year, do you think that they have room for you to do both, or are you going to take a pause during fellowship to finish the clinical training, and then move back into the research realm.

Dr. Wang: I'm hoping that I'll be able to, at least, do some of the work while in training, and I've talked to Jennifer Lawton, who is the division Chief for Cardiac Surgery who recruited me to Hopkins. She also said that they have a plan that they can help me get started, even during fellowship. That's my hope.

Justin: That's exciting. You did four years in the lab, got a PhD, came back as a clinical third year to a completely new cohort.

Dr. Wang: Yes.

Justin: What was it like in watching your intern cohort move on to be chiefs, while you're stuck still as a third-year resident?

Dr. Wang: Yes. You know, Alice [Wang] was my sub-I. Jeff [Sun] and Jim [Meza] were my interns, when I was at JAR, and some of the Chiefs who graduated last year were my interns as well. Yes, it was very different. The program was also completely different. We had Dr. Kirk, who came in during my time in the lab. Dr. Migaly officially became program director. It was a completely different feeling. In fact, some of the residents, -- I'm not afraid to say names -- Ehsan [Benrashid], said "You know with the interns, everything is so different now. After we came back from the lab now shit rolls up hill." Those were his exact words. [laughs]

He was right. Things were very different, I think the way we treated junior residents was different, and people were no longer just order-entering machines. Junior residents were encouraged in the operating room, instead of kept away from the operating room. I remember being an intern and being told that a good intern stays on the floor. A good intern should never be seen in the OR because they should be taking care of stuff on the floor. Now, we encourage the interns to go to the operating room as much as they can, and people enjoy a lot more independence and encouragement.

Justin: SAR 1 year you went to Raleigh.

Dr. Wang: Yes.

Justin: Had you gone to Raleigh as an intern?

Dr. Wang: No.

Justin: What's your Raleigh experience like?

Dr. Wang: Raleigh was great, you get fed every day. [laughs] It was also my first exposure to people in private practice. I had never imagined anyone could do a lap chole in six minutes or during the time the medical students are sewing up the port sites, and Dr. [Chris] Watters has done another lap chole.

Justin: Completely different mentality.

Dr. Wang: Completely different mentality, Yes.

Justin: You ended up progressing to SAR -2 year, any particular good stories from SAR two year?

Dr. Wang: There are many good stories. I spent a lot of time on vascular surgery. As a SAR-2, I spent three and a half months on vascular. I requested it, because I wanted to improve my skills. Coming back for my SAR-1 year, I wasn't sure I was

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ready really, because at that time, you are expected to start functioning as a senior resident, but I don't think I had any operative skills, because I spent very little time in the OR as a junior resident. Now, all of a sudden, I was asked to perform at a much higher level. I wasn't really very comfortable in the OR, in the beginning of my SAR one year.

When I got to SAR two year, I really wanted extra practice, and vascular surgery was great, and I really enjoyed working with all of the surgeons. Dr Cox was especially wonderful. I remember a case we did; it was a case I ended up presenting at M&M. The case where the patient had a groin hematoma after an A-line removal on the cardiology service. Unfortunately, by the time we got to her, it was too late. When we got in, and it was still bleeding, Dr Cox handed me the castro and said, "This is a bleed and sew situation, now have at it."

Justin: And it worked?

Dr. Wang: It worked. [chuckles]

Justin: Good. Then you started interviewing as a SAR 2. What was the interview trail like?

Dr. Wang: I really enjoyed the interview trail. Almost everywhere I went, people were really, really, impressed with what I had done. I think that Duke really carries its reputation very well. People knew that I had great training at Duke. Their only concern was that I was not going to leave Duke. Most people were sure I was going to stay at Duke.

Justin: Duke does have a great cardiothoracic training program and has an expedited pathway. Did you consider either of those options?

Dr. Wang: When I came here, I thought I was going to do the JTP [Joint Training Program]¹ for sure, when I interviewed with Dr. D'Amico as a medical student. Then when I came out of the lab, I was less sure because I just didn't feel comfortable, really. It was more because of my discomfort in the OR, I would say, that deterred me from applying for the JTP. I thought I may need more training in general surgery just because my junior years were spent outside the OR, mostly. Then I had such a long period of time when I didn't do anything clinical. It was mostly because of me that I didn't apply to the JTP.

Then when I got to SAR 2 year, I think I just wanted to do something different. I felt that I would spend nine years in Duke, and maybe it's time to move on to something different.

Justin: How did you pick Hopkins?

Dr. Wang: I really enjoyed my visit there. Again, I had never visited Hopkins before. Hamza [Aziz] is there. He really enjoyed his experience. Talking to the faculty there,

¹ An expedited 4-3 pathway for those interested in cardiothoracic surgery.
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a lot of them were quite young and very energetic, and they were all interested in my research and in supporting me.

Justin: That's exciting. It was near the top of your list?

Dr. Wang: Yes.

Justin: That's terrific, and now you are a chief, it's got to be a little different being on the top of the totem pole?

Dr. Wang: It's completely different, yes.

Justin: Your chief class, and you, in particular, have developed a reputation for trying to solve some of the problems at Duke Surgery, which our junior residents think is terrific. Can you describe a little bit about your efforts in that regard?

Dr. Wang: Yes. There's a quote I read when I was in research. This is a quote from *A Hundred Years of Solitude*. It says, "What worries me most...is that out of so much hatred for—" Well, in this case, it was the military- "out of fighting them so much and thinking about them so much, you've ended up as bad as they are, and no ideal in life is worth that much baseness." That was a quote I decided to live by as I became a senior resident. I did not want things to be the same. I did not want to become a chief that I hated so much when I was a junior resident. I just wanted to make sure that people actually felt that we cared about them.

Justin: What are some of the specific initiatives that you and your class have pioneered to improve residency at Duke?

Dr. Wang: Some of the things we started with was making sure that everyone had an opportunity to have some flexibility in arranging their schedule. I knew at the end of last year, people were just told what their schedule was.

Justin: You mean for the year or for the month or both?

Dr. Wang: For both, and what rotations they wanted to do. People were given more flexibility in what they wanted to focus on. Then also in the month to month schedule, people could say, "I have an event that I want to go to, and I want to switch this shift with somebody." I don't see the problem in switching with people, as long as people want to switch. What's the problem? Before this, it was like, "You can't." I don't know why. It just seemed unreasonable.

Then we moved the chief's conference to Monday instead of Friday so that people could get out earlier if they wanted to, on Fridays. Some of the other things we did: I helped install all the hooks in the bunker and really changing the bunker and the new furniture in the bunker. I finally got rid of the couch that the Lunz [Keri Lunsford] was lying on.

Justin: Still had her Cheetos in that?

Dr. Wang: That's right. Definitely, it had all the nachos and everything in there.

Justin: So major quality of life initiatives.

Dr. Wang: Yes, and then tackling the Trauma / ACS [Acute Care Surgery] Service, which is still an ongoing project, and making sure that people's voices were heard.

Justin: What were some of the challenges that residents saw in the ACS / Trauma Service that you guys worked to ameliorate?

Dr. Wang: A lot of the challenges were really not knowing who to go to when you have a problem, and there were challenges with attending responsiveness. There were challenges regarding the APPs and the division of labor that we spent a long time working on, and making sure that the interns or the physicians are in control of their schedule, and of the service. Sometimes I think when the APPs have been there for a long time, they consider themselves in charge and start making schedules and assigning things. We want to make sure that physician assistants are there to assist physicians, instead of the other way around, and the interns should be empowered to take control.

Justin: Has that been met with a positive reception from the leadership?

Dr. Wang: Well, in some ways. I think the leadership support us, but on specific things, getting specific things done, there's always difficulty. It's very hard to change culture. We're talking about changing the culture of a whole department

Justin: A whole field.

Dr. Wang: Yes, and it was very difficult. Dr. [Cynthia] Shortell has been instrumental, both Dr. Kirk and Dr. Shortell, especially for the specific things and specific points that we raised, and we've been able to work with Dr. Shortell.

Justin: That's terrific. Those are some of the changes that you've seen in the nine years you've been at Duke Surgery. What are some of the other changes that you've seen the program go through and how it has evolved?

Dr. Wang: I think the relationship between residents has really changed. I would not imagine being invited to my chief's house ever, in any way, shape, or form, when I was an intern. You work with them at work, and that was it. Your relationship ended there. Now, I see people go to each other's houses. I established this family meals group. There's probably 20 or 30 residents on that conservation thread now. We would go to different places to have dinners. Before COVID happened, I remember we had our last dinner back in February. That was the last one we had. We would go out and find a different restaurant every other week, actually.

I invited 30 residents to my house last year for Thanksgiving, about 20 people showed up.

Justin: That's pretty amazing. You mentioned COVID, that's obviously had a significant impact on the whole world. How has it affected your experience as a chief resident at Duke Surgery?

Dr. Wang: It's been completely different for the last few months, really. Fortunately, I think we had a somewhat quick response in changing the residents' work schedule. We came up with a platoon system trying to minimize exposure for the residents.

There's a lot fewer [surgical] cases now, and fortunately, we've all met our operative volumes. I actually met all of them last year, all except for the chief level cases. There was a lot of uncertainty about the schedule, and about where people needed to be.

Justin: Do you think it was handled reasonably well, or reasonably poorly by Duke?

Dr. Wang: I think it was handled reasonably well. There are definitely things that we could improve, for example, finding a PAPR for the OR is a problem we just encountered a couple of days ago.

Justin: Any particularly influential mentors in your time at Duke Surgery?

Dr. Wang: Yes, a lot of them, now I think of them. Dr. Cox, as I mentioned, was especially helpful in helping me not just learn the cases but have the confidence to actually do the case. I think he gives the residents a lot more autonomy than some of the other attending do. I've definitely had residents complain to me that, "You are not really progressing in your level of skills. You are just continuing in more difficult cases. You're still the person to bovie. You've just moved on from bovieng in a breast case to a pancreas case, but you're still not doing the dissection." Dr. Cox really was the one who allowed me to do the dissection and to really improve my skills to the next level.

Dr. [Ellen] Dillavou was also a great mentor for me. She helped me during my most difficult time when I came back from the lab as a SAR 1 and she was really the one to push me to become more comfortable and to really think about the cases, not just from the sewing or anastomosis standpoint, but from how do you achieve the exposure? How do you even set up the operating room to get to that point? I started paying more attention to that aspect. How do you even position the patient? It's very important, actually. If you can do a case with Dr. [Peter] Allen, you'll see the positioning is very important.

Then, Dr. [Richard] McCann. This year has been, I think, the best year for my time here. Dr. McCann was a great mentor in letting me do things and helping me improve and then pointing out the tiniest detail that's going to improve a case. I would write down everything he says, because he doesn't say very many words. During a case, when he says something, you know it's very important. He says, "How do you load a needle holder for example when you're doing part of the anastomosis?" He says, "When you are in a corner, you have to change where you load the needle holder, so that way, it really improves how you drive through the tissue." Things like that. Very tiny things that make a big difference.

Or the way you hold a vessel to help you do the anastomosis, which direction you're holding it without obstructing yourself. Things like that. The things that you would never learn on your own, but when it's pointed out to you, you realize it's so obvious, and it helps you tremendously, and if he doesn't say it, you're not going to know it. I

think I even created a whole list of Dr. McCann quotes that I was going to show at my chief's dinner.

Dr. [Tom] Novick has been great in sometimes letting you struggle a little bit. I've heard residents say, "Operating with Dr. Novick takes a very long time." It takes a very long time because he lets you struggle. He doesn't just take over when it's hard. He lets you struggle through and realize that operations look easy because the attending's helped you look good. It's not because you're really good. It's because they helped you set it up completely. Dr. Novick, he will tell you and he'll say, "This case, I'm not going to help you. You're on your own. We'll see how far you get." It becomes a huge struggle but then you actually realize what it takes to get there.

My entire time at the VA was a great experience. Then these last few months I've been with Dr. [Peter] Allen, and that's just another great experience I've never had. You realize the difference between someone who can do a two-hour Whipple versus a nine-hour Whipple, and it's huge. It's not because he moves faster, it's because he knows exactly where to go. He puts on his Bookwalter before he makes an incision. The Bookwalter post is already there, so you don't have to struggle to get the Bookwalter in and get everything in. He knows exactly where everything is.

You can predict how many moves he's going to make. Every single move achieves something, as opposed to going here a little bit and going there a little bit, struggle then wait, make sure the bleeding is under control. His operations do not bleed. His blood loss is 20 cc for a Whipple. Why can he do that? Because he knows exactly where to go. He will tell you, he does not take the gastroepiploic vein before he develops the tunnel completely and before he transects the pancreas because there are branches there.

If you try to take it before you have complete visualization, you get into bleeding and that's what slows you down. He knows exactly which artery is behind which vein. Then when he gets there, he's not afraid. Even when there's bleeding, he's not afraid. He knows exactly how it's going to end, and it's going to end in two hours. Even with a chief resident who's never done the case before.

Justin: It's pretty remarkable.

Dr. Wang: It is really, truly remarkable. He'll tell you. He says, "There's a manic and depressed phase of every operation." He'll say, "We're in the manic phase. Why are you slowing down?"

Justin: It's a good line.

Dr. Wang: It is a great line.

Justin: Obviously, you've had an enjoyable time at Duke, by and large, over the time. No program was perfect. If you had a magic wand and could fix some things about Duke Surgery, what would you fix?

Dr. Wang: I think I would definitely fix my junior years. I think it was a very difficult time. I know Emma decided to leave the program, and I think it's probably because of some of the things that happened. The sense of despair at that point was an

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everyday phenomenon. I would definitely fix that. I think, nowadays, the junior years have gotten a lot better for the residents.

Justin: They may not realize that.

Dr. Wang: [laughs] I've had interns tell me they're getting really depressed and wanting to quit. I thought, if only you had the intern year I had - I wanted to quit in July! I wanted to quit my first night! I went home and cried and told my mother I was going to quit.

I think we ask a lot of the residents in this program. I wish sometimes we would ask as much of the attendings. I think we hold residents to very high standards. I think it's great, but I think we should also hold other people to the same standards. The APPs should be held to the same standards. If you're doing an intern's job, then you should actually have the same responsibility, have the same hours and do the same things.

I think some of the attendings need to be more engaged. Some of the attendings need to be more present and more responsible instead. I noticed in the past months at some of the M&Ms, we've really shifted the blame on the residents, and I was not happy to see that. Residents were blamed for things that they had no control of such as disagreement with an attending. That was an incident that we talked extensively during our meeting with Dr. Kirk afterwards. The whole class brought up the fact that it's very hard for a resident to go against an attending because of the power dynamics, and you have to work with them again, it's not like you're never going to see them again.

To say that, "If you have a disagreement, just go ahead and call another attending." That's pretty easy. That's very easy for the chief of surgery to say. It's not so easy for the fourth-year resident to do.

Justin: Anything else you wanted to put on the record about your time at Duke Surgery?

Dr. Wang: I'm trying to think. I realized, my husband reminded me, that I have seen 15 classes of residents during my time here. It's really remarkable how some of the residents I saw have become attendings. Dr. [Sabino] Zani was a first-year fellow when I was an intern. Kevin Shah wasn't even here yet when I was an intern.

Justin: Drew Barbas?

Dr. Wang: Drew Barbas was my transplant SAR when I was an intern. Lisa Tracy was my chief. I have seen so many classes of residents. [Michael] Lidsky was only two years ahead of me. This is why and how now he thinks he is a junior-

Justin: God?

Dr. Wang: -God. Yes, exactly. I want to keep reminding him, "You were only two years ahead of me. You were not that far advanced, and you did not round on your patients BID. I can tell you that." It's very different when someone becomes an attending. I think they suddenly forget what it's like in residency. There's a sense of

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disconnect that people develop after they become attendings. I think Drew Barbas has done the best of all of them. I think Kevin Sutherland also has done remarkably well.

Justin: Tracy has done pretty good job, too.

Dr. Wang: Yes, Tracy too. Tracy was a great chief to have at the VA. We struggled through a 10-hour case, a morbidly obese 600-pound person who had an enterocutaneous fistula and he developed even more enterocutaneous fistulae after the 10-hour case that no attending came to help with. Fortunately, that does not exist anymore. It's remarkable how-- I just think of the days I was in procto clinic and how many procto exams I did with no attending supervision whatsoever, and some of them had cancer. You had no idea if it was actually cancer or just something there.

Justin: Now the resident doesn't even get to do the procto exam because the attending does it. It's flipped completely the other way around.

Dr. Wang: It's completely the other way around. You never make a decision anymore. I don't know. I think it's probably safer for the patients, for sure. There were times when I did not feel comfortable as a JAR. That's a lot better now. I wish we had more of a structure when we were in research. It was mostly people doing their own things. There is a lot more structure now, even starting as an intern to get you started and help you get there.

I think we still need to teach the "how to do an operation" better. I know we developed the SAP and the app trying to get more feedback from the attendings. We need to actually build it on the resident and on the attending side. Residents should actually seek out feedback from the attendings, but also the attendings should really learn how to teach an operation. A lot of the attendings don't know how to teach an operation. Dr. Migaly would joke that, "How can someone do a two-hour Whipple and teach?" I can tell you that Dr. Allen teaches, and he's very good at that. That does not slow him down. Actually, by teaching you, he speeds it up, because the next time you do it with him, you know exactly what he's thinking.

He tells you exactly why he's doing something. He will tell you why I'm not dividing this vessel right now is because I don't have complete exposure, or why I am dissecting directly on the hepatic artery. It's because that's actually the safest thing to do instead of trying to avoid the artery. When you do that, you actually get in there. You get into the artery because you're avoiding it. If you dissect it right along the artery, you will not get in there because you know what you're doing. Things like that.

I wish a lot of the newer attendings, especially the younger attendings, would learn to be able to teach better and really help the residents and help themselves too.

Justin: This has been fascinating and revelatory. I appreciate you taking the time to chat with me. Anything else you wanted to add before we close?

Dr. Wang: I don't think so. Can you think of anything?

Justin: What was it like being married as a resident at Duke surgery? Where did you end up meeting your husband? How did that unfold?

Dr. Wang: Sure. We met in college, actually. We got married during residency. We had our wedding on New Year's Eve in 2014. A lot of my classmates came.

Justin: You were in the lab at that time?

Dr. Wang: Yes. I was in the lab at that time. My husband has been super supportive of my time here. In fact, he was the one who found my ATLS certificate when I was getting really depressed about whether I would be able to apply for the boards or not because the IT department lost my ATLS certificate. It's been great. He cooks most of the time. I've started cooking a little bit more during COVID, now that we have some time off. Most of the time, he cooks and he cleans and he makes sure everything is in order in the house.

Justin: Sounds terrific. All right. Thanks so much for your time, Dr. Wang. I really appreciate it.

Dr. Wang: Thank you.

[01:04:31] [END OF AUDIO]