ORAL HISTORY INTERVIEWS WITH NANCY ANDREWS
Duke University Libraries and Archives
Submitted January 24, 2019
Researcher: Joseph O'Connell

COLLECTION SUMMARY

This collection features an oral history I conducted with Nancy Andrews on January 8 and 10, 2019. Dr. Andrews stepped down from her decade-long role as Dean of the School of Medicine and Vice Chancellor for Academic Affairs in 2017. Our conversations explored the development of her interests and research as a physician-scientist, her formation as a leader and administrator at Harvard University, and her experience as Dean of the School of Medicine at Duke University. The themes of these interviews include women in science and medicine, advances in the science of iron diseases, and the lived experience of doing laboratory science.

This document contains the following:

- Short biography of Nancy Andrews (pg. 2-3)
- Timecoded topic logs of the interview recordings (pgs. 4-5)
- Transcripts of the interviews (pgs. 6-23, 24-43)

The materials I am submitting also include the following separate files:

- Audio files of the interviews*
- Scan of a signed consent form

*I recorded the interviews as a two-track recording, with one voice in the left and the other in the right. For production purposes, I recommend approaching each channel of this stereo recording as a single mono track.

BIOGRAPHY

By the time Nancy Andrews graduated from high school, she was already doing science in a university laboratory. 40 years later, her accomplishments included pioneering research on the science of iron disorders and serving as the first woman dean of a top-ten medical school. During her tenure as Dean of the School of Medicine and Vice Chancellor for Academic Affairs at Duke University, she drove decisions to build new facilities--notably the Mary Duke Biddle Trent Semans Center for Health Education—and to develop numerous new academic programs, partnerships, and resources, including the School's first Office for Diversity and Inclusion.

Andrews grew up in Syracuse, New York. She credits a high school teacher with fostering her love of science and helping get her started down the path of scientific research. "I had a chemistry teacher who took a special interest and encouraged me to apply for different kinds of summer opportunities," she recalls. Andrews gained admission to a summer program in marine biology in Cape Cod, Massachusetts. At the end of the summer, she brought back a newfound curiosity about the unique characteristics of blood in horseshoe crabs. She also brought back, in trash cans full of sea water, about 30 of the crabs. The budding researcher then linked up with a scientist at Syracuse University and got her first taste of life in a lab. With supervision, Andrews designed and conducted her own experiments to better understand the way the crabs' blood reacts to bacterial products.

During her undergraduate education at Yale University, Andrews gained further formative experience working in the lab of Dr. Joan Steitz, who was conducting high-profile research on RNA. The Steitz lab, which utilized biological samples from medical patients, opened Andrews's eyes to the synergistic possibilities of laboratory science and patient care. She set her course for an MD-PhD degree, and after graduating from Yale enrolled in a joint program at Harvard University and the Massachusetts Institute of Technology. Her training culminated in an internship and residency in pediatrics at Boston Children's Hospital and research and clinical fellowships at Harvard Medical School and the Dana-Farber Cancer Institute. She joined the faculty of Harvard Medical School as an Assistant Professor of Pediatrics in 1993.

Shortly after establishing her own lab, Andrews began working with a medical student with a shared interest in the science of iron. "We started out asking the question how iron gets in and out of human cells," she explains. "And after we had figured out answers there, we went on to asking how those processes of iron moving in and out of cells were affected in different diseases." Over the next 20 years, at Harvard and later at Duke, Andrews and her team would make key discoveries that gave physicians new tools for identifying iron diseases including hemochromatosis and iron-refractory iron deficiency anemia.

Beginning in 1996, Andrews received promotions into a series of administrative roles, culminating at Harvard Medical School in the position of Dean for Basic Sciences and Graduate Studies. As an administrator, she set out to address many of the shortcomings she had encountered during her own training. Her work included building recognition and resources for women in science and medicine and for MD-PhD students. She accepted the role of Dean of the School of Medicine at Duke University in 2007, where she found a younger, more pliable institution. Andrews shepherded the School through the financial downturn of the late 2000s, encouraging growth in facilities and faculty recruitment at a time when other academic medicine programs were scaling back.

While acting as Dean, Andrews maintained her passion for conducting scientific research. She moved her lab from Harvard to Duke and continued to break new ground in the understanding of iron disorders. Andrews attributes part of her commitment to laboratory research to the collaborative possibilities of lab settings. "The community in a lab is as intense and interesting a social environment as you'll find anywhere," she says.

Since stepping down from her roles as Dean and Vice Chancellor in 2017, Andrews has remained active in helping the School of Medicine evolve. She is currently the Nanaline H. Duke Professor of Pediatrics and a professor in the Department of Pharmacology and Cancer Biology. Beyond the walls of Duke, she serves on an array of academic, philanthropic, and pharmaceutical boards.

INTERVIEW TOPIC LOGS

Interview 1 (January 8, 2019)
File: 01.WAV

00:01 Introduction
00:47 Name, birthdate, and birthplace information
01:00 Current roles at Duke
03:00 Family background
06:07 Early interest in science
08:04 Opportunity to work on marine biology project in Cape Cod
09:05 Bringing horseshoe crab research to Syracuse University lab
12:35 Influence of supervising scientist at Syracuse University
14:07 Early impression of women in science
14:29 Connections between horseshoe crab project and subsequent work
14:52 Influence of educational film on interest in blood
16:55 Outcomes of horseshoe crab project
17:13 Undergraduate education at Yale
18:10 Involvement in laboratories
21:04 Working with Joan Steitz on RNA research
27:28 Difficulty of RNA and DNA sequencing technique at the time
32:56 Pursuing MD PhD at Harvard and MIT
34:47 Research projects on immunology and polio virus
36:15 Fellowship research on red blood cells
38:36 Influence of David Nathan, chair of pediatrics at Harvard medical school
43:28 Development of research on iron
45:52 Contributions of research to iron disease diagnosis
47:11 Administrative roles at Harvard
49:53 Motives for becoming administrator
52:15 Dean for Basic Science role
53:49 Reflections on what made administration a good fit

Interview 2 (January 10, 2019)
File: 02.WAV

00:00 Introduction
00:42 Transition to deanship at Duke
01:03 Impressions of Duke
04:38 Reasons for interest in the position
05:28 Experience of being appointed first woman dean of a top 10 medical school
07:44 Promoting inclusion and diversity
08:47 Organizing meetings of women faculty
10:01 Characterization of disadvantages of women in science and medicine
12:21 Correcting salary inequities
14:26 Duke's characteristics as a younger institution
17:43 Special potential for trying new things
20:02 Continuing to build and hire faculty during economic downturn
22:05 Continuing research during deanship
22:43 Motives for continuation
23:37 Description of lab's iron research
25:02 Personal appeal of lab work
27:23 Conclusions of research
30:46 Consulting with other physicians about iron disease patients
32:51 Reasons for closing lab
35:54 Achievements as dean
37:04 Recruitment of faculty and deans
38:19 Developing primary care leadership track
39:39 Developing masters program in Biomedical Sciences
41:00 Broadening offerings of Office of Faculty
44:10 Effect of budget limitations
45:19 MedX partnership with engineering school
46:54 Concluding term as dean
48:12 Ongoing contributions to Duke
Supporting new dean, Mary Klotman
49:36 Roles with national academies and university, philanthropic, and pharmaceutical boards
56:00 Reflections on scope of dean responsibilities and the importance of supporting team

TRANSCRIPTION, INTERVIEW 1
DATE: January 8, 2019
LOCATION: Nancy Andrews's office, Nanaline H. Duke Building, Duke University Medical Center
CITY, STATE: Durham, North Carolina
AUDIO FILE: 01.wav

Joseph O'Connell:	00:01	We are recording, and I'll go ahead and identify the recording. My name is Joseph O'Connell, and I'm interviewing Dr. Nancy Andrews, and it is January 8th, 2019, and we are in Dr. Andrews's office. This recording is for the Duke University Medical Center Archives and Libraries' oral history program. So thank you first of all for sitting down and doing this recording with me.
Nancy Andrews:		My pleasure.
JO:		And I usually try to document some biographical details at the outset, so I wonder if you could tell me your full name and your birth date and where you were born.
NA:	00:47	Ok. My full name is Nancy Catherine, with a c, Andrews. And my birth date was November 29th, 1958, and I was born in Syracuse, New York.
JO:	01:00	Okay. And of course, you were dean at the medical school for about a decade. And can you tell me your current positions?
NA:	01:12	So my current positions are Dean Emerita and Vice Chancellor Emerita. That just means I was dean basically. And, also I'm the Nanaline H. Duke Professor of Pediatrics, and I'm a professor in the Department of Pharmacology and cancer biology.
JO:	01:32	Okay. And so could you describe just very briefly what each of those roles entails now at this, at this point in your, time at Duke?
NA:	01:42	It's really just about being a professor. Well, for the most part, what I do is, essentially try to help out however I can. I provide any advice that either the dean or department chairs would like. I help out with nominations for various honors taking advantage of knowledge I have from working with the American Academy of Arts and Sciences, the National Academy of Medicine and the National Academy of Sciences primarily. And I've been on selection committees for some of the major medical honors and

so I have some insight into what the selection committees are looking for for those. I help out with recruitment. I help out with mentoring of junior faculty, and sometimes senior faculty, and I also represent Duke, nationally for a variety of organizations, including those I've already mentioned.

JO: 02:58 Okay. Thanks.

03:00 And I do want to talk a little bit about your upbringing and, am I correct in thinking you grew up in the Syracuse area?

NA: I was there until I went off to college.

JO: Okay. And can you describe your family?

NA: So I'm the oldest of four children. I have three younger brothers. My father who's no longer living, he died in 2015 at the age of 90, was a lawyer for his career. Initially, had a major interest in services for underserved communities within the city of Syracuse. He was also active in politics, locally serving in a number of offices and at one point running unsuccessfully for mayor, and later in his life, put his attention to legal cases related to arson. I think he probably at another time would have been a scientist, but was very interested by the science behind fires.

04:16 My mother is still living. She's 88, and she spent her career as a social worker in a number of different roles, including working at Planned Parenthood, counseling prison inmates, working just as a private counselor therapist. She taught some at Syracuse University and probably other things I'm not thinking of. And she's probably been retired for 10 years, maybe a little bit less. My brothers are all younger than I am. The oldest is an economics professor at State University of New York at Oswego, I believe he's currently chair of the department, although lose track of those kinds of things over time. The next brother is a judge in Syracuse, and in the city court. And then the youngest brother has spent most of his career in Washington, almost all of it, and in a variety of different roles--most recent government role was Deputy Secretary of Commerce. And his current position is as the global vice president for public policy for a company called Softbank based in Japan.

JO: Wow. Ok. And so, an eclectic group of siblings.

NA: Yes.

JO:		And what were your parents' names?
NA:		My father's name was William Andrews. Went by Bill, and my mother's name is Virginia Rogers Andrews.
JO:	06:07	Okay. Yeah, I always like to document that information in case anybody's doing genealogical research or anything like that.
NA:		Yes.
JO:		So another thing that I'm wondering about is at that time in your life, during your upbringing, were there things that contributed to your, to the formation of your interest in science or medicine that you think of as connected to your youth?
NA:	06:38	You know, it's hard to say going way back. I think I was broadly interested in many things. Most of the way through high school I was very interested in music and very involved in music. Interested in languages and took full advantage of all of the language, foreign language offerings at my high school. I loved math and finished my math curriculum early in high school. And, I think was first intrigued by science just because it was in some ways more challenging than those other areas, at least for me. And I had some outstanding science teachers. I had outstanding teachers and other areas as well. But, in particular I had a chemistry teacher who took a special interest and encouraged me to apply for different kinds of summer opportunities and enrichment opportunities and those worked out and, or at least one major one that I remember worked out, and I think that accelerated my interest in science.
JO:	08:04	Is the one that you have in mind what I read about where you had the opportunity to work in a university lab as ahigh school student or is it something different?
NA:	08:10	It was something different, but it was actually kind of related to that. It was an experience where for five or six weeks, I could go to Cape Cod and work on a marine biology project as part of a group. And, I loved that it was a lot of fun, and in fact, there were two terms over the summer. My scholarship was for this first term, but I talked them into letting me stay for the second five to six weeks so that I could keep going. And in exchange for keeping me I was the cook for the whole team.
JO:		Wow. What a cool opportunity.

NA: It was fun. And so the high school project came out of that. I think that was probably the summer after my junior year of high school.

09:05 Yes, that's right. And I got interested in a particular kind of crab, the horseshoe crab, which is an ancient creature that has blood with a very interesting property, which is actually exploited in medicine or in making medicines. If it comes in contact with a tiny, tiny bit of a product from nasty bacteria the blood clots. Not necessarily so great for the crab, but very interesting. And so I wanted to follow up on that. And I went with a bunch of friends from high school back to Cape Cod after school started and we collected about 30 of the crabs, and I brought them home and put them in saltwater tanks. And I approached a professor at Syracuse University who was working on a different kind of crab to see if I could work in her lab, and she was willing. And so I would walk over there after school, taking one of my victims, or subjects, I guess in a bucket. And then worked in her lab trying to begin to get an understanding of why the blood clotted when it came in contact with this bacterial product. Others figured that out. I didn't, but it was fun.

JO: 10:36 Yeah. Wow. I have so many questions. That just sounds like such a unique set of activities for young person to be engaged in. I guess I'm curious about how the adults around you were thinking about this. Like for example, when you came home with a bunch of horseshoe crabs and you wanted to hang onto them for a while. What did your parents think of that?

NA: 11:03 They were generally pretty good about it. Actually, amazingly good about it. Maybe because my bedroom was up on the third floor of the house, so they were kind of out of sight in general. I brought back not just the 31, I think, horseshoe crabs, but also, at least one blue clock crab or blue crab. And that was a bit of a problem because somehow it got out of the tank and disappeared. And those have very sharp pincers and it didn't attack anyone. But, many months later it was found on the floor of my father's closet.

JO: 11:46 Wow.

NA: But they were great about it.

11:49 And they let me set up the saltwater tanks and, I don't remember all of the details of how I did that. I just remember having a bunch of big tanks in my bedroom and having to re-circulate the water. We brought the crabs back from Cape Cod in big plastic garbage cans full of salt water. And I don't

remember for sure if I use that water and just kept cleaning it or how it worked. But it worked pretty well.

JO: 12:23 The other person that I'm curious about their reaction was the scientist that you approached at Syracuse University. How did that conversation come about, and how did it go?

NA: 12:35 So I had an inside track because my father was her lawyer and he said, “My daughter's interested in science, would you talk to her?” So I went over to talk to her and she was wonderful about taking the time to hear what I was interested in, and really teaching me how to do the basics. Teaching me herself. She had a very small laboratory. I think there might have been two other people, maybe a technician and a graduate student. And she took the time herself when I went over there to show me how to make chemical solutions and how to use the kinds of columns that you used to prepare protein extracts and how to use centrifuges and really, I don't remember anyone else ever being responsible for me. I think she did it all herself.

JO: 13:35 Wow. That's amazing. Yeah. What was her name?

NA: Her name was Marilyn Kerr.

JO: Okay. And I know that no one thing that you've discussed in some of your other interviews is the role of women in science and the underrepresentation of women in science. So, did it make an impression on you that to see a woman in a role of a science professor at that point? Was that unusual?

NA: 14:07 You know, I think my most influential science teachers, different for math, that was all men, but, and different for physics, but at least for biology and chemistry, my most influential science teachers in high school were women and I don't think I ever really thought about women being underrepresented at that point.

JO: 14:29 Yeah, that makes sense. So would I be right in saying that the research that you were dealing with the horseshoe crabs connected to the research that you did subsequently--was it scientifically related?

NA: 14:52 Only in a very indirect way in that it had to do with blood, and I became a hematologist later. People have red blood, horseshoe crabs have blue blood. It actually looks blue because it's copper based and copper tends to turn things blue or be blue when it's in a number of different forms. And our blood is red because

iron tends to be red. If you see red soil for example, you know it's got iron in it or rust or blood. But it was in retrospect kind of a maybe an early connection because there--we used to watch science movies in class, probably in elementary school and, probably from the 1950s, so it had been around for a while, there was a set of movies about a character called Hemo the Magnificent, and it was to teach us about blood and about red blood and blue blood. And so I loved those movies. I think it made a big impression on me. Actually years later. I don't know that I have them here, but I actually got a couple of them from Ebay. Because I just thought that's something I'd like to keep.

JO: 16:20 Wow. Did you get them on the old film reels?

NA: 16:25 I think I got them as video cassettes. I actually never watched them, but at least I have them. Or never watched them as an adult.

JO: That's right. At least, you know that you've got them if you ever, if you ever want to reference those again. Maybe some future research project.

NA: Yes. That's right.

JO: Yeah. Okay. And so with the horseshoe crabs, did you ever learn anything concrete from those experiments?

NA: 16:55 No, not in a scientific sense. Only in learning how to be in a lab. And in that way it was very useful because I, became more comfortable with the kinds of, equipment and procedures that you do in a science lab.

JO: 17:13 Okay. Yeah. And from what I understand, you went to undergraduate at Yale?

NA: Yes.

JO: And, it sounds like you probably already knew that you were on a science track when you entered Yale. Is that accurate?

NA: 17:31 Yes, I--at that point I was pretty sure that I wanted to be a chemist or when I learned about biochemistry, maybe a biochemist, so definitely.

JO: 17:43 Okay. And I'm curious about what your experience was like an undergraduate student and what the culture around you was like at the time. How did you--how did your interests and your

approach to school, how was it similar or different to your peers? Did you find sort of a community of likeminded people were or not there?

NA: 18:10 I think that I did, although it was a very different time. When I went to Yale, I was in the fifth or sixth class that accepted women. Accepted women from the beginning. I don't remember what year that started, but we were still only about 20% of the class, if I'm remembering correctly. And so that was quite different from high school. Not so different from medical school later--about the same, but I think Yale was still pretty early on in figuring out how to have a coed institution. And, in retrospect I think that probably influenced things at the time. Just seemed like fun to be, have a lot more boys than girls. But I think it was probably a different experience. I got involved in science pretty early on.

19:15 I had a bit of a handicap because our school didn't have an opportunity for AP science courses. I didn't even really know they existed. And so, I had some catching up to do with students who had come from schools that had stronger high school academics. But it all worked out, you know, after a year or two, I was able to catch up, and I think my friends were sort of a mix, maybe more non-biology majors than biology majors. But labs are very social environments, and I worked in two different labs and so also had some good friends who were from the lab rather than from the college.

JO: 20:15 So in general, it felt like a good place to pursue what you wanted to do.

NA: 20:19 I think so. As a freshman I went to a guy, a biology professor, who I knew had gotten his PhD at Syracuse University. So we had a connection, and asked if I could work in his lab. And he debated for a little while and then agreed to let me be sort of a work study student there. And so I took care of his frog colony and I made solutions. But it was fun just being back in a lab environment. And then later on, I was able to actually be involved in research projects in a different lab.

JO: 21:04 I think I read that there were a few scientists at Yale whose labs you spent some time in who had done some pretty high profile research or went on to do some pretty high profile researcher. Is that accurate, that there were some fairly well known scientists that you got to rub elbows with.

NA: Yes, absolutely. But, so the person from Syracuse University was a biologist named Joel Rosenbaum. And after I finished my work

study time in his lab, actually after I started to get course credit for lab work, it made more sense to be in a different lab. And I worked with Joan Steitz, who is still living, she was quite young at the time, and she's one of Yale's superstars, has been since the time I was there. And we're still in touch from time to time. In her lab I met a number of people who went on to great science careers themselves and, it was a very--her lab was very interactive with other nearby labs and so I also got to know people through that.

JO: 22:21 Okay. So who would have been some of the biggest influences on you during that time? Is there anybody like to say a little bit more about in particular?

NA: I think probably Joan herself. She was and is a very rigorous scientist and has a great both rigor and creativity in her science. And one of the very exciting things was while I was in her lab she figured out that small RNA molecules are involved in RNA splicing, how you take a piece of RNA and remove the unnecessary stuff to make it a mature, what's called Messenger RNA. And Joan first discovered several classes of small RNA protein complexes and then made it a huge leap in predicting--and it turned out to be true, and she and others proved it--that those RNA protein complexes, some of them were involved in the process of RNA splicing. And so I was in her lab as that happened, and that was very exciting. I think the other thing about it, well several other things that were very influential. First, I learned a lot of techniques that are rarely used today but occasionally turned out to be pretty helpful. And so I learned a lot about how to be a scientist and what scientific tools were available from being in her lab. But probably the most important lesson was she had--actually, let me just take a sip of this.

NA: 24:32 She had heard that patients with a variety of autoimmune disorders had antibodies that seem to be against RNA--small RNA molecules. Sorry, I got that a bit wrong. That seemed to be against complexes of RNA and proteins. And for a variety of reasons, she thought that was interesting. And in an experiment that would be a lot more complicated to do these days because of different regulations, a graduate student in her lab was able to get some patient blood samples and show that the patients did have auto antibodies or a self reacting antibodies against RNA protein complexes, but that the RNA molecules were--sorry, I'm losing my voice.

JO: That's ok. Take your time.

NA: The RNA molecules were small and previously unknown. And those are, these small RNA protein complexes, some of them turned out to be involved in splicing. But it was a huge lesson for me that not only can lab work teach you about diseases and taking care of patients, but you can learn from patients certainly by what they tell you.

26:16 And that came later. But also, that biological specimens from patients could help you learn about fundamental aspects of biology. And for me that was very, very exciting to have that two way transfer of information from the lab to the patient and through the biology of the patient's disease from the patient back to inform discoveries in the lab.

JO: So those discoveries were a really practical illustration of how, how medicine and science we're kind of reciprocal.

NA: In the very best way. Yes.

JO: Yeah. Okay. And I'm curious to ask a little bit more about that lab since it seems like it is actually historically significant. And you mentioned there were some kind of techniques that aren't as common today that you learned. I wonder what are those techniques, what are those like?

NA: So one of them for example, was to sequence RNA.

27:28 And you hear a lot about people sequencing DNA or sequencing CDNA, which is a DNA copy of RNA, but using enzymes with varying specificities for the components that--the building blocks of RNA--it was possible to deduce the sequence of the RNAs directly. No one does that anymore. Very few people would do it anymore. But in doing that, not only could we get important information, but also I learned a lot about how it works. About the science behind the technique. Joan's lab was also one of the very first labs at Yale to be able to do sequencing of DNA. Now there are big machines that do huge amounts of DNA sequencing very fast. But in those days it was quite an ordeal and it was something of an art. And what you had to do was first to, well at least setting up the experiment, the first thing we did was to pour a gel.

28:46 And what that meant was you would make a mold out of pieces of glass and then pour a solution into the mold that would polymerize and form something that was like gelatin basically. Although, but the chemical structure is completely different, but same idea. But what made it difficult was that in order to, in

the early days do DNA sequencing, those gels had to be super thin, like half a millimeter thick, which is very thin. And they had to be very long. They were about three or four feet tall. And so we had to do some special tricks to be able to get this gel that we needed for DNA sequencing. And then we also had to do a bunch of chemical reactions and first an enzymatic reaction to label DNA. This is probably more detailed than you want.

JO: 29:53 It's a little bit over my head but I think if somebody is interested in the science, they're going to want to know those details.

NA: Okay. So you have to,

30:03 first label the end of DNA in a precise way so that you know what that end is and then separate the two strands of DNA and then do chemical reactions, partial chemical reactions, to get all of the different kinds of products you would have gotten if you did that chemical reaction at only one place in the DNA. This is complicated, but at any rate, the short version is it took about a week to set up and to do and to get your DNA sequence and at best, if you did a terrific job with it, you might get 80 or 90 base pairs. Now there are machines that can get hundreds of thousands of base pairs, you know, in a much shorter time. But that was early days and it turned out that that was a very useful thing to know because when I later went on to graduate school, I was one of very few people who knew how to do that and could help out in doing that.

31:12 But that was in 1978, 79, early part of 1980, and that was just when DNA sequencing was emerging as something that could be done in multiple labs.

JO: So that was pretty innovative. It was--I can see why you would call it an art because it sounds like it's very delicate. Like you--there's not a lot of room for error.

NA: And one of the technicians in Joan's lab was a calligrapher and she needed a paying job, I guess. And so she worked as a technician in the lab and Joan actually hired her because she was so precise in her calligraphy that Joan thought that would translate into being able to do these very careful, meticulous tasks in the lab. And it was true.

JO: Wow. So having a steady hand was actually one of the most valued characteristics in the lab.

NA: And being very detailed oriented helped, helped in this case as well.

JO: 32:21 Okay. Wow. That sounds fascinating. And yeah, I-- I'll move us along just so that we don't get too far behind for the day, but I know that after Yale you went to Harvard, is that right?

NA: Yes.

JO: And can you say a little bit about why you made that choice and what you were expecting or what you were thinking about for your future at that point?

NA: 32:56 So inspired by Joan's lab and by the things that I just told you, I decided that I wanted to also be an MD PhD student. I had worked with a number of them in Joan's lab and I thought that the mixing of medicine and science was really exciting. And the service aspects of medicine appeal to me and the intellectual aspects of science. And so I applied to MD PhD programs for graduate school for medical school and graduate school. And actually ended up going to Harvard even though that was the only place where you couldn't immediately join an MD PhD program. And the reason that I went to Harvard was that there was a much bigger selection of possible labs to work in than there had been at any of the other institutions, and I didn't know for sure what I wanted to do, but I liked the breadth and the mass of the science there.

JO: Ok, so just the panorama of options was part of the draw for you.

NA: Yes. And they had assured me that in my second year I could join the MD PhD program, which is what I did.

JO: 34:26 Okay. And, at some point during your doctoral education, was that when you decided that you wanted to look specifically at iron disorders?

NA: 34:39 No, that came much later.

JO: Oh, okay.

34:42 So how did your interests take shape as a doctoral student?

NA: 34:47 Well, I was interested initially in immunology and I went to David Baltimore's lab at that time. He was very—he's continued to be for many years, but he had started recently to be

interested in immunology and started my PhD work on a project related to how immunoglobulin genes rearrange. And my work was following up on something that someone had done in the lab before I got there. And it turned out that the interpretation of the earlier results was wrong. And so my project fizzled. There was no longer a reason to do it when we realize that the earlier results were just mistaken or the interpretation of the earlier results was mistaken. And so at that time I switched to working on polio virus, something completely different. And did for my graduate work what was sort of a continuation of my advisor, David Baltimore's, graduate work 20 years earlier. And so I finished my PhD. I did my PhD work over at MIT because that was an option for us. And I liked their program very much. But it wasn't until actually I was a faculty member that I got to iron.

JO: 36:15 Okay. And you were on faculty at Harvard after--?

NA: 36:21 At Harvard. I finished school. I got both of my degrees. I did residency training in pediatrics, a fellowship training in pediatric hematology, oncology, and then, for fellowship research joined Stuart Orkin's lab, which was in the hematology division. And there worked on red blood cells and how they--basically how they made hemoglobin--or part of, a piece of the process of making hemoglobin. And finished my fellowship, joined the faculty at Boston Children's where the Orkin lab was and--which is one of the Harvard medical school hospitals. And only a year or so, well, a few years after starting my own lab did I move to iron.

JO: 37:16 Okay. So that was really the end of a long sequence of different, different kinds of—

NA: Yeah. Different kinds of science.

JO: Okay. Well, so what year was that that you set up your own lab? Do you remember?

NA: 37:33 Yes, it was April of 2000--sorry, 2000--April of 1993. My daughter was born in November of 1992 and so I--actually it might even have been a little earlier than April. But I took a few months off when she was born and then when I came back very shortly afterwards, my lab space was ready and so I moved in.

JO: 38:05 What do you think about skipping ahead to that point? Do you think there are big topics during your previous research that we should touch on before we get there?

NA: I think not, not so much related to the research, probably.

JO: Okay. And any particular people that we should talk about who were a part of your Harvard education or MIT education that made a particularly big impact on your thinking or your approach to your work?

NA: 38:36 I think one person who should be mentioned is David Nathan, who was the physician in chief at Boston Children's hospital, chair of pediatrics at Harvard medical school when I was a student. And then later was the president of the Dana Farber Cancer Institute. He's now retired. He's going to turn 90 in a few months and is no longer active. But as a medical student I had some difficulty deciding whether I wanted to go into pediatrics or internal medicine. And so the dean for students at Harvard sent me to see David Nathan because he had been an internist who became a pediatrician as a faculty member. And David has been a really key person ,role model, and mentor for me for many, many years.

JO: Can you describe what his style is or what you've learned from him?

NA: Wel, we're very different in many ways. He's a pediatric hematologist or was, and I think what we have in common was, is that he's passionate about the things that he's interested in, whether that's taking care of patients or research in his laboratory.

40:06 He was a physician scientist. He--once he sort of latches onto a problem, he won't let it go until he's found a solution. And I think I tend to be like that also. Another thing I learned from him was that even though he was this big guy in charge of everything, he was very down to earth and extremely supportive and interested in my career. And an example of that is, when I was pregnant with my daughter, my first child, I went into early labor, too early, and was put on a medicine to try to stop the labor and sent home for bed rest. And David knew me well enough to know that it was going to be hard to, you know, prevent me from doing things. That was a time when I had a lot of really interesting stuff going on in the lab.

NA: 41:06 And we were just about to get out a paper, which I actually finished the night before my daughter was born. But he, so he heard that I had been in the hospital for a week, actually I think he came to see me there, and then I was sent home and I wasn't supposed to do anything. And as soon as he heard that I had arrived at home, he drove over to my apartment in Cambridge

from Boston, marched up the stairs and said, you're not going anywhere. You're staying right here. We'll buy you a fax machine. There was no email in those days so that you can keep in touch if you want to, but you're not going to do anything except stay in this apartment. And I said, Dr. Nathan, I have to take the pediatrics boards in a week, and I need to leave to do that.

NA: 42:01 And he went into my kitchen, got on the telephone. This couldn't happen these days, I don't think. Called up the head of the American Academy of Pediatrics and said, I have someone here who needs to take the boards, and she can't leave her apartment. So I'm going to ask my executive assistant to come and proctor her, and I want her to take the exam at home. And amazingly they said yes. And so I took two days' worth of pediatrics boards sitting in my dining room with David's executive assistant. And so that was just the way he was. He would get very personally involved in the things that he cared about, whether it was taking care of a patient or taking care of one of his residents or junior faculty members. So that made a big impression.

JO: 42:51 Yeah. And it sounds like he showed an interest not just in your career but also in your wellbeing as a person. Is that fair to say?

NA: Yes. Absolutely.

JO: Well we are running up on 45 minutes. So I think we should talk a little bit about your lab and the sort of, the highlights of some of your research achievements. Especially with iron disorders and diseases. Yeah.

NA: 43:28 So we got interested--I got interested in iron originally in part because I was studying red blood cells, and we didn't know a whole lot in those days about how red cells or the body in general handled iron. But we did know it was very important for making hemoglobin and making the red cells red. And also because there was a medical student at Harvard who was very, very interested in iron and there was nobody around for him to work with. And so long story, but we connected with each other and he really became the first person in my lab and ultimately helped push the whole lab towards iron. We started out asking the question how iron gets in and out of human cells or, we worked in mice but could easily extrapolate those results to humans. And after we had figured out answers there, we went on to asking how those processes of iron moving in and out of cells were affected in different diseases.

	44:46	And we got some insights there. We--I started to hear about patients from all over the world who had different kinds of iron disorders that nobody could figure out. And because that was becoming my specialty, I had a lot of referrals and we asked what was going on in those patients and figured out the biological cause of their diseases in several different types of diseases. One was, well actually it's too much detail, but at any rate, which was a lot of fun, and then we did a bunch of other things to just try to understand the missing puzzle pieces in understanding how people and mice use iron and make sure that you have enough of it without having too much.
JO:	45:52	And were there, immediate applications of that research during that time period? Did you start to see the benefits of your insights in practice at that point?
NA:	45:55	It gave me some insight into how to take care of patients I saw with iron disorders. I think it was probably most helpful for understanding those disorders being able to diagnose those disorders. So for example we found that patients who had an inherited form of iron deficiency anemia had mutations in a particular gene, and now all over the world, when patients come in that might have that disorder, the gene test can be done to confirm whether or not they do. So I think more useful for diagnosis, for predicting the course of diseases, than directly from our work for treatment, although pharmaceutical companies have followed up on things that we did to try to make new kinds of treatments.
JO:	47:11	Okay. Yeah. And I'm curious about how your evolution as a leader intersected with your research. Were you, let's see, I believe that your first administrative role was in ‘96. Does that sound right?
NA:		Yes. That’s right.
JO:		And was that a major change for you? Was that something that you anticipated?
NA:	47:40	So I was still very early in my career at that point. I started my own lab. I'd joined the faculty in 1993, so I was only a few years into it. And that role had to do with being the chair of the Admissions Committee for the MD PhD program at Harvard and the associate director of the MD PhD program. I was interested in that not only because the students were fantastic, but also I--when I was asked to do it, I agreed because I knew problems with the program that had been problems since I had been a student that still weren't fixed and I was anxious to be able to

work on those. There was always a balance between my research and my administrative work. Early on it was also a balance between my clinical work, my research, and my administrative work.

48:39 From very soon after I opened my lab, I was an investigator of the Howard Hughes Medical Institute. And Howard Hughes provides very generous support. At least it did in those days. I think it still does, but one of the requirements was that 75% of your time had to be towards research. And so it slimmed down the amount of clinical work and later administrative work that I could do. And so it in a sense helped me strike a balance. It defined what the balance had to be. But for administration, I moved to higher and higher positions along that sort of physician-scientist-leadership pathway.

JO: 49:28 Yeah. And you mentioned that there were certain problems that you saw that you encountered during your career prior to this that kind of motivated you to want to step into a leadership role and change some of those things. Can you say a little bit about what those problems were and what you--how you were able to address them in this phase?

NA: 49:53 So, one of the problems with Harvard's MD PhD program was that in contrast to other institutions you had to be accepted into the program in your second year of medical school, as I had been. They had already fixed that one, but there was very little integration between the medical school part and the graduate school part, and I thought there were better ways to do that. There was very little sense of community among the MD PhD students. They were really just considered medical students when they were doing the medical school part or graduate students when they were doing the graduate school part. And there were some issues with--technical issues with the funding. I felt like I had a very strong sense of what was broken and wanted to try to help, particularly early on, in helping the students feel more supported and more part of a community.

I think the real turning point was in 1998, 1999 when Harvard almost lost the grant that supports its MD PhD students because other schools had gotten further faster. And at that point there was a change in leadership, and I became director of the program, and in that role I could finally do much more to implement the changes that I thought were important.

JO: 51:33 Okay. Alright. Yeah. Well, let's see. So we've been talking for about 51 minutes, and I don't want to eat into too much of your

day here. But if we pick up tomorrow with starting to talk about your—

NA: Thursday.

JO: Thursday, right, exactly. You know, talking about your decision to accept that the deanship here. Is there anything from this previous part of your career that you think that we should make sure to touch upon that we kind of glossed over?

NA: 52:15 I don't think so. There was just one more step between being MD PhD program director and coming here. After I did that for four years, I became-- well for one year it was called associate and then dean for basic science, basic sciences and graduate studies at Harvard Medical School. And that was the position above the MD PhD program director, but also had a bunch of other responsibilities, and I think that was really outstanding preparation for coming here to do this job. And so it was--it was fun. It covered a lot of areas. I had oversight of a lot of areas that I was interested in from science to education. And it was really good preparation.

JO: 53:05 So that was sort of the bridge to taking on something like a dean of a academic medicine center like Duke.

NA: Yes.

JO: Well, I guess one thing I am kind of curious about is sort of like, what do you think that--when you were promoted in these leadership roles--what do you think it was about what you had to offer that made you an attractive candidate and that led to these opportunities?

NA: 53:49 Hard to know for sure, but I think I was very reliable. You can't overestimate the importance of that for leadership positions. I was very willing to roll up my sleeve and sleeves and try to tackle the more challenging problems. I didn't push them off to someone else or procrastinate. I just did it. I think that I was very trustworthy, you know, if I said something people could believe it and I think that was important. And I think I at the time that I wouldn't have put it this way for sure, but I think in a sense I had a vision of, where these different roles, where things could go and how to get there. If you had asked me at the time if I had had vision for the role, I would have not known what you were talking about, but looking back, I think I had in my head, another way to say it is what needed to be fixed or

		what we could do strategically to be much better. And I suspect that, even if I couldn't see it, others, others could see it.
JO:	55:10	Yeah. They could tell that you had a grasp on what would work, from an organizational standpoint and how to--how to improve the way that the school was working as a unit
NA:	55:24	And take--and find opportunities and take advantage of them. I think so.
JO:	55:29	Okay. Great. All right. Well, unless you have anything else that you want to add at this point, then we could end this part of our interview and pick up again on Thursday.
NA:		Sounds good.
JO:		Okay. Thank you.
NA:		Thank you.

TRANSCRIPTION, INTERVIEW 2
DATE: January 10, 2019
LOCATION: Nancy Andrews's office, Nanaline H. Duke Building, Duke University Medical Center
CITY, STATE: Durham, North Carolina
AUDIO FILE: 02.wav

JO:	00:00	And I'll say something briefly to identify who we are. My name is Joseph O'Connell, and I am interviewing Dr. Nancy Andrews and we're in her office right now. It's January 10th, 2019 and this recording is for the Duke University Medical Center Archives and Libraries' oral history program. So last time we talked, we left off with your last position at Harvard, and I believe that was the Dean for Basic Sciences and Graduate Studies.
NA:	00:40	That's correct.
JO:	00:42	And you were in that right role from 2004 to 2007, and then you made a transition to a new role. Can you talk about how the opportunity to take the position as dean at Duke--how did that come about?
NA:	01:03	Certainly. So, I think that I probably had some visibility nationally among institutions searching for deans. I had inquiries from several of them before Duke and felt that it would be good to move from Harvard. I had been there for 27 years. And it's in my view better not to spend your whole career in one institution. But at the same time, I would only move for the right opportunity. I had actually never visited Duke before I came down for my interviews, but I knew about it by reputation and so when I had a call from the search firm and from people at Duke, I did come down to look at and was very impressed with what I saw.
JO:		Okay.
	01:57	Can you describe that first visit? What was going through your mind?
NA:	02:01	Wow. You know, I think it struck me as a very big place, full of energy. It's much more spread out than the northeastern campus I was used to, and everyone seemed very friendly and in a sense hungry for making a great institution even better. Very welcoming.

JO: 02:31 Yeah. And so that seemed like a good fit for you.

NA: 02:35 It did, you know, it was a big move because I had never lived in any other part of the country besides the northeast, but it felt like the right place.

JO: 02:50 Yeah. Did you have any concerns about the sort of cultural differences of living in a different region--?

NA: 02:59 Not--

you know, I think, having grown up in the northeast and sort of becoming aware of national events in the mid-1960s, I had heard a lot of things about the south and what was going on here during the civil rights era, I guess, in the 60s. And so I had some general concerns and prejudices about the south, but I think those were put to rest pretty quickly by finding out that this was a very open, forward looking diverse and as an institution and probably as inclusive as any place that I had known.

JO: Yeah. That's interesting. So, what you saw here fit the kind of environment that you--fit your idea of the kind of environment and you wanted to be in in terms of diversity.

NA: 04:10 Yes, yes. Or at least it, you know, I don't think that environment really exists yet, but at least it was on its way and continues to be on its way.

JO: 04:22 It seemed like a place where progress could be made toward that.

NA: Yes. Yes.

JO: Were there other tangible things either about the position or about Duke as an institution that made you think this is the one, this is the opportunity that's worth uprooting for?

NA: 04:38 I saw a lot of potential in the faculty and in the students and some of that had been realized already, but there was more to do.

JO: 04:51 Yeah. Do you want to, mention any particular examples?

NA: 04:55 Wow. It's been, I guess it's been almost, well about 11 years since I first came down. And so it's a little hard to remember, but there was plenty of room for building new buildings. We did

a little bit of that and for developing new programs and we did some of that also, working from a great sub straight of terrific people.

JO: 05:28 Yeah. Okay. And I noticed that you were interviewed by several national publications shortly around the time you became Dean here. Did you know that taking the position here would put you in the public spotlight in that particular way? At the national level? And in the mainstream media.

NA: 05:50 I didn't really expect it at that point. I mean, I saw it as, you know, taking a different administrative role. Duke made a big deal out of the fact that I was the first, and at the time I stepped down, still own the only ever a woman dean of a top 10 medical school. My successor Mary Klotman is the second and still only, at this point. But, and I guess that grabbed a lot of national attention. I hadn't really thought about that before taking the job.

JO: 06:30 Yeah. And were you excited about being part of that conversation or did it--I mean, it took you by surprise, but was it a pleasant surprise or was it uncomfortable?

NA: 06:41 It wasn't really uncomfortable, but it was a disturbing in that in 2007, when some other fields had made a lot more progress, medical school, academic medicine in general, was kind of behind the times. And there had been women deans at other medical schools for at least a decade before. I can't remember exactly. But what got the attention was it was other schools that people felt were not like Duke. And I think the proportion of deans who are women is still relatively small. It hasn’t improved all that much. So it's clearly a symptom, I think of, a bigger issue in academic medicine, but--so I don't think it really made me uncomfortable as much as just sorry that more progress hadn't been made.

JO: 07:44 Yeah. And was that a turning point for you in thinking about diversity and inclusion as one of one of your objectives or had that already been something you were working toward and, you know, already thinking about?

NA: 07:59 That was in my DNA my whole life. You know, I think that it was always something that was important to me, important to my parents, my grandparents. And so it was something I grew up with, both in terms of thinking about diversity of gender, but also diversity of race and nationality and ethnicity.

JO: 08:25 Right. And before you were at Duke, what sort of--bringing that perspective to your work at Harvard,

NA: At Harvard?

JO: What were some of the things that you did to try to foster sort of change that you wanted to see? In terms of the makeup of the students or the staff?

NA: 08:47 At Harvard?

JO: Yeah.

NA: The kinds of things that I did were to sometimes set up special meetings with faculty. So my primary domain there was, in my last role, was the faculty in the basic science departments. And so I set up meetings with junior faculty members, who were women or I think there was only one at that time who came from a racial minority group, and tried to figure out ways that I could help nurture their careers. I set up a group of women faculty members that met about every six weeks with no strings attached. It was just drop-in and come talk if you listen to, and it gave the women not only a way to meet and get to know each other because coming from different departments that wasn't a given, but it also I think help people realize that they had shared experiences.

NA: 10:01 I shared many of those experiences, and gave them ways to talk about strategies to deal with disadvantages.

JO: And would you be willing to say a little bit about what the disadvantages was that you observed or that you experienced?

NA: Yes, sure. So they've been the same for a long time. And in the late 1990s, MIT where I did my PhD work, although this was after--well after I finished that--did a study initiated by some of the women in its school of science looking at disadvantages that women faculty had and they included salary. You know, I think it's been known for a long time that, in most fields, and it's true in medicine and science, women tended to have lower salaries than men at the same rank. It included the amount of lab space, that women faculty had versus men, the amount of administrative support, the likelihood of being put on important committees instead of unimportant committees. And I experienced all of those things. And you know, I think that hopefully it's gotten better, but those kinds of disadvantages were ubiquitous and still are pretty prevalent. And I think that it

was a real awakening for me to read the MIT report and realize it wasn't just me. And so I--that was the kind of shared experience that in this group we could talk about and try to find strategies to fix.

JO: 11:55 Okay. So part of your thinking was that rather than just face these obstacles as individuals you could actually come together and acknowledge what was going on and work together in some way--

NA: Yes.

JO: To kind of create the kinds of changes you wanted to see.

NA: And make noise.

JO: So there's an activist dimension to this group.

NA: Yes. Yes.

JO: What were some of the ways that you lobbied the administration or--?

NA: 12:21 Well, so I was the administration. So I tried to help keep very close tabs on salaries to find inequities and fix them. And it's something I did at Harvard, something that I did as dean at Duke. And what became apparent was that over time the salary inequities even if you fix them can redevelop. And so you've got to keep watching all the time to make sure that they don't pop up again. And it takes extra effort. But of course it's important. I remember approaching the head of one of the Harvard hospitals who I knew quite well. Right after the MIT report came out. So I don't remember which year it was, but it was late 1990s, and I asked him if women's salaries in his hospital were lower than men's. And he said yes. And I said, are you going to fix it? And he said, we can't afford to, an answer that I found a little shocking. I mean, it's practical. It's true that it's not easy to put the money in to do it. But I was really surprised that he not only knew it existed but wasn't trying to make a change.

JO: 13:41 They had documented it.

NA: Yes.

JO: And publicized it and yet they felt that they were--

NA: 13:46 They hadn't publicized it, but I knew because I knew him quite well, and I knew that the hospital quite well.

JO: 13:54 Right. So kind of keeping constant vigilance and keeping constant pressure on certain people to address those issues.

NA: Yes.

JO: That makes sense. Yeah. When you arrived at Duke, what else did you see going on here that you felt like the school was doing right? And what did you think needed to be changed, just broadly speaking? Not only in terms of inclusion.

NA: 14:26 I thought that, the science was even stronger than I had expected coming in. I didn't know very many scientists here. And by science, I'm speaking broadly from everything from test tubes to doing clinical studies. And so I was surprised by the strength of research here but also that word hadn't really gotten out. And so one of the things that I wanted to do was to try to give more visibility to the great things that were going on here. I thought that, I guess another thing that struck me was that in contrast to Harvard where there were hundreds of years of tradition, Duke was much younger school. And while there were decades of tradition, the school didn't seem as bound by having to do things the way they always had been done in the past. But was more agile and more nimble in making changes and accepting changes. I think one of the, which I saw I was a very good thing, one of the negatives or the only one that really comes to mind is, and maybe it goes along with being young and with not having at that time the recognition that it deserved, I thought that people were hard on themselves and on others in their judgment of how someone was doing. It was more likely at times to hear negative reports then to hear the positives. It wasn't as balanced as it might be.

JO: 16:25 Yeah. What do you attribute that to?

NA: 16:28 I'm not sure. You know, I think it may have to do with having been relatively isolated. There's UNC nearby, which of course is a great university, but without as many local places to compare to as there were in Boston, I think it's both easier to, it's easier to develop a unique culture and part of that culture was we got to keep working really hard to get better, and we're not doing well enough yet.

JO: 17:06 Uh huh. Okay. Yeah. Well, this is a heavy handed way to put it, but almost like an inferiority complex.

NA:	17:12	I think so.
JO:	17:14	Um, or at least, you felt like people could be taking more pride in what they were doing--
NA:	17:19	Yes. Yes.
JO:	17:21	The institution could have a stronger sense of self pride than it did.
NA:	17:26	Yes. And, you know, ideally not so much that it gets lazy, and people aren't always trying to be better, but I thought there could have been more positive reinforcement.
JO:	17:43	Yeah. I'm curious about, you know, the difference in the sense of tradition at Duke versus maybe a Ivy League school that has a longer history. What--do you have any examples of what, of what you mean when you observe that difference?
NA:	18:05	Well, when I was in the Dean's office at Harvard, people would come and say, you know, we want to do this new thing and it would be an interesting thing. But very often the answer that they got back and that often I was in a position that I had to give was we can't do it because we've always done it this other way. And there wasn't that sense here. If there was a great new idea, we'd try it. And I made it a very deliberate point when I came here of, instead of feeling like I had to say no as I did too often probably at Harvard, saying we'll find a way to get to yes.
JO:	18:54	Yeah. And in some ways the culture of the institution allowed you to take that approach.
NA:	19:01	Yes, yes. Which I think is great and it gave us capacity to do a lot more. You know, there probably was a bit of a difference between the school and the health system. I think, you know, I was responsible for the school. My sense of the health system was that there, it wasn't as easy to change approaches. It had had a lot of inbreeding in its leadership for a long time. And so I'd say that the culture of this is how we do things was stronger there.
JO:	19:43	I see. Yeah. Is there a particular instance of somebody bringing an idea to you and you thinking, you know, the Harvard part of you saying like, no, but then the Duke part of you saying, “Hey, wait a minute, maybe there's a way to do this.” Can you think of any particular cases of that?

NA:	20:02	Well it's not in a perfect fit for that, but not long after I got here, the general economy crashed and money was very tight. And we went ahead anyway and built what's now the Trent Semans Center, the new education building. And I think the fact that we could move forward was partly due to a wonderful gift from the Duke Endowment and then other gifts from alumni and friends, which ended up paying almost completely for the building. But the fact that we could even consider building a new building during depths of the economic downturn was kind of exhilarating, and it wasn't exactly that, you know, anyone was saying no, no, you can't do it. But I think we could take that risk. And it worked out very well.
JO:	21:04	Yeah. That sounds empowering to not have to sort of just obey the economic climate of the time.
NA:	21:11	Yeah. And we continued also hiring new faculty members when many other institutions stopped. They were worried about their finances. We were worried too, but we found ways to cut costs so that we could hire the people who were outstanding but not easily able to get as many job offers as they might have at another time.
JO:	21:38	Interesting. So that almost became an opportunity for Duke to build its faculty at the time that other schools were slowing down and being more conservative. Yes.
NA:		That seems like it would be a real leap forward, just that moment for the medical center here--just having being able to keep going at a fast rate.
NA:	22:03	I think it was important.
JO:	22:05	Yeah. And am I correct in thinking that you brought your research to Duke when you became Dean, too?
NA:		Yes.
JO:		Okay. And was that a given or was that a conscious decision that you made?
NA:	22:22	It was, well, I'd say most deans across the country stop doing research either before or at the time they became dean. So it's unusual, but it was important to me to keep going. I don't think I would have considered a dean job where someone said you can't.

JO: 22:43 Where were you in your research and why did you have that drive to keep doing it?

NA: 22:49 Mostly because it was a lot of fun and we were making progress. I'd had a very large lab towards the end of my time in Boston, probably for the last five to seven years in Boston. We were quite big and only four people moved here with me. The others either went to other labs to stay in Boston or finished up what they were doing and moved on to their next step. So the lab here was much smaller, but there were always plenty of ideas to things, ideas of things to do, and energy to do them. And so we hadn't finished answering the questions that we were asking.

JO: 23:37 Right. And what were the questions at that time?

NA: 23:40 Well, our overall question was to understand or overall problem we were trying to solve was to understand diseases related to iron. And there's sort of two, three general groups of diseases: when the body has too little iron, when the body has too much iron, or when the body has the right amount, but it's not in the right places. And we, in a variety of ways, tried to work out how those different classes of diseases were caused, mostly using mice but also sometimes doing studies with human patients, including patients that I had seen in clinic myself. And so we didn't have all the answers yet, and we just wanted to keep going. You never have all the answers, but there were still some big open questions that we wanted to help answer.

JO: 24:40 Yeah. So it was--it was really about trying to get a better handle on these iron related diseases.

NA: 24:48 And knowing that we had tools that could help us and help others as well. We distributed them to anyone who wanted them, but to try to make progress.

JO: 25:02 Yeah. And it strikes me that you described lab work as fun. Probably not everybody finds it fun, but what do you find fun about it?

NA: 25:14 I think it's just the essence of it is knowing that you're learning something or seeing something that nobody has known or seen before. It's very exciting, and also labs are very social places. I remember when I was young people would say, “oh, you don't want to work in a lab. You're more of a people person,” or “you'd rather do something with people.” And in fact, the community in a lab is as intense and interesting a social

environment as you'll find anywhere, or at least in the labs that I know.

JO: 26:00 Yeah. Do you think that you set up your labs to foster that community at all--?

NA: 26:07 Yeah, definitely. You spend so much time there. I mean, people work really hard in labs and unless you enjoy and enjoy personally and, collaborating with the people who are around you, it's a lot harder to go to work every day.

JO: 26:27 Yeah. Do you, do you have any stories that sort of illustrate the kind of social atmosphere of the lab or anything that would be unexpected to somebody who was not familiar with working in a lab?

NA: 26:42 It's hard to say.

JO: If nothing comes to mind, that’s ok too.

NA: Nothing immediately comes to mind.

JO: I think it's interesting, as somebody who hasn't worked in a lab, it's interesting to me what that experience is like.

NA: 26:58 Well it's, there are huge highs and very deep lows, and I think that the society of the lab helps people get through them.

JO: Yeah.

NA: There can be bad things too, like competitiveness and, you know, people who aren't fitting in well, but at least in my own lab that was rare.

JO: 27:23 Yeah. And so, did you feel like you made the discoveries that you hoped to make in the science that you were doing at Duke?

NA: 27:37 I think we got, we finished and in a sort of big picture way what I wanted to get done. There's always more to do, and they're always more interesting questions to ask. But we got a lot of it done.

JO: 27:55 Yeah. And is there a way to sort of summarize the conclusions or the applications, or is that still really something that you see as ongoing, and that other researchers are taking up?

NA: 28:06 Well, it's definitely ongoing and people around the world are continuing, but I think the big questions were, “how do three particular diseases come about?” One of them is a disease of too much iron called hemochromatosis. And we, and others, went from knowing nothing about how it came about to understanding a lot of what's behind it. Still not everything but we had a big role in that. Another is a disorder that we named iron-refractory iron deficiency anemia, which is too little iron and it's not only iron deficiency but it's inherited iron deficiency. So we knew that there had to be a gene responsible. And we went after it and found the gene, and I first got interested in that hearing about patients who had inherited iron deficiency. But then I think really got hooked on it when a patient walked into my clinic at Boston Children's hospital.

29:21 And both he and his sister were affected, and I really wanted to figure out what was going on, and we did actually very shortly after I came to Duke. And then the third one is I wanted to understand something that's called the anemia of inflammation, a kind of iron related anemia that people get when they're, they have a chronic infection or cancer and other chronic disorders. And a lucky insight helped us contribute a lot to understanding that.

JO: Okay, what was the lucky insight?

NA: Oh, it's--the lucky insight occurred in Boston, although we continued after that. But it was realizing that a patient with a very rare disease had a picture that looked like this anemia of inflammation, but the problem wasn't due to inflammation. And so we made a guess about what might be going on in him and proved that we were right. And then could generalize that to understand the disorder more broadly. Again, a patient that I took care of myself.

JO: 30:42 Wow. So a lot of your ideas really came from these encounters with individuals?

NA: 30:46 Yes. And I still get asked from time to time--it used to be very often, now it's just occasionally--about patients with unusual iron diseases from around the world.

JO: 30:58 So other physicians will track you down and say, “Have you ever seen anything like this before?” And that's ongoing.

NA: 31:07 Yes. It's, you know, now maybe it's every few months. At one point it was probably at least once a week.

JO:	31:14	Yeah. How often are you able to give them insights?
NA:	31:17	Hard to say. Sometimes I can say I think the diagnosis is such and such, but most of the time what I do is I suggest other ways that they can do tests or other questions they can ask the patients that may lead them to a diagnosis.
JO:	31:39	Okay. So giving them some diagnostic tools.
NA:		Yes.
JO:		Yeah. Okay. Yeah. So have you seen--I think you mentioned this yesterday--that one of the biggest impacts of your research that you've seen is really just being able to identify what's going on with a patient.
NA:	32:03	Yes, yes.
JO:	32:06	Not necessarily the treatment path itself. Is that--
NA:	32:09	I think that's fair. Others have picked up on our work and used it to develop treatments. But I think our focus was always on the understanding, not as much on the translating, although we were involved in that too.
JO:	32:24	Yeah. We need to be able to identify what's going on in order to treat it.
NA:		Yes. Yes.
JO:		That makes sense. And I believe that you decided to close down your lab or to cease doing research before your dean, your term as dean was finished.
NA:		Yes.
JO:		And I think I read that maybe that had something to do with the funding climate or--can you talk a little bit about the decisions that went into that?
NA:	32:51	Yeah. So I stopped taking new people into my lab around the time I started my second five-year term, because it takes a while for people to finish their work and go on to whatever else they're going to do. And so I very deliberately started to, or stopped taking people and let the lab get smaller and smaller until we eventually closed. I knew I wanted it to close before I finished as dean--my second term. But there was no particular

deadline or a particular date. I also stopped applying for grants at the same time and just let the things that I had finish. I think that the main reasons for that were first--and actually they all have pretty similar weight. But the first one that comes to mind is I wanted flexibility after I finished so that if I went and did something completely different I wouldn't have to worry about moving people in my lab or having a graduate student who was halfway through have to figure out how they were going to finish.

NA: 34:06 Second reason was the funding climate, not so much for me personally because we were able to get the funding we needed to do our work, but thinking that just generally I had other things I could do, but young people starting out needed the funding more than I did. And so making it available on a small level by not taking it myself. And then the third thing I think is I've seen some scientists who try to continue for too long and their work just isn't the same. And I figured I'd rather go out on a high than on a low.

JO: 34:49 Yeah. So you chose to step back from that side of things while you felt like you were still doing your best work.

NA: Yes. Or at least good enough work.

JO: Okay. And I imagine that must've been pretty emotional to leave that behind, especially since, like you said, it was a source of community, and what was that like?

NA: 35:16 It was sad, but it happened over years, not days or months. And I think that made it easier. It was still very sad and I miss it. But what I realized was that I could still think about science and suggest experiments to other people and stay in touch even if I didn't have my own lab. And so I think the last day was very sad, but having had a long time to make the decision and then let it play out helped.

JO: 35:54 Right. Yeah. Well, I have more questions about that topic, but I think I'll move on because I want to make sure that we stay within our time limits. I think I'd like to ask you next sort of about, just in general, about the things that you've achieved as dean of the medical school. I have a list of some of those.

36:27 Which you're welcome to look at it if you want.

NA: I might need notes.

JO: 36:31 But essentially I think that you were able to bring about quite a few new facilities, departments, research initiatives. Which of those--are there particular

36:51 facets of your achievements that you're most proud of or particular projects that you think, you know, “that was really great.” Like “that was, that was a big success for me.”

NA: 37:04 Well, I think the things that come to mind, I mean, the first thing that comes to mind is, any great institution is defined by its people. And I think that we brought in--during my time, I recruited 21 new department chairs, and hand picked them with a lot of help from search committees and for the most part got really outstanding people. And those are the people who shape the institution and will into the future. Also some terrific vice deans including people who hadn't really seen administration in their future but had a lot of potential and could grow into a job that gave them a new opportunities afterwards. So I think the thing I'm probably most proud of, although I can't even begin to take credit for it by myself, is that the group of people that we managed to assemble, and terrific faculty members, terrific students also recruited during that time.

NA: 38:19 I think the things that were especially fun, included--and this is one of those things that would have been really, really challenging at Harvard but was not here--we started, in around 2010, 2011 as a pilot, and then we went straight into doing it full force--we started a program called the primary care leadership track, which is a small part of the medical school class. Students who self-select as they're applying because they're interested in becoming leaders in community health and finding new ways to improve community health. So that was wonderful to see that go from being an idea--probably around the time I came I started thinking about it--but really grow into a mature idea around 2009, 2010 and then take off as a program a couple of years later. Another educational program that I think has turned out better than I ever imagined is something we call the masters in Biomedical Sciences.

39:39 And the original idea was to have a masters degree program for students who had done science in college but didn't need to do a PhD in order to do whatever they wanted to do for their career. It morphed as it developed into something a little bit different, although that's still a major theme. And what it turned out to be is a sort of launching pad for students who wanted to go into the health professions, medical school, dental school, physical therapy, physician assistant programs, and--but

didn't have as much foundation as they needed and needed either to improve grades or to get more experience or to get more familiarity with health professions. And that program has turned out to be a wonderful way to help students who otherwise might not have made it into what they wanted to do.

NA: 40:46 Have that extra boost in order to do it.

JO: So you've been happy with some of these opportunities to structure new paths in some of these programs that are helping people adapt—that are adapting to people's needs as those needs are changing.

NA: Yes. And another--that reminds me of another—and, by the way, for all I know there are problems with those programs now. I haven't kept up. But at least at the time I stepped down, they were thriving and doing very, very well. Another area was in trying to help our faculty as well as our students reach their full potential. And so we invested quite a bit into our office for faculty and their offerings in terms of grant writing programs and leadership courses and mentoring possibilities and so on, and really expanded a lot what that office does. Made it--changed it from being just a place where there were a few offerings but mostly administrative management of faculty to really being a resource for helping people make the most of their careers, and that was a lot of fun.

JO: 42:16 Okay. Yeah. So that office also became a hub for professional development opportunities and training.

NA: 42:23 Yes. Yes. In a way that I think we went further than most or possibly all of our peer institutions in really investing in helping make our faculty the best they could be.

JO: 42:40 Yeah. What kind of results did you see based on that?

NA: 42:44 Well, it's hard to say that there are great short term metrics. I mean we saw things like people's success at getting grants improved and people's confidence in starting their--particularly young people's confidence in starting their own research group and managing their own research group probably improved, but they're mostly pretty squishy metrics.

JO: 43:13 Yeah. Kind of anecdotal evidence.

NA: 43:15 A lot of great feedback, which was good.

JO:	43:19	Okay. Yeah. And I could see how that sort of investment in faculty could help address one of those deficiencies that you saw when you first came here and just sort of like the way that Duke Medical Center looked at itself.
NA:		Yes.
JO:		How have you seen that change?
NA:	43:41	It's hard to say. It's hard to see change from the inside. I think you'd have to ask someone who was here before and then just came back.
JO:	43:51	Yeah. Well, maybe that's a question for the new dean.
NA:	44:00	Although she was here, she was our chair of medicine for six or seven years before she became dean. So, but she might still have a perspective.
JO:	44:10	Yeah. Is there anything that you really wish you could have accomplished here that didn't--just wasn't in the cards?
NA:	44:20	You know, I think there was never enough money to do everything we wanted, and if it weren't for the economic downturn and if we had had better resources, I mean everyone always wants that, I think there's more we might have done in developing new programs and in recruiting faculty members. We generally recruited a junior level. It's less expensive. So it makes it very important to help nurture people as they started in their careers. Some of our peer schools recruit much more at a mid level or at a senior level where you know what you're getting because, or you have a better sense of what you're getting because people have already got track records and developed their careers. I think it would have been good to do some more of that kind of recruiting if we had had the resources.
NA:	45:19	But it wasn't going to happen. But we managed I think to do some really interesting things on a shoe string budget or what felt like a shoestring budget. One of those, and this is another thing that I really enjoy, have enjoyed watching develop, is a partnership with the School of Engineering. It was one of the lost opportunities I saw at Harvard was, although it has many great schools, they don't collaborate with each other very much and that, we call it MedX. That was actually a name suggested by a biomedical engineering student. That program is one of a number of ways we tried to reach out to other schools at the

university and really they had limited resources. We had limited resources, couldn't put a lot of money into it, but by making a deliberate choice to work together, we managed to get some synergies and start some new exciting things. So one of the lessons I learned was that in contrast to Harvard where I had a lot of resources to invest, here we could do really interesting things without spending nearly as much money. Which is always good.

JO: 46:54 When you stepped down as dean, what were the factors in that decision?

NA: I had always thought that 10 years is probably about the right amount of time. At Harvard I helped put in place a plan where department chairs would serve five year terms and then be reappointed once or twice usually--could be more than that. But the idea was that two five year terms is probably about right. I did the same thing when I came here. The chairs were all appointed on five year terms with the expectation that 10 years or maybe 15 years would probably be right. I think it's really important to refresh leadership. And so I came in with that philosophy, and it wouldn't have made any sense not to stick to it myself. And I think that all of the reasons I thought that was the right thing for department chairs also applied to deans. And so I had never intended to go any longer than 10 years.

JO: 48:05 Okay. So it was already planned that way.

NA: 48:09 I think it's best for institutions to have that kind of turnover.

JO: 48:12 Yeah. And what would you like to contribute to Duke going forward?

NA: 48:21 Well, you know, I think that I want--the first big priority is, and I think this has worked, not to do anything that in any way compromises Mary Klotman's leadership. You know, I don't want to have people come to me instead of going to her if they have something they should go to her about. I don't want to say to her, "you should do this or you should do that." So I've kept way back. That's part of the reason my offices is in this building. But at the same time, I can help with the long term issues that I mentioned before, in a sense, helping the faculty get more recognition, helping in recruiting, as Mary would like me to, or as department chairs would like me to, helping young people get off to as strong a start as possible in their careers. And those are the kinds of things that, you know, anybody can do in a way, but I have a little more leverage to do those things as a former dean.

JO: 49:36 Yeah. And what about outside of Duke in your research field and in academic medicine more broadly? Do you have any plans for what your activities will be, can you describe what they are?

NA: 49:51 Yes, so I enlarged my portfolio of external activities that are all in some way related to my career as at Duke and before. So there's kind of a long list--I mean, I travel a lot--but have all been fun for me and I think, mostly indirectly, occasionally directly, helpful to Duke. So in no particular order, I've been very involved with two of the three national academies: the National Academy of Medicine, which is an obvious link and National Academy of Sciences, which is also pretty obviously related to what we do here. I'm a member of both. I'm on the Council for the National Academy of Medicine. I've been very involved in member selection for the National Academy of Sciences over the last couple of years and also contributing to two committees through the National Academies, one on women in science, engineering and medicine. Again, avery natural fit. And another on helping young scientists get their careers going and have opportunities.

51:16 Again, something I've been interested in for a long time. I'm currently the chair of the board of another honorary organization not based in Washington but based in the Boston area called the American Academy of Arts and Sciences. And that's a bit different because although it does include people in medicine and science it also includes people in the arts and in journalism and in public life in various ways, CEOs of companies, and the full academic spectrum, not just science and medicine, but English and philosophy and history. So it's made up of both academics and non-academics. And I've been on the board of that organization now for five and a half years. I've been chair of the board for a year and a half. And so that is advantageous to Duke in that I can make connections for Duke up there. And I have. I can make suggestions for Duke faculty members who might be electable to get into that organization.

52:31 And I can't interfere with the elections but I can help give insight into what the academy is looking for. Also in the Boston area, I'm on the corporation, which is the equivalent of the board of trustees, for MIT. And so I get to see that very different institution from the inside and you know, I think that's been helpful, in that they do things in very different ways, and I can bring those back and make suggestions here for things we might try. And it's been fun to reconnect with MIT after a long history going back to when I was getting my PhD. And then I've also been until recently the chair of the board of directors, and I

have one more year on the board, for the Burroughs Wellcome Fund, which is a philanthropic organization based here in RTP

NA: 53:37 that gives funding for biomedical research mostly for young people. Again, that sweet spot for my interests. And during my time as chair, we developed a program of giving 2.5 million dollar grants to institutions to help them think about creative ways of increasing the number of physician scientists. And we had 92 applications for the first round. I recused myself from the evaluation of Duke's application, but Duke was one of five institutions that got the award. And we're doing a second round of it now. And then, I may be forgetting something, but the other thing that comes to mind is I'm also on the board of directors of a pharmaceutical company, Novartis, which makes many medicines. And that's been a great experience to learn about how, from an inside look at the company, learn about how you go from having a scientific discovery to having a pill or an injection that actually makes people better. And so that's also been great fun.

JO: 54:59 Wow, that's so interesting. So you really have a hand in things outside of just academic medicine.

NA: Yes.

JO: You're involved in sort of the private sphere of medicine, of pharmaceuticals, and also in sort of academia and academic leadership outside of medicine as well. Is that fair to say?

NA: 55:27 Yes. Which is fun because medicine and biomedical science are great, but there's more to the world, and it's nice to be able to have some influence in other areas as well.

JO: 55:42 Yeah. That's so interesting. So if there were a researcher coming back to this interview, who was looking for insights into your time as dean, is there anything else that you would want that person to know that we haven't covered?

NA: 56:00 Oh, I think the main thing is it's a huge job, but I was very fortunate that I had a team of vice deans and associate and assistant deans, although primarily the vice deans and some other very senior people—our chief diversity officer. Our communications director--who made it a lot easier for me to oversee this huge organization and brought ideas and energy that went way beyond what I would have come up with on my own. So I think what at the end of the day made it both doable and rewarding was having great people to work with.

JO: Well, thank you again for being willing to do these interviews. I really enjoyed it. I'll stop the recorder if you're comfortable with that.

NA: Sounds good.