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OBY: From the campus of Harvard Medical School, this is *Think Research,* a podcast devoted to the stories behind clinical research. I'm Oby.

BRENDAN: And I'm Brendan. And we are your hosts. *Think Research* is brought to you by Harvard Catalyst, Harvard University's Clinical and Translational Science Center.

OBY: And by NCATS, the National Center for Advancing Translational Sciences.

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For Jane Wilkinson, life has always been about science. Wanting to understand a genetic disorder throughout her family history led gene to an interest in science and biology. That brought her to the Human Genome Project and around the world.

Now, as the Senior Director of Project and Alliance Management at the Broad Institute, Jane oversees genomics research among a vast number of external groups and understands the key importance of team science.

Hi, Jane. Thank you for joining us this morning.

JANE WILKINSON: Thank you for having me. I'm really looking forward to our conversation.

OBY: How are you holding up with everything?

JANE WILKINSON: Yeah, it's a very interesting time. You know, unprecedented times come for unprecedented challenges, where keeping focused on genomics and our biomarker work. And we're also taking on a lot of extra COVID research and also COVID testing at the Broad. So, you know, we're really kind of trying to make a difference in this really very challenging time.

OBY: So you are the Senior Director of the Genomics Platform Project and Alliance Management. Can you tell us about what you do at the Broad and what alliance management is?

JANE WILKINSON: Yes, so what I kind of do on a kind of day to day, month by month, year by year basis-- I've been at the Broad for 18 years-- is I'm pretty much externally facing. So I am helping, working with, and also helping folks to navigate the genomics platform outside of the Broad.

So we have all of our capabilities are open to people outside of the Broad. Sometimes they're partnerships. Sometimes they're real alliances. Sometimes they're research collaboration. But then, sometimes, they're really very transactional. You know, people come to us looking for a fee for service relationship regarding the genomics platform.

So I kind of oversee all of those different types of relationships. And then I lead a team of project managers-- an amazing group of ladies who are managing all of the logistics and the more kind of day to day relationships on the projects as well.

OBY: So you've been at the Broad for 18 years now. And before that, you worked on Chromosome 1 at the Human Genome Project. Can you tell us about your early career and how you became involved with the Human Genome Project?

JANE WILKINSON: Yeah. My background is in genetics and microbiology. And I was at the University of Liverpool. I was a research technician there.

[INTERPOSING VOICES]

JANE WILKINSON: You know, they didn't even have a logo then. It was literally just, you know, a little small ad in the back of-- in the jobs pages in the New Scientist Magazine. You know, this was back when we actually had jobs advertised on paper.

OBY: [LAUGHS]

JANE WILKINSON: And I was like, oh, that's interesting! So I threw my CV in to them. Because I was actually looking to relocate to Cambridge, to the UK. And had an interview with them within a couple of weeks.

And during my interview, my boss to be at the Sanger, Dr. Mary Burkes who was another one of my amazing mentors-- walked me through the fluorescent sequencing technology. I've done a lot of radioactive sequencing. You know, this new ADI machine where you could load 20--

Actually, I think it was 12 fragments of DNA at once using the fluorescent dideoxy sequencing technology. And I was just blown away to see this huge leap before me, from radioactive sequencing to this new wave of sequencing technologies.

I got the job. I took the job, and I moved to Cambridge, UK. And I started working on the nematode project, which was the first multicellular organism ever to be sequenced. And that was a collaboration between the Sanger Center and Washington University in Saint Louis. And that's really kind of how I got involved in what was then high throughput sequencing.

And then came along the Human Genome Project. Which, again, the Sanger Center was a huge contributor to. And I went on to lead the Chromosome 1 initiative for the Human Genome Project. Because how the Human Genome Project was organized is basically the chromosomes were assigned to different research institutes across the world.

OBY: That's amazing. And could we even step back? Could you tell us how you became interested in science. I know you talked a little bit about your background leading up to the Human Genome Project. But even before that.

JANE WILKINSON: Yeah, you know, I've always had a natural curiosity to science and technology. I can actually remember, as a kid, I actually wanted to be a clinical pathologist. I wanted to do post-mortem work. And I'm not sure if you will remember there was a show called Quincy MD.

OBY: Yes, I do. I'm old enough to remember.

JANE WILKINSON: Thank you for that. And that's really kind of what drew me into biology and medicine as a field. But you know, I really didn't want to go to medical school. But that's what's really kind of pulled me into biology.

Biology classes in high school were probably my favorite topic. There was just kind of like a natural curiosity there. Genetics in particular was something that is very important to me. Both my parents are profoundly deaf, and both from genetic disorders, and we have a hearing loss that runs all the way through our family.

So that's also something that's kind of pulled me into the field of genetics as well, that kind of close to home feeling with it.

OBY: Right. How did your experience in the Human Genome Project influence how you approach team science?

JANE WILKINSON: Well, the Human Genome Project was team science. You know, as I mentioned, we literally chopped up the genome chromosome by chromosome and then assigned it to different research centers in different countries around the world. It was just a huge global effort. It was very, very collaborative.

You know, we were sharing-- constantly sharing ideas and thoughts around some of the new technologies that were coming in. We were all constantly thinking about how to scale up and also how to reduce cost as well. It was a very global effort.

When we used to attend the global calls and some of the global meetings, we used to all catch up at Coast Ben Harbor at the Biology of Genomes every year. It really was a very collaborative project.

My real first taste of real kind of big scale collaboration was actually on the nematode project. We worked with Washington University on that. But we didn't do it chromosome by chromosome. We were literally chopping it up cosmid by cosmid. So we would-- you know, we'd have a chunk of a genome, a chunk of the region. But we'd be constantly bumping into the next region, and we'd be always chatting with Wash. U. on that. So that collaboration has always been there since the beginning.

OBY: You know, I jumped into ask you about team science. But I may actually want to take a step back and talk a little bit more about team science and what that means. And, you know, I think some of it is kind of intuitive by the words. But what does that mean to you? And what does that look like? How is that different from just being a collaborator or being engaged with other groups?

JANE WILKINSON: Yeah, I mean, if I bring it closer to home and close to where we are today, you know, the genomics platform is-- actually, I should publicly correct myself-- was a team of 125 people. And we're one of the largest genomic sciences in the world.

And about 125 people, include everybody from folks who are working in the lab to people who are building and maintaining our laboratory information management system. We have a quality assurance team. We have a leadership team. We have a team of project managers.

You know, there are so many components to genomics. You know, one of my favorite sayings is it takes a village to sequence a genome. It absolutely does. It really does take this infrastructure of a lot of people with a lot of different expertise, different focuses, in a kind of minute by minute way, but then all coming together and focusing on the output of the genetics group.

And the team has actually grown rapidly since the-- since the COVID-19 pandemic. We've actually hired about another 100 people to take on the COVID testing work that we've been doing as well.

I will also say that team science now is even more important than it ever has been, because we are all-- most of us are remote. We have our lab folks who are back in the building. But most of us, like me, are working remotely. I'm sitting in my dining room at home, focusing on-- working hard at maintaining that team focus is really important, more so now than it ever has been.

OBY: What keeps you motivated in your job at the Broad after 18 years?

JANE WILKINSON: I have a saying that working at the Broad is a bit like New England weather. If you don't like it, just wait a minute, because it's going to change.

It's a very dynamic organization. You know, what I love about the Broad is that-- it's pretty unique. It's a combination-- you know, with the genomics platform, we really were a real business hat a lot of the times, because we do apply a lot of lean manufacturing techniques to our genomics philosophy.

So sometimes it feels very business and very kind of production driven. But then I have these collaborations that are inside the Broad. I have collaborated outside the Broad. The technology has constantly changed. My role has evolved a lot.

You know, I haven't had the same job for 18 years. A new challenge comes along, and I kind of take hold of it and run with it. Because it's a very fast paced environment, though, I have a lot of opportunities. And that's really what kind of motivates me. I'm also the type of person who likes to keep super busy, and there's plenty of things to keep you busy at the Broad.

I love the mission at the road-- you know, that kind of elevator talk that they tell you to think up. I love it when I go to, you know, a random holiday party and somebody asks me, well what do you do? You know that 30 second summary that I give that person who doesn't know anything about the Broad or, really, genomics, every time I give that I'm like, oh, wow, I really do have a really cool job, and I'm really making a difference here.

And I think it's important for us all to do that once in a while. Take a step back and tell yourself about your job and tell yourself what it is about your job and your career that you enjoy. And it's a good reminder.

I also work with some of the world's smartest people. I also have a saying that I often share with my mentees. I do a lot of mentoring within the Broad and outside of the Broad. Where somebody once told me that, the day you become the smartest person in the room is that day you should leave your job.

And fortunately, that's never the case at the Broad. I'm surrounded by some just amazing, brilliant minds. And they're constantly inspiring me and constantly teaching me and pushing me to learn more about myself and also about science.

OBY: That is-- I'm going to take your analogy about New England weather. I felt that deeply. It's spot on.

JANE WILKINSON: Yeah. And also, I mean, if you think about it, some of the kind of major projects I've worked with at the Broad, I came back to the Broad to see out end of the Human Genome Project. I took on some of the next organism-based projects-- the mouse, the dog. Then genomics really started to diversify away from model organisms into infectious diseases. And then we started doing some cancer research.

And now we're looking at these immensely large scale population cohorts. The types of genomics have changed so much over 18 years, as well, and that's really been a motivation too.

OBY: Can you talk about some of the work that the Broad is doing now to understand COVID-19?

JANE WILKINSON: I mean, it's just an incredible effort. You know, it's one of those things where I kind of stop and pause and I catch my breath on it. It really has been just an incredible initiative.

This came about with a conversation with Broad leadership just as the pandemic started to break in Massachusetts and we started to see our numbers really start to increase. Obviously, we'd gone into lockdown, and the genomics lab was closed. But the Broad leadership really wanted to come together and see how they could contribute and help the Commonwealth of Massachusetts with the testing capacity. There was such a shortage of testing at the time.

So we converted over a bunch of the labs at our sequencing facility, at 320 Charles Street, to become what was then a large scale COVID-19 testing facility. And we were planning on getting up to about 2,500 samples a day. Which, you know, back in March was absolutely mind blowing.

We pulled this together. We already were a CLIA Certified lab. So that was very much the first easiest step to take. We became certified in March.

OBY: Clear Certified?

JANE WILKINSON: Sorry?

OBY: I'm sorry, did you say Clear Certified?

JANE WILKINSON: Yes, CLIA Certified. C-L-I-A.

OBY: What does that mean?

JANE WILKINSON: So that's a clinical certification, and that allows us to perform testing on patient samples and for it to potentially impact their treatment and outcome.

We got the lab up and running and at a capacity of 2,000 tests a day. And we were also very focused on doing a fast turnaround time-- understanding the importance of getting these data back to the patients and the care providers very quickly.

You know, some of the first projects that we became involved with-- and we were working very, very closely with the Baker and Polito administration, and the response command center on this-- we took on a number of initiatives with the Departments of Public Health in Massachusetts and also with MGH and Brigham and Women's.

We were helping out with some of the nursing home testing. We were helping out with generating extra capacity for some of the other testing labs throughout Massachusetts. So we could kind of scale up. It was just incredible to see us go from 0 to 2,000 tests within a matter of weeks in March.

And, you know, and now here we are in July. We're now going to-- we're now at the capability of doing 35,000 tests a day.

OBY: Wow.

JANE WILKINSON: And it's just incredible to see us going from 3,000 to 35,000 in just a matter of months. The demand is very much there. There's a huge demand for COVID testing.

And we're really also very focused in making sure that we're really kind of contributing to the community on this initiative. We've been working with the Department of Public Health here in Massachusetts to stand up some new testing facilities, including some that are called Stop the Spread. And though we're opening up these test facilities in hot spots around Massachusetts, still working with some of the nursing homes and those care facilities as well, but really making sure that we're also able to contribute to some of the underserved populations and underserved areas in Massachusetts to bring testing capabilities to them.

We'll also be working with a lot of New England schools and colleges as well in providing then some back to school testing as well.

OBY: And so what has it been like working at the Broad during this pandemic?

JANE WILKINSON: Well, you know, go back to the New England weather comment. It's just constantly, constantly moving. It's kind of interesting. You know, at Genomics Project, you know, taking on a large scale population study looking at a big cohort in a population of people that may have a psychiatric disease, those types of projects take months to kind of come together.

You know, lots of IRBs and concerns and lots of upfront paperwork. And then there's months and months of sequencing. And then months and months of analysis.

With COVID testing, we're really in a start to finish timeline of 24 hours. So it's a completely different shift in timing and the sense of urgency. But we still have both with those efforts going on. Our genomics lab was back up and running in June. So we are doing our genomics work and our biomarker discovery work there as well as the COVID testing.

I'm actually involved in both sides of those. I have a foot in each world at the moment. And I'm actually really enjoying the different challenges that they both bring. I'm enjoying being part of the COVID initiative, and I'm also enjoying the different types of challenges that come with that.

But I'm also still very grounded with the genomics projects, which was really my passion and what got me into this field to start out with.

We're also getting involved in COVID research as well. So, you know, up until now, I've spoken a lot about COVID testing. There's a lot of work going on at the Broad to really kind of understand the mechanism and the genetics behind COVID-19.

I've been talking to some collaborators who are interested and looking at the whole genomes of COVID patients. This is something that makes these particular people most susceptible to particular outcomes.

There's a really, really interesting project in the UK called the UK biobank. And they've sequenced hundreds of thousands of people in the UK. And they have their genomes on file. They've already been sequenced. But because the UK has a really good EMR system-- Electronic Medical Records system-- now they can go back and say, OK, who are these people that we have already sequenced, and we've already met the genome for, have COVID 19?

So they're able to-- instead of waiting to generate the genomic data, they already have it. But they're using this new-- the new medical data that's coming in from the COVID-9 diagnosis to look at these people as a cohort and to try and understand more about what it is that makes them susceptible, if there is something that makes them more susceptible than others.

We also have similar projects like that at the Broad. Dr. Ben Neale is leading a study at the Broad where he's going to be looking at large cohorts of COVID-19 patients.

OBY: Thank you so much for joining us, Jane. It has been a pleasure to have this conversation with you.

JANE WILKINSON: It's been so much fun to actually just take a couple of minutes out of where we are in the world right now and look back, and also think forward, about genomics and my career. And I'm just really, really glad that I could share this story with people.

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OBY: To learn more about the guests on this episode, visit our website, catalyst.harvard.edu/thinkresearch.