00:00 **They really appreciate it.**

Yes, of course, no problem.

OK, so I'm going to start off by asking so I'm kind of getting to know your questions.

Sure.

Followed by some questions regarding collaboration and finish off with some stuff about you.

OK.

And I apologize if any of the questions or stuff that you answered on the air may. Well, that's recorded.

Yeah. Understood.

OK, great. So to start off with, what kind of research do you do currently?

00:29 I do microbiology and computational microbiology.

OK, and what is the goal of your work?

The goal is to understand horizontal gene transfer in microbes that are associated with cheese.

OK, and so what is like the potential impact of your work on your society?

Well, we're really trying to understand the fundamental mechanisms of complex microbial community interactions.

00:57 So this is a model system for understanding these communities, which are then important in lots of other places like <redacted>. So, for example, the human gut microbiome is complex microbial community, but it's very difficult to study. There's also microbial communities in the soil, in the oceans. And all of these communities are really important for various features of the environment or for human health or for agriculture and these sorts of things.

01:27 So the same way that we study fruit flies, say to understand genetics, that has impacts on human genetics and our understanding of human disease. The idea is that understanding these complex microbial communities in an environment that's easy to study will allow us to then understand sort of principles that we can then apply to other more difficult situations.

OK, great. So then kind of moving onto the questions regarding collaboration, what is the average number of researchers on the projects that you have worked on in the current project?

02:02 Well, we haven't actually published anything. So I mean, right now we probably have. Are you coming like the <redacted> or just other labs or like everyone that's involved? So that includes, you know, anybody, that wouldn't necessarily be listed as, listed on the paper as a private.

Oh, I see. OK, so in that case would be probably on the order of six to eight.

02:31 **OK, great. And then just like historically on all of your projects and you give me like a rough average.**

That's probably yeah. I would say five to 10. I think my graduate work there were probably 10, 10 people.

And so I want to like, I'm going to kind of ask this question, like both generally and with regards to your current project.

02:59 **So you can't project what is your role in the research?**

I'm the lead researcher, so I'm writing computer code. I'm doing some bench experiments. I'm sort of I'm going to be doing the writing for the paper that we eventually do their interpretation, sort of plotting the course of the project. So what experiments are important to do is answer your question. Yeah, totally <redacted>.

03:29 **I am writing like some notes down so that I can refer to it right there. And I'm not a very fast writer, which is OK, I'm sorry. In general, what kind of role do you play in the projects that you've worked on?**

Similar things are deciding the course of the project, actually doing the experiments. So I'm a postdoc now, so and when I was a graduate student was the same thing.

03:56 So, you know, designing experiments, doing the experiments, deciding on project direction and then also writing up the results and interpreting data and things like that.

OK, great. I'm asking that because I want to be able to put your later questions into kind of like context. I'm talking to people who do different kinds of writing parts.

04:18 **OK, so with regards to size of projects, erm are there any challenges or disadvantages associated with working on projects where there's a smaller number of collaborators for the sorts of questions that we're asking now?**

I would say not really. I mean in general, having other collaborators, when there is some sort of expertise that you don't have, being able to reach out to a collaborator that does have that expertise is obviously really valuable.

04:55 And that's what happened in my graduate work. That's the collaborators we. Had there were people who did the things that we didn't know how to do or not to do well and I think yeah, so right now the projects that we're working on don't have a lot of components that we don't know how to do. Or in the case of my current project, the bioinformatics was something I didn't know how to do, but I wanted to learn.

05:24 So it was useful for me to do what I must do it myself.

OK, and then are there any benefits to having small numbers, small groups?

Yeah. I mean, it's easier to sort of keep focus and sort of control the direction, follow your own interests if you're in a bigger group, I think you could sort of get become a slave to the will of the group rather than being able to sort of do your own thing.

OK.

05:53 **Are there any additional challenges to working in larger groups?**

I don't have a ton of experience with working in large groups, so I don't know.

OK. And so and then kind of. Yeah, these are kind of like groups questions. What are roughly what percentage of your projects have involved at least one collaborator who is at another institution.

I guess 100 percent.

OK. And why did you choose to work with these collaborators again?

06:24 They had expertise that we didn't have and either I or my <redacted> I knew them.

OK, OK, great. So is there any instance where you needed to reach out to somebody that you didn't already know?

Not that I had to reach out, but in my graduate work, my PI reached out to someone that I think they had been in contact. That person had previously been in contact with my PI about something. So he knew of this person, OK ?

06:54 And so they when we thought of him.

OK, did you notice any differences when you were working with working with that person versus working with people that you knew?

We're going to the nature of the working together was different. So the answer is not really, but it's hard to say because it was just sort of like a one off thing.

OK. And are there any challenges or difficulties associated with working on projects where your collaborators are distributed?

07:28 Yes. So sometimes getting in touch with them or having people follow up with communication.

OK. Can you elaborate a little bit?

Yeah. I mean, if somebody is in close proximity, you can go directly and talk to them. Whereas if you're they're distant and you write them an email, they may not write back to you immediately.

07:49 If they're if their priorities don't line up with yours, it can be hard to sort of communicate the urgency of a request or to be on the same page about what is urgent.

And then are there any benefits?

I mean, being able to find different expertise, I think is the biggest benefit. You don't always have someone locally that knows a thing that you need.

08:19 **So, OK, great. And I mean, you mentioned that about a hundred percent of your projects have felt like somebody who was at another institution even does that even when you were like this, like further back when you were a graduate student.**

Yeah. I mean, I'm specifically thinking about my graduate work and my postdoctoral work. I guess when I was a technician before going to graduate school, the project I had, we had collaborators, but they were at the same institution.

08:52 But I can't remember if there was anybody on that project that was at a different institution. There may have been.

OK, so on your projects where you do have some people who are at another institution, are there are you working with some people who are who are co-located with you in addition?

Uh, no, no.

OK, um, OK, great.

So I mean, one of them so. So, for example, right now we have a collaborator that's at a different university, but also in the <redacted> metro area.

09:22 So he's close by and can come over to, you know, exchange reagents or whatever. Um, but yeah, they're not like in the same building or in the same lab.

OK, are there any differences between that kind of interaction versus with the people that are further away?

Oh, yeah. I mean, being able to share reagents, share strains of bacteria, having them just come pick it up rather than shipping it, it's obviously a lot more convenient.

09:52 But again, there's it's tough to say whether it's a function of them being close or if it's because he was a former postdoc in the current lab. So the relationship is closer to begin with. It's hard to say whether it's the distance that's causing the difference in interaction.

OK, so what percentage of your projects roughly involves collaborators working with collaborators who are in very different fields?

I would say a low percentage.

10:22 So we like 20 percent.

OK, are there any challenges or difficulties associated with working on those projects?

Yes. And the main difficulty is sort of being on the same page in terms of experimental questions. So it's a lot of jargon and sort of… it's not just jargon, but it's different ways of thinking about approaching a problem and communicating that because it's when you're working with people in your own field, it's not really verbalized.

11:00 It's not a sort of explicit difference in thinking. So figuring out how to communicate and sometimes you can use the same words with a person and have it mean something different because of your

field. So, you know, crossing those, figuring out that there is a communication barrier and also getting around that barrier can both be complicated.

So how do you how do you approach solving that problem?

11:34 Lots of talking and using clarifying words and questions, sort of, you know, being very explicit about what you're looking for and asking to see if the other person is on the same page and sort of, you know, doing lots of back and forth.

Are there any benefits to working with collaborators in different fields?

12:00 Yeah, I think it's important to have to get different perspectives on a question. I mean, not just that problem of having different ways of looking at a problem or having different approaches to a thing can often be really valuable. I mean, even though it's hard to get to get around it, having different perspectives on experimental questions is usually valuable because some a lot of times the approach you're thinking of doesn't work or it has issues that you can't see because of your own biases and stuff.

12:32 **OK. So for that other 80 percent of projects, are there any challenges to working with collaborators who are all in the same field as you?**

Yeah, I guess sort of the opposite of what I just mentioned, which is tunnel blindness. You know, you can get stuck on a certain problem and not realize that there's a different approach because everybody sort of has the same background.

13:02 **Yeah, I apologize to some of my questions are like... Really?**

Yeah. Yeah. No, I totally understand the data.

And then what are the benefits to working with everybody in the same field?

The communication is really easy. You all speak the same language. You don't spend a lot of time sort of making sure everybody understands because it's usually pretty clear. So, again, sort of the benefits and the downsides are sort of directly opposite to the working with people outside your field.

13:37 **OK, so about how frequently do you meet with your collaborators when you're working on a project in person just and not just in person, but so do you like would you consider like an email to be meeting with them or.**

Um, I would say something a little bit more group like a Skype or something like that.

14:04 So in that case, maybe once every month or two.

OK, and does the frequency at which you meet change due to the size of the group or the disciplines of people that are back?

I don't know if I have enough experience to really say that's fine.

14:32 **We read a paper that like said something about the size of groups and things like that.**

Yeah, I understand. I just it's hard to dissociate the size from just the particulars of interactions.

Like I said, you know, persons in town and used to work in the same lab and still at least I have a lot of projects that are like.

14:59 Along the same lines and her close collaborators, but it's hard to say if it's because of those factors or if it's because of the size of the leak of the number of collaborators. I mean, yeah, I do.

So do you have like one like another like kind of tricky question, I guess, along those lines we need to ask it.

Sure.

Do you think… what do you think has the biggest impact on the outcome of a project, the size or the discipline?

15:28 That's a tough question. I think it's really conditional. OK, can you say the question again, the wording?

What do you think has the biggest impact on the outcome of a project, the look or the size of the group or the background, the people who are in the group?

15:59 The outcome? Do you mean success or failure or do you mean like the direction of success or failure?

Well, success or failure and then go on to direction.

I would say that for now, and that is a tough question for really complex projects. The I think there's probably a sweet spot in terms of size.

16:29 You need enough collaborators that you can effectively address all of the experimental questions you have, the sort of broad expertise that you need, but not so big that it becomes sort of unwieldly from an organizational standpoint. I don't have direct experience with this, but I've heard stories of, you know, you have 30 people that I'll need to sign off on a paper and waiting months just to get your back from people that haven't read it or things like that.

17:05 So that can cause big delays. And in terms of different expertise, I think I think that's far more conditional. I think there's there less in it. Depending on the project. Having people with different expertise might cause problems or it might be the key to the success of it.

So, OK, and what is that sweet spot for its size?

Like, you want a number?

17:33 **Yeah, like a rough estimate.**

More than two. Less than 100. So it's been I mean, I think greater than 10 probably gets starts to get a little bit unwieldy. OK, if if all of those people are in terms of collaboration of all of those people are actually important making decisions, you know, if you're just asking for like one off experiment and they do a thing and then get it back to you, but you don't have that sort of consult with them for each step of the project, that's I'm talking about people that are directly involved.

18:10 **OK. Have you ever had a project fail because of collaboration issues?**

No.

OK, great. OK, so you've mentioned quite a few say tasks or aspects to you to working on these projects. So kind of starting with plotting the course of a project, is that something that you do by yourself or something that you collaborate with another researcher to do?

18:41 I'm usually collaborating with PI on that.

OK, and what tools or methods or technology used to accomplish that task?

Mostly in-person meetings and email.

OK, so when do you do an in-person meeting versus email in person?

When we're both in the same place, an email that I mean.

19:08 So in my current project, for example, I'm working in two different locations. So, and because it's a computational project I'm using on the computers, I can do the work from two different locations. So when we're not in the same building, I'll use email. Or if she's if I'm working late or early and she's not in and I have a thought, I'll send an email. But if she's in the lab, then, you know, then we'll chat.

19:38 **OK, so what is the benefit to talk to you in person over email?**

Quicker back and forth, I guess the speed of communication. So if there's something that isn't understood or if there's a response, it comes immediately and so you can follow up immediately.

OK. And then are there any times you would choose to use email over talking in person through email?

20:12 I can't think of one.

And then do you ever use any other technology like Skype or teleconferencing to accomplish this task?

Yes, OK. Which means things like Skype. So Google Hangouts. I think we tried using whatever the Apple version of that is this time, once it doesn't really matter and they'll sort of accomplish the same thing.

20:45 We also use Trello, OK, which is I don't know if you know it. It's like a voice over. No, it's I don't know, maybe this is for a different for a different question, but it's sort of like an organizational framework. So it's a web app where you have like lists of tasks and you can sort of write things down and have checklists and different sort of organizational structure.

21:14 **So sorry.**

Oh, no, it's OK. So we like when we plot out the direction of the thing, we sort of like lay it out in Trello and have certain tasks that are associated with it. And you can put comments on those and things and like Mark when they're done. So that's another area.

OK, so why do you use Trello specifically over any alternatives?

Just because it was a thing that I found and it seemed to work OK.

21:42 **Have you ever had any problems or issues?**

Yeah, these like the learning curve is a little bit steep. So you figuring out how to learn it effectively as a kind of an issue. But I mean, that's not uncommon with trying to figure out a different way of organizing information.

OK, so what did you do to overcome that?

22:10 Um, I think I watched some tutorial videos and just also experimental experimentation. So trying some methods and seeing if they work and sort of refining.

OK, do you use Trello for any other purpose for purposes other than just plotting the course of a project?

I mean, using my personal life as well.

22:36 My wife and I have our grocery lists on there and for tasks around the house and things and for organizing my courses, I have Trello boards and so.

Yeah, OK. And are there I don't know any collaborators with who you don't use this tool with.

I would say all of my collaborators except my PI.

23:05 So I only use it with my PI.

OK, ok, great. And so kind of coming back to you, seeing things like Hang Outs and Apple's FaceTime etc, would you use those over an email or talking in person?

I would never use it over talking in person unless we were in different locations and so we couldn't meet in person ways that um, for example, over the summer my pi was up at <redacted> study cheese.

23:44 So we have some collaborators that are cheese makers. And so she was up in <redacted> for a couple of weeks and so we wanted to have a meeting and so we used that. Does that answer your question?

Yeah, that does. And so have you ever had any issues using either of those tools?

Yeah, sometimes video doesn't work or audio doesn't work.

24:14 OK, and for reasons that are unclear to me.

Right. OK, see, so you're basically you're using me to speak to people when they're at a distance.

Yes. Right.

OK, do you ever use like one specific tool like you would use to hang out with one collaborator or face time with another.

Um yeah. Well I think I've only used it with my current PI, so yeah. I don't know if I can really answer.

24:42 I mean, I can say hypothetically I would if my collaborator had a preference for one or the other.

OK, you mentioned that you kind of only tried this time like once or twice and then you're like defaulting back to hang outs.

But my personal default is hang outs. But I'm I tend to be more technically savvy than collaborators, so.

25:11 I will sort of default to whatever they're using. I think we tried hangouts because maybe I was having trouble with. We tried FaceTime because I was having problems or trouble with Hangouts. Well, I think her microphone, like, she couldn't get audio working,

OK. And then so, I mean, you're using email and you're using and, you know, things like using hangouts to speak with people who are at a distance.

25:42 **Is there hope that you would choose one technique over the other?**

You mean like use hangouts versus face time or something?

Yeah. Or using hangouts versus email.

Oh I see. Yeah. I guess having meetings for the same reason that in-person conversations you can have sort of more direct and rPId back and forth.

26:13 I think if there are I think I mostly use email for specific communication where there's like, you know, I have a particular goal or a particular question or some very specific issue, whereas the meetings are valuable for sort of general updates on the state of a project or general talk about the direction of a project.

26:42 So where there is where there are a lot more directions, where the conversation might go. I think having in-person or if you're not in the same location, having a Skype or Hangouts conversation is better than email because you can sort of deal with different threads as they come up. OK.

27:05 And so any time we would use teleconferencing or a phone call, there's no time that I can think of that. I would. Although if, you know, if again, for the same reasons that if a collaborator was not technically savvy and didn't know how to use Skype or hangouts, then a phone call would be the next best thing.

OK, so you also mentioned that you when you're working with our readers who are in different fields, there's kind of a clarification process aspect to that.

27:40 **What tools or techniques or methods used to accomplish that task?**

I guess mostly just communicating in-person communication. I guess I'd do it by email, too. I can't think of a specific reason to do one or a specific time when I've explicitly chosen one or the other. But I think just I mean, it's a matter of communication and back and forth.

28:09 So, again, you can do that more rPIdly in person, but at the same time, email can be better or sort of writing things out can be better because you can spend more time with the topic. And when it's when it's problems, where there's the sort of jargon barrier or a language barrier, sometimes in-person communication can be difficult because you can say a word and have it mean something to you and have it not be clear that it's mean something different to the other person.

28:45 But that's hard to catch an email too. I guess it's just you can reread things and email and so sometimes you can pick up on things that you might miss in person.

OK, so but can I come back to the code and doing bench work? And I'm a computer scientist, so I really have no understanding of. Well, not no.

29:11 **But a limited understanding of what that actually entails in your situation. Is that something that you're kind of doing solitarily or are you working with other people?**

Typically it's solitary. And then, I mean, like the actual act of doing the experiment is solitary. I mean, again, you sort of communicate about the direction of it with other people and collaborate on that. But individual experiments are usually solitary.

OK, what about sharing the results of your experiments?

29:43 Yeah, that's usually something that is done in collaboration. So usually with PI or other members of the lab and what tools you use to share your data, um, having them turn around and look at my computer screen or email or Google Drive or you use Google Drive over email or vice versa. But I think.

30:10 Google Drive is superior in most ways, though, if it's just sort of a one off like, hey, look at this thing, sending an email is often easier, but we try to keep most of the data in the lab in Google Drive.

OK, so can you elaborate on the superiority of Google just because it's a more permanent thing?

30:36 And if you're if you're good about organizing folder structure, then it's a little bit easier to find than using search terms in your email client. But also you can get larger files. So we deal with some like, you know, multi gigabyte files and you can do that by email or it's not practical.

OK, so when you say we'll take gigabyte, you mean like something under 10 or over 10?

31:08 **Because under 10 gigabytes, typically, although a data set might be more than 10 gigabytes. Just a curiosity.**

This is the first project.

This is the first project for you doing bioinformatics. And it's like, how far along are you in this project? Hoping to start writing this weekend and submit?

Oh, great. OK, but the beginning of next month.

31:34 **So I was going to give you a little bit of a warning, depending on your project, that you could end up with like terabytes of data using like this.**

Oh, yeah. No, I mean, we have, we have. Yeah, I, I'm aware it gets crazy that trying to deal with I mean I'm pretty stingy about data.

32:01 So if I, if I do a thing and then I decide I don't like the results, I'll usually just delete it rather than pack the data.

Right.

But we definitely have some duplications of like sequence files. And so there's probably a lot of server space that we're using that we don't actually need.

But do you ever share that data with your collaborators?

Yea

32:31 Uh, often Google Drive, although also we have a server space in <redacted>, has like a high performance computing cluster and network storage where we have, I think, like 100 terabytes of space that so we can upload to that and then use FTP and other things like although I think we're sort of transitioning to mostly use Google Drive for things.

33:04 **OK, so what is the benefit of using Google Drive versus FTP to get your stuff on the server, the user interface?**

I think, um, I have become comfortable with command line, but most of my collaborators still are not. So, um, having a sort of easy web interface or, you know, being able to download it directly to your own computer and have it mirrored for the files that you need as is valuable.

33:36 **And have you ever used something like Dropbox?**

Yeah, we had we were using Dropbox for a while, but I don't remember I don't remember. My PI made the decision to switch to Google Drive. OK, do you have maybe for the document editing functions, although Dropbox has that now. So also I think some PI just got a new job at UC San Diego and they're, I think, giving her free Google Drive like basically unlimited Google Drive storage.

34:07 **Okay. So you mentioned, um, creating documents and sharing documents. So what do you what do you use to write your documents?**

But I typically use Google Docs.

Okay. And so what's the what is the big benefit of using Google Docs over something like Microsoft Word or latex?

Um, well, latex because I haven't learned how to use latex.

34:35 Um, I had intended to at one point, but in my field we don't do a lot of mathematical sort of display. It's mostly text and then we're pasteurized or scalable vector graphic images. And so the the functions of latex for sure of print output are not as necessary in terms of use over Microsoft Word, I think.

35:10 The cloud, the direct cloud backup is nice, moist, connected to the Internet for the most part, and they have offline. So for those rare times that have not, it's a little bit less cumbersome. There's less I don't need a ton of customization. And Microsoft Word, I think, is kind of bloated with functions that they don't need.

35:36 **So. So when you're writing papers and is that can you. Is that something that you're doing when you're working? You're working with your collaborators.**

Multiple people are working on writing the paper. Typically, it's sort of for my projects. I'll write a draft and then have people sort of edit the draft.

35:58 I will say when I was a graduate student, my boss didn't really know how to use Google Drive, so I would share things with him on Google Drive and then on Google Docs, and then he would download them as word files and then do track changes in word and then send them back to me, as were documents without any difficulties or challenges. Yes. OK, so I think the one of the key benefits probably should have mentioned this earlier.

36:26 I think about it one of the nice benefits of Google Docs is the sort of version history that's really seamless and not in the way. Whereas with Microsoft Word, you know, you can do track changes. But what ends up happening is you end up with like five or 10 different versions of the document. And it's not always clear what version came when.

36:53 And if I sent him a version and then made some edits and then he made some edits and then sent those to me, sort of merging would become a problem.

Elaborate on why or how merging is an issue

and just making sure that all of the updates are contained.

37:20 So if he makes suggestions about a word change, so you either you when you're working with two different versions of a thing, you have to sort of say, OK, which version am I going to work on his track changes version or on my most recent version? And then sort of moving the changes or suggestions that he made from his version to mine is just a bigger hassle than if we were both collaborating on the same document in real time and having him make suggestions while I'm editing a different portion of the document.

37:52 So everything sort of self-contained as opposed to having multiple file versions in different places and sort of keeping track is much more complicated when you have lots of different versions running around.

And you mentioned that you would you typically write a draft and then send it out to various collaborators. How are you sending it?

He described that process. Sure.

38:19 So with my former PI who had this, who didn't know how to use Google Drive, I would say I started out just sending him a link to the Google doc, but he didn't know how to use that. So then I would send I would basically Google Drive has a has an option where it's sending as attachments. And so I would within Google Docs, I would say send an attachment and I would attach it as a word document with my current PI.

38:54 She is well versed in using Google Drive, so I will just share the document with her and give her edit permission so that she can make edits or suggestions. OK, and I apologize for to ask you this, but I you know, I'm limited to and I can take and that's I had any difficulties using Google Drive. Um, yes.

39:18 So one of the difficulties was because we have these many, many multi gigabyte files and I'm using a laptop for most of my stuff if I just use one. They had the lab drive shared with me. If I tried to download the whole if I tried to think everything, then I would immediately filled up my computer hard drive.

39:49 So sort of sorting out which folders to sync became an issue in it because of the way that I organize my folder structure. The Google Drive only gives you describe the server, the level of selectivity for downloading folders.

40:17 If you say like only download certain folders, you can only choose top level folders. So in other words, you know, in my in my normal Google Drive structure, I have personal works and web are my top level drives. And so.

40:38 My all of my work stuff for the courses that I teach, etc., as in my work folder and my lab drive was also in my work folder, but if I wanted to download all of my courses, then it would also try to download the entire lab, drive my car. So I had do sort of work with like folder aliases and stuff like that to organize.

41:10 And so I could sort of selectively download only the things that I want to do and figuring out how to do that was kind of a pen name.

OK, so and then when you do interpreting data as a kind of a solitary activity or.

Um, I think both. I think usually since I'm the first person to see the data, I will do my own interpretation. And then for things that I think are important, I will share that.

41:40 And then some additional interpretation is done with PI.

That makes sense.

Yeah. So sorry. Didn't you know that was it.

OK. So and then so you're sharing, you're sharing your data right. With your PI to discuss it and you're using the tools that we've already talked about.

Right. Right.

Right. OK.

42:09 **And then when you're working with your to do additional interpretation, how, what techniques or methods or tools or how is it how is that going?**

It's usually in person or over email. So it's either you know, I'm showing an image. If I've generated a graph or a plot, I've got the image. If she's in the lab, I'll just have her come over to my computer and look at it or and or I will email it or put it on the Google Drive and send a link.

42:41 **OK. So when do you do. Which are fairly arbitrary.**

I think there's a lot of there's a lot of iteration to how a piece of data is put together. So I'm usually not sharing raw data. So I'm usually not sharing like a spreadsheet, usually sharing a sort of somewhat interpreted data.

43:15 So a graph or of an image. And so if it's something that I think is going to be sort of close to a final version or is a final version, then that will go into the Google Drive. If it's something we're sort of like still iterating on or if it's just like a sort of in process, then it'll usually be an email. OK, just because that's faster.

43:47 And the thing that I was mentioning about the problem of email, which is like going back and finding it, if it's just one step along the process, then it's not super important to be able to go back and find it. OK. So I think maybe email just feels faster than uploading to the drive.

OK, I had a question I forgot to ask. Refers to data sharing.

Sure.

So like who in your collaboration and your collaborative group are you sharing your data with?

44:19 **Is it just like with the people who are specifically in your lab or generally?**

Yes. OK, um, yeah, because well, I mean, it depends on the particular thing. So if it's an experiment that involves a collaborator, then the data will be shared with a collaborator. So for example, this guy that works at a different university in the same town, he's involved in certain aspects of the project and not in others.

44:52 OK, so I don't keep him abreast of every change in data interpretation, but for sort of the bigger picture and once the paper is sort of in draft form, then I will be sharing that data with him as well.

Have you ever had any concerns with regard to trust and data sharing?

I have none.

Great.

I'm of the opinion and I think I mentioned this in the AMA.

45:23 I'm of the opinion that all data should be shared with everyone all the time. And so I would be I would be comfortable making all of my data public, like as I collect it. Um, but most. All of my colleagues are not right.

Yeah, that's right.

Again, that's why I'm asking that I'm getting kind of a 50/50.

Yeah, OK. And so when you mentioned that you were learning <redacted> for <redacted> in order to do this project.

45:53 Right.

So how did she go about learning what you needed to learn?

Yeah, um, it's a good question, but I don't really remember exactly. I mean, I started with I think I used Codecademy to sort of like start learning Python, but quickly got bored with that. And then it was a matter of Googling a lot.

OK.

46:21 And I tried a couple of different tutorials. I use Rosiland info, which is a bioinformatics sort of like they have some probably code problems that are related to biology. So I started doing some of those joined the sub <redacted> Learn programming.

46:50 I don't know if I've gotten a whole lot out of that. I think a lot of it was when you stack overflow constantly. I mean, most of my Google searches and that stack overflow. And then I also have asked a lot of questions on stack overflow.

Yeah.

And I don't really know. I mean, a lot of it is sort of like, you know, reading, reading document.

47:16 In the beginning I would read documentation and not have any idea what anything meant and then I would Google certain terms. I would try some things, and then eventually it would start to become clearer. And then I'd go back and revisit the documentation and sort of try different things. And then a lot of it was just starting to try to write my code and Google and questions about specific things that I was trying to do and then playing around with trying to write it in different ways and then running it and then sort of iterating like that.

47:47 **You mentioned asking questions on Stack Overflow. Are there any other were there any other instances where you're consulting with and experts say in bioinformatics or programming?**

Um, there were a couple of things related to computing on the high performance computing cluster at <redacted>, where I would get in touch with the folks that run the cluster. They have a really great help desk.

48:16 So for some things where I was running stuff on a server, I would talk to them about it. Beyond that, I think, oh, I asked I asked one question about genome assembly on Twitter.

Really?

Yeah. I mean, I think I saw somebody who had said something or had like posted they follow a couple of people, like bound for mutations on Twitter. And so one of them said something about assembly.

48:45 We just published a paper. And so I asked him a question about it because it was on my mind directly. But yeah. OK, so when you were consulting with the people who are who are at <redacted> and again is in question, what method tools. Technology, I understand.

Yeah.

So it was they have a ticket system, OK, but then over email.

49:14 So <redacted> helped take it on the website and then they, I'm sure they have some ticket system under that. I don't know what it is, but then it's just they respond by email and then it's email communication.

OK, were there any ever any issues with that.

Not really. Oh, I think they also have office hours where you can go in and talk to them about the problem. And I used that once. Yes. And I was like, it was great.

49:45 I mean, we were all to sort out the problem. I mean, again, it's sort of like being able to iterate the question more, OK, in real time, although there were some problems in terms of him doing things and not necessarily catching what he was doing because he was doing everything in command line and I was still fairly new to it at that point. So but then he wrote it all up and then sent what he did an email.

50:15 So I had the record of it.

OK, and then when would you I mean, you mentioned this a little bit with regard to the topic, but when would you use as a question of stack overflow versus talking to somebody at the helpdesk?

So I only use the Help Desk for things that were. Directly related to running something or interacting with the cluster.

50:46 So most of the most of the coding that I'm doing is I just do it on my laptop and I run it on my laptop and that's fine. And so when it's a problem like that, where it's part of writing the software package, I'll use stack overflow if I if I can't figure it out on my own. So most of the time my process is I try a couple of things.

51:12 If they're if I sort of know what it is I'm trying to do, like I know what it means in code, which is I'm giving a little bit better right now. I'll usually go to the Python documentation for that to mean everything both on or about Python. And then if I can't figure it out there, then I'll just do a sort of generalized query on Google, and that usually takes me to stack overflow.

51:39 And if I've done that and I've looked through I've tried a bunch of different Google queries and haven't found the answer or haven't understood. If I've found the answer, then I'll ask a question directly on Stack Overflow.

OK. OK. And then I have like one last interview question for you. If you could create any hypothetical future technology and it just limited to what you think we can or can't do.

Right.

52:07 That would make collaborating easier.

What would it be or what would it do?

And an interesting question. I guess you know the universal translator on Star Trek? Oh, yeah, if you could do that.

52:30 But we're actually interfaced with the brain of the person to the point where, like, it would translate any jargon that the other person didn't understand or would translate different meaning. I mean, really, what we need is a sort of a direct brain link up so you can experience what the other person experiences. But that seems pretty far off.

So.

52:57 **I mean, I asked that question to kind of like identify needs rather than, like, actually try to, you're not trying to invent that technology because that would be great.**

Yeah. I mean, there's somebody here who's doing brain computer interfaces, but that's more of a machine learning type aspect.

Right.

Or action. So and based on my understanding of computer code that I have gained over the last year or so, I feel like trying to get a computer to understand me is going to be way harder than getting another person to understand me.

53:28 **So, yes. OK, so I do have a couple of questions in regards to demographics.**

Sure.

When I, I wonder which I'm absolutely required to report, which is how old are you all then.

I just turned <redacted>.

OK, and then you mature your position is as a postdoc.

Yeah. My technical title is <redacted>, so my main job is actually not research.

53:57 My main job is teaching. But it's a it's a type of postdoctoral fellowship.

OK, so yeah, I did like check out your website so like asking you, OK, and do you have any questions for me.

I don't.

OK, well thanks again. Thank you so much.

Absolutely.

Doing this, I mean when I put that I asked you on <redacted>, it was a total shot in the dark.

Yeah.

54:25 I'm always happy to help out with… I think there's a sleep study at <redacted> that they started when I was, I think, <redacted>.

OK.

And it's been like a longitudinal thing. So I get calls like every every five or ten years. I get a call from them and they ask me all the same questions. But yeah, I'm always happy to help out with people doing the type of research that you're doing.

Yeah, this is so helpful. Well, OK. I think that that's everything.