

00:00 **What is the average number of researchers on in general on a given project that you're on?**  
Oh, gosh.

00:29 It ranges from like, thirty-four to fifty. What is the general in these in these projects?  
**I'm asking these questions first, really generally, and then I'm going to ask you about a research project, OK? What are the roles that you and your collaborators are playing in these type of projects?**

01:00 So I start with what you what your role is then. OK, well, can I start can I just go through a project beginning to end.  
**Sure.**  
So there's typically like the grant writing role to get the money for the project. So that's usually some group of people will write the grant then there is once you get the grant, typically we collect samples.

01:24 So there are people who are involved in coordinating sample collection and, you know, calling all of the places where we're getting samples and then traveling there and then getting the samples and doing them and everything. Then there are typically like we process the samples. So there are people who are in the lab who then process the samples were doing a lot of sequencing now. So we have a group who does the sequencing of the samples. Then there's the analysis of, you know, what we find in the samples.

01:56 And so that's usually a group of people. That's typically where I am. And then there's sort of disseminating the results of the whole project. So that could be conferences or publications. And so that's like writing papers and stuff like that. Right. So you mentioned that you're involved in the analysis and I write papers and I do a grant. I help with the grant part of it.

02:26 And I don't I haven't done any of the sample processing like the lab work, really. And I understand it because I have to coordinate it, but I don't do it. And I haven't done much sample collection, just as I've done some.  
**OK, yeah. OK, so and then on a recent say, the recent project like <redacted>.**  
Yeah.  
**How many people are on the <redacted> one?**  
Oh my gosh. That's up like fifty eight.

02:52 I don't know the exact number, but there are a lot of people, and it has expanded— like, so, there's a group of people on the grant which is large, but then there's also people who after we got the grant have come on board. So yeah, I think I've seen the list because that was the list of people for me to contact.  
**So what would you say is generally like your smallest group, like a project with the smallest numbers for?**

03:21 Yeah. I mean I have a project that is unrelated to resistance. There's no sample collection involved. It's purely like reviewing the literature for certain question and we haven't really gotten started with it. But there will be like four people like it'll be my advisor, me and then two other people, and then the large one would be like the 50 plus. Yeah, 50 plus.  
**OK, so what are the same problems associated or with your costs and benefits with working in a larger group versus working in a smaller group.**

03:57 Well so the benefit is you just you like if there's sample collection involved and sample processing and you just can't do a project like that with a small number of people; like it's just impossible. I mean, the project that we've got going on for <redacted>, I think there's like over five hundred samples involved in that, you know, and the samples have to be collected in different states and

different, you know, different times of the year and different years. And like, just you can't just have one person doing that.

04:27 It just doesn't work, you know? I mean, for one sampling effort, for one of those projects, we had to send five people to <redacted> because we like the way that the industry works. Like they didn't want one person going from barn A to B to D decided they had they wanted one person just going into each barn, like for security reasons. So five people had to go down at the same time, not one person. So like that's an example like that just right.

04:56 And like, we just need so many different areas of expertise to get the project done that you need people who have expertise in all different things. So that's and I also think if you have the right group, if you make sure that you bring people on board, who do you work well with and are like nice people and whatever, it is really fun to work on a big project like that.

05:20 You know, obviously you get sort of subgroups from the larger group and it's kind of cool to work with like the different subgroups and then come together as a large group and then break off and you know what I mean? So that I think that that's like a fun way to work. I mean, the downside is just coordinating everything, you know, it's just like a massive undertaking to like make sure all of the different pieces are happening when they should and everyone's making progress. And then one group might have a problem.

05:50 And it's like, OK, how do we solve it and how does that of that problem affect all the other things that are happening? And so it's just really logistically it's a challenge. And it's hard keeping everyone up to date on everything all the time, you know, how do you usually do that when we don't? I mean, we have a weekly meeting, right. But probably a dozen people are there on average.

06:17 And so there's 50, you know, so there are people in the project who haven't really heard about what's going on in the project since our initial meeting, which was like eight months ago.

**OK, so you have like these dozen people in person.**

Yes. OK, yeah. So and then we had like the only the only comprehensive meeting we've had so far was back in like, I don't know, in February or something where we had everyone on the grant was on the call.

06:47 So there were people in the room. And then we also called people in the use of phone.

**Yep. OK. So when you had this like this last meeting where you had like a dozen people where you just had it. Right as of today.**

Yeah.

**OK, so was it like just would you say that that was like one subgroup meeting or a couple of subgroups meeting is like right before it's like the core people from a couple of different subgroups. OK, ok.**

07:17 It's like the core group. So it's you know, we have the main people who do the sample collection are there all the time and then like the main people doing the analysis. And right now we're developing a lot of new it's like a new approach. So we have a lot of just sort of pipeline development going right. So those people are usually there. And then the people who like the two guys who are the leaders on the ground.

Right.

That's <redacted> and all them.

Mm hmm.

07:46 **OK, so what about with smaller projects? What are the benefits and costs?**

Well, it's just more manageable, like, you know, with four people. I just send an email, you know what I mean? And like, it's way easier to keep everybody in the loop because there's only four people. Yeah, I think that's the main benefit is it's just easier to manage here.

08:14 I mean, the nice thing, I guess what this has never happened to me, but I could see in a large group there's just more chances for well, if you if maybe, like, certain people aren't as great to work with, like there's always other people, you know what I mean, in the group. Whereas if in a small group, like if you get stuck with someone who's not so great, then you don't really have alternatives. That's never happened to me. But I could see that that could be a problem.

**Right. Fair enough.**

08:41 **OK, so what percentage of your projects have involved at least one collaborator at another institution?**

This to me is yes, very rough, but one hundred one hundred percent.

**OK. So why, why did you choose to work with collaborators who are at other institutions?**

Oh well there's different reasons.

09:08 I mean, some of the projects we were brought on as collaborators by those institutions, so they asked us to collaborate with them. So the projects are housed at or near <redacted>. Yeah, like so the ones that I'm thinking about that were part of my PhD. So they had these projects ongoing that involved a lot of new samples and stuff and they don't really have epidemiologists in their group and we are maybe she's an epidemiologist.

09:36 So they had collaborated with my advisor before and so they needed some of that specific skill. So they called us other grants. It's usually because the people they're like, first of all, we know them. We know we can work with them. And then they have some skill or access to something that we don't have.

**What would you do if nobody that you already knew or worked with had something that you needed?**

10:10 Typically, then we call people we know and ask if they know anybody. So it'd be like second hand.

**OK, so would you say that when you're when you're choosing to work with people at another institution, it's because they play a vital role in the research?**

Yeah, yeah, yeah, yeah.

10:35 Or, you know, I mean with the with the genomic stuff, since it's new, like a lot of other places are trying to start doing it. And we have sort of the most experience, at least within sort of agriculture and stuff. And so they'll call us and say, hey, can you help us? You know, and we want to help people and we want to collaborate as long as they're nice and they're not going to screw us over. So we do that not because we need to, but because it's always good to have collaborations.

11:04 And it's you know, it's always good to have something she's lacking in.

**So are there any disadvantages or problems working with distributed projects, problems where you have collaborators at other institutions?**

11:34 Um. I just think that, you know, some of the collaborators, I've never even met them in person, so that's a little bit difficult because, you know, I just I don't even know really what they look like, and I, I don't know, like it's just a little bit harder. But in general, I don't find that it's that it's too bad. It's the hard part is when you need to talk to a lot of people at once. That's the hard part. So, like, if I just need to call up.

12:02 So, for instance, right now I'm working on a graphic for a paper and I don't do graphics, really. And so I called up this guy who does really great PowerPoint, like his graphics are really pretty. And I was like, do you want to help? He's like, sure, I can totally make that up. And so working with him, like I call him on the phone, just, you know, I don't need a meeting schedule, meeting or anything. And we just talk on the phone and it works really well. I've never met the guy in person, but he's great to work with.

12:28 But if it involves, like more than a few people, you know, then it's then it's just hard to manage like a phone call, like who's going to talk next? People tend to talk at the same time and you just don't get that sort of connection. So, like, I just gave two webinars last week and both of them had like 40 people on the call maybe. And so I gave the webinar, but like, they were all muted. And so you just don't get feedback, you know what I mean?

12:57 Like, I I'm just talking into the phone and I have no idea, like, are people following this? Do they have questions? You know, and then at the end there are questions, but it's hard to let 40 people ask questions on the phone, you know what I mean? So, yeah.

**Did you ever use some sort of like WebEx or Skype call or something?**

I use Skype once again, just one or one or two people, and that seems to work pretty well.

13:24 And then like I've used for my PhD defense, we used Bluejeans, which is a video teleconferencing, whatever system, and it works OK, except that like every time we have to use it, we have to call the IT department, have them set up a line, have like test out the system. There's always kinks like even though the same five people used it for my whole PhD, there was always something wrong, you know.

13:53 And so it's like it's just a lot of upfront work to get it to make sure it's going to work.

**OK, yeah. Oh, right, and so it is this just exacerbated by having people at another institution?**

Well, yeah, because we wouldn't do we would just call an in-person meeting.

**Yeah, sorry. That seemed obvious.**

No, no, that's OK. Double checking.

14:20 **And then what about benefits of way of working on groups with people at other institutions?**

Um, well I think you, you get access to different expertise like that's why we have them on board.

**Right.**

So like if we just restricted ourselves to what's here on site, we wouldn't be able to do a lot of these projects. So that's one thing I do think that you get a little bit there.

14:51 Sometimes you can get a different perspective, you know, on the project by working with a different group. I think as a student and someone who's going to be looking for a job, it's good because you have more connections in places that you can potentially go and employment. Yeah, I think you can if you don't restrict yourself to, you know, within <redacted>, then you can pick you have more options for who you can work with.

15:25 And so you can sort of handpick your team and make sure you're getting people that you like versus, you know, I mean, like if you stay within <redacted>, you might not necessarily find someone who you work with really well.

**So, OK, so what percentage of your projects involve collaborators here in very different fields? So I'm not talking about like the difference between epidemiology or microbiology, but say like between it and computer science or statistics or something like that.**

16:07 Well. I don't know a fairly high proportion now because of the genomics stuff. Pretty much pretty much all the projects we're working on now have a bioinformatics component.

16:27 So we're working with computer sciences and everything, things like I so we can escape from it. So I would say right now, all of them. Well, except for that four person one, but it's not really started yet.

**OK, what about earlier projects?**

Yeah, those were more those were more like pretty much working with veterinary, you know, within the veterinary field with epidemiologists, microbiologists status.

17:05 Well epidemiologists detail out of statistical that sort of.

**Right. Yeah.**

Industry like ag industry. So as you put it, like the total number, like the percentage that I've worked on. I'd say it's 50 50. Yeah, I mean, like actually like I'm going to be working with the <redacted> next year, they're not doing any right? So, yeah, that'll be the same.

17:35 **Right. I'm trying to avoid making you commit to a number because I'm trying to distinguish between someone who says roughly 10 and someone who says like all of them.**

Right. I see 50 50.

**OK, so are there any disadvantages or problems associated with working on projects that have collaborators that are in very different fields?**

Disadvantages?

**Yes, disadvantages.**

18:05 **And you can go on if there aren't any going advantages and benefits.**

I've found it great. I think that you could have some disadvantages is like just different fields have different they have different ways of doing things. So even like questions of authorship on papers, you know, like that's handled differently between different fields.

**Can you elaborate?**

Well, who's listed as a co-author, you know, so that can that can really vary by field.

18:41 **What else?**

Like, um. I don't really think a lot of it, though, is so much differences between the field, the science fields, it's more maybe differences between just how different groups work, you know, so I don't really see a lot of downside there.

19:03 I mean, I think it's worked really well because we have people in our group who can describe like if like if the computer science people are do something like really hard core computer science, like they can still translate that at a high level for us to so that we understand what we need to understand, even though we don't get all of the details. And like from our side, you know, we can describe to the computer scientists like, OK, this is what we're doing and how does that fit into what we need from you, you know, and what you're doing.

19:34 And so we've been pretty good at sort of translating that back and forth. But I can see if you're that might not always happen as well, you know, and so it maybe becomes hard to connect the work that one group is doing with the work that the other group is doing and make sure that you're going towards a common goal, you know what I mean? But it's so far, it's worked really fine for us, so that's good.

**Yeah. What about working on projects where all of your like that one, the earlier projects or the that one project where everybody's kind of in a very similar field or any pros and cons of that?**

20:09 Well, to me, the economy is just not as interesting because everyone comes from the same background and like everyone sort of works on the same stuff to an extent. And so it's just like you don't get those really different views, you know, and perspectives when you're talking. So I think that that's just more boring. I guess it's almost like there's more competition in a way, because you are working in the same field and you are doing the same stuff.

20:41 There's more potential for, you know, I mean, like territorial actions versus when you're working with people totally outside, like they've got their own funding sources and, you know, stuff they do and you have your own and like you come together to work on common things. But that's very collaborative versus like competition, you know what I mean? And so, yeah, I don't know. I like working with the more diverse groups, but I guess approach with the with the right group, working with people in the same field is like you all speak the same language.

21:11 So there's not that hurdle in the beginning. You know, you all sort of know the same people and you know what the issues are. So like you don't have to spend a lot of time giving all of the background. **OK, so it's a bit more efficient, probably. OK, so I'm going to move into now the third portion. It doesn't feel like it because I skipped the first one because I already know who you are.**

21:39 **OK, ok, so I'm going to start off by asking you, can you give me a ruthless high level list of tasks that are done in a in a project where you're collaborating that involve working with another person and actually collaborating so testing working with other people?**  
Yeah. Oh so. Well, a lot of them that I listed.

22:06 So we're writing grants, organizing sample collection, organizing project execution, organizing communication within the group. Organizing the sample, like doing the sample, well, the sample processing could be done by one person, I guess, although we typically involve multiple people in that doing the doing the analysis often.

22:43 If it's an analysis that's simple, like I'll just do it myself. But if it's an analysis that has any problems or we haven't done it before or I'm coming across issues with it, then I'll involve multiple people writing the paper, you know, starts out as a single person. But then once you get to a certain point, you send it out for coauthor comments and reviews. And so that becomes a group project.

23:13 Building new capabilities is definitely a collaborative project and we're doing a lot of that right now. Even things like going to conferences, typically we do that with other people in the group. I've gone to maybe one conference by myself and every other conferences with other people. Um.

23:41 **Yeah, what about data sharing?**  
Uh, you mean do we share within our group? Um, so our data is typically on a server and everyone has access to it. If they're like if I do an analysis in Excel and then someone else needs to see it, then I'll email them the analysis.

24:05 Or if I write a script or some code or something and then someone needs it, then I'll just email it to them.  
**So when do you use email versus putting information on the server?**  
So the server we the server is more like big stuff like that. We can't email and things that people use repetitively and it's like common, you know, and then stuff by email would be like smaller data sets that maybe not as many people are using.

24:44 And then also like outputs of analyses that I did, you know, that I'm sharing with somebody. So that's the benefit of using email over the server. Well, a lot of people just don't know how to get on the server or they don't have a they don't have a user ID or whatever. And honestly, it's just like habit. You know, like I've always used email, but I haven't used the server until a couple of years, so. Yeah.

25:10 **Do you have any have you had any problems using the server or using email to send data share data?**  
Um. Well, sometimes with the server, so the structure of the different directories and all that has been changing sometimes, and so then the data gets moved and so that can be a problem.  
**Right. Can you elaborate on why that's a problem?**

25:39 Well, because then they you can't find it. Right?  
**Right. Sorry. There are some things that that are like implicit. But I get to hear you say that.**  
So then like you said, you would tell someone, OK, the data is located like, is this path, right? And then they go to look there and it's not there. And so then you're like, oh, I don't know where it is. And then you find it. OK. And then email is not too hard except you. Fine, except you just can't send large files.

26:09 OK, so when you say when you're using do you use put data on the server to share with somebody with all like all the people that you share data with or just like some collaborators and we put data on there. Anyone can access it. But typically, I mean, we have so few users, people like people who actually know how to use a server that it ends up being just a few people who access.

**OK.**

26:40 Yeah. And the other problem with the server is that we can't get access for people who aren't as easy as you, OK, who aren't affiliated with the <redacted>. OK, so how do you manage that? We don't know yet. We're trying to work that out. OK, we've so we've worked around it when we can get people affiliate affiliated with <redacted>, like there's a process for making people affiliate faculty and then they get a <redacted> and so then they can get access to the server.

27:08 But that's only works for people who are faculty at home. And so we haven't had to do it yet for someone who's not faculty. But I do have someone who wants to get access to the server, who's not faculty. She's a postdoc and she's in Canada and like she has no so I don't know if we're going to be able to go. OK, so we've been we've been mailing hard drives to each other.

**Oh, my God. Though, I mean, I know that happens in this kind of research, but that just makes me cringe.**

27:37 And so now we've been mailing hard drives.

**Right. So, OK, so when you're working on, say, writing grants, coming up with grants, et cetera, what tools use to accomplish this task, word or...?**

Microsoft Word. Yes. And Excel for the budget.

**OK. And would this be those be examples of things that you're sharing via email?**

Yeah.

28:07 **OK, so. And then, yeah, this is going to sound goofy, but why specifically Word, I'm assuming Microsoft, the Microsoft Excel. Why specifically those tools?**

Because I have them on my computer and everyone I work with uses them.

**OK, so you mentioned a few things. Organizing sample collection, organizing the project. Actually, I just wrote a grant.**

28:36 Well, I didn't write a grant. <redacted> wrote a grant and she uses Latex or whatever. So I actually installed that on my computer and I did this.

**But wait, did you do you know what program you're using for that text works, OK? How is this like how does this feel like different from when you're using Word?**

I didn't compile anything.

29:05 So she had the different parts and I just downloaded a DOT text files and changed them and then put them back up to Dropbox. OK, so she shared Dropbox with me. And so I just let her know when I was done editing all the different sections and then she compiled.

**How did you let her know? Email or text or phone?**

One of the three. One of the three, yeah, we were on the phone, but I think I actually texted her when I was done.

29:33 **OK, so you would she would like break each paper into like one file for introduction.**

Yes, exactly. She had like six or seven different sections and so I just pulled them each section down from Dropbox, open it in that text works or whatever, and then added them there and then saved them back up to Dropbox. OK. And then she compiled it. And then she also had the big Larrivee and that opened up automatically in the tech.

30:05 And then I went in and added a few and then I did the dad, the slash curly brackets site, whatever. Right. And I don't know if it worked, but she didn't say anything.

**So what are you like comparing using Word to collaborate on like one document versus using a to collaborate on one document?**

So it was fine but it was— yeah, it was fine.

30:34 Like I didn't I don't have the knowledge yet or you know, I just haven't got as familiar with like how to make it bold and italicized. All right. So if I were actually like if I were actually putting the grant together and I needed to do all that formatting, like, I think it would be really hard. But I was just editing words and adding a couple of citations.

**Is there anything that went like better or worse?**

31:01 Well, well, I like using the drop the Dropbox like, that's nice, you know, and I do use Dropbox with some of the other grad students to share even just word files and Excel files and stuff like that.

**OK, so you just with grad students.**

Yeah, like I said, not with faculty, only with <redacted>. Only yesterday.

**OK, so why do you why do you use Dropbox with like just grad students?**

Because they use it and the faculty don't.

31:33 Yeah, right. Right.

**When do you use to use email versus using Dropbox if you're working with grad students.**

Well so like there's just one project where I'm working with two other grad students on the analysis of the data and everything, and one of them set up a Dropbox project for it. And I don't usually do that just because, like, it's just laziness is just a front time, like setting it up, sending out the invitations.

32:27 **OK, so you're saying that you just prefer to email things because setting up Dropbox is it's just a front, it's just more time consuming.**

OK, and then the other thing that I did set up and I've shared with a couple of people, actually, I shared it with like ten people with only two people have accepted is a tarot right for references.

**So why do you wait like this is?**

32:58 I don't know if you can answer this because you're not those people. Why would you guess those other people haven't?

**They don't have it installed.**

OK, I'm sure.

**And there's a bit of a learning curve with it. So I just don't even think they've installed it yet.**

OK, but I've got like hundreds of references on there, so hopefully, hopefully they'll do it so.

**Right. OK, so.**

33:25 **OK, so moving on, you mentioned organizing sample collection, organizing the project, organizing communication, organizing, sample processing. I'm going to kind of like lump that into just like organizing, right? Yeah. So what tools you use to accomplish that group of tasks?**

Just verbal communication, verbal.

33:49 So just like talking to somebody in person or emails or email.

**OK, so when do you use talk to somebody in person versus using email.**

Oh if it's going to be, if I feel like it's going to be a long conversation that was a back and forth then I'll just call OK. Versus like this is what you need to do.

34:19 Then I'll do an e-mail because it's just I don't know, easier. And you have a paper trail then.

**OK, so can you elaborate on what makes going back and forth on, on email. Difficult.**



34:34 It's just more time consuming like and then it can drag out over days, you know, whereas if I just call them I get the conversation done within with one conversation, you know, versus back and forth and then they don't get to the email or I don't get to the email and then it's just a longer are you typically emailing one like one person individuals or talking to individuals or usually I mean, when I'm talking about like project stuff, like housing project stuff, emails will typically be group.

35:11 Mm hmm. Mostly, I'd say probably. Definitely the majority and phone calls will typically be just one person. OK, so that's another way. I guess I differentiate between what I need to use. Like if I need to reach a group of people, then I'll send out an e-mail, OK, versus if I, I know it's just one person I need to talk to you, then I'll just call them.

**OK, so what about so why choose to send out an email to a group as opposed to doing a like a conference call.**

I don't know how to do it. OK, ok, ok.

35:41 I know that through the university you can call and set up a time to use the conferencing system, but then I have to be on a <redacted> phone in a certain location and half the time I do these calls I'm like driving my car or so. I only learned how to make long distance calls from <redacted> like you write the PIN code and I know, yeah, I have to use I have to use <redacted>'s phone right here in this office, but he's not here on Monday, so. Right.

36:10 **OK, so um. Yeah. Um, OK, so do you. I pretty much I think you answered these questions. So moving on to analysis, you mentioned that sometimes you do work with another person when you're doing when you're doing the analysis, what tools to use to facilitate this?**

Well, for me and a lot of analysis, we use the server or Excel, but typically, if we're talking about it, we'll do it in person.

36:40 **OK, um, so and then OK, so you when you're talking about using a server, you mean to share information, or...?**

No, no. Just to actually do it.

**But if we're talking about the analysis, it's typically in person or over the phone.**

OK, so why that over email.

**Because usually those are just more in-depth conversations that are hard to do over time.**

37:11 **OK, um, have you ever tried using something like Skype, or...?**

Yeah... I don't know, I just don't have a lot of people on my Skype contacts.

**Yeah, so then when you're using Excel, you're using it for analysis.**

37:42 **How do you share that?**

With email, usually email, or like with that one project because we have a Dropbox folder for it. Then I'll use the Dropbox. I'm pretty bad though. I always forget to use to update the Dropbox.

**OK, so ok, we talked about all those things. I just start to get a little repetitive, but you know, I'm really digging for data here.**

38:08 **OK, so with paper writing and you did mention this a little bit, but I'm going to when you were talking about grants, I'm going to be talking about again, because it might be slightly different. So you mentioned that people writing typically starts with like one person writing and then it gets, like, sent out.**

Yeah.

**OK, so what are we what is being used for the sending email? Are there any problems associated with it? OK, what about when you're are you sending it to one person at a time or to the whole group?**

38:39 The whole group.

**And then are you asking them for you're asking them for feedback or to edit it or review it? OK. And then they do that with like the track changes.**

- 39:07 OK, so they'll track changes to your comments and then I get all of those and I just try to integrate them.
- OK, are there any issues with integrating?**
- Yeah, it's a pain in the ass. So it's I know. I'm just. Yeah, I get that. I usually so they don't all come back typically at the same time. So I'll take the first one. I'll make the changes based on their changes.
- 39:35 I'll accept the edits or whatever, or I'll, I'll deal with any comments they have and then the next one will come through and I'll do that. And sometimes they're conflicting and then I have to like, like the same sentence, they'll have different comments about it or they'll change it a different way. And then I have to figure out how to do it. So it's yeah, it's a process for sure. It's not ideal.
- How long does it typically take?**
- To deal with comments, yeah, oh, that's hard because I just sort of work on it here and there.
- 40:11 Sometimes what I'll do is like if I have multiple comments from like four people, you know, where they write the comments and word, I'll compile them into one document. So I'll cut and paste each of the comments and what it means. But I see them all together. That takes a while. And then, you know, some of the comments like I especially want as a PhD student, I didn't feel comfortable addressing them, like I wanted to make sure I was addressing correctly or whatever.
- 40:35 So then I'd have to schedule a meeting with my advisor to talk through it so I can take like you can take definitely a few weeks to go through that whole process. OK, so we talk about building new capabilities. This seems like a really large, broad like activity.
- Yes, but what are the what are the tools that are used that is like really just in person?**
- 41:05 Or I guess most of the tool building we're doing here is you with people here, <redacted>. So that's just like a lot of in-person time. And then and then also e-mail and phone.
- OK, so email, phone and in-person, when do you use one over the other?**
- 41:33 Well, in person sort of happens at our weekly meeting and then oftentimes so like <redacted> and <redacted> and myself and sometimes a couple other students will meet before that big meeting and talk through things specific to the development of the bioinformatics pipeline or whatever. And so we'll meet we'll talk separately as like a subgroup.
- 42:00 And then we have the big meeting. And then often afterwards, like grad students will stay or stick around and then talk amongst ourselves and like basically sort of like talk about problems, talk about where we are, and then, like, put together a plan, you know, for what we're going to work on next. And so that's sort of done in person. And then I feel like if we haven't had one of those in-person meetings for a while and people have problems, then they'll email the group.
- OK.**
- 42:28 Yeah, and then four phone calls, if I like, if I just have a problem and I'm like, OK, I just need to ask <redacted> about it, then I'll just call her. And what I often like often that's not the most efficient way because, like, I'll talk to someone on the phone, but then that information does not get disseminated to other people in the group. And so then I have to like remember to relay what we talked about to other people, you know, and that happens a lot is like this relay back and forth is like, oh yeah, we had a conversation.
- 42:59 Sorry for didn't tell you about that, but you just can't keep track of all of it. This happened with in-person meetings and phone, even email. Like if I forget to see somebody on email should be on there and then they're not like it happened to <redacted>. So <redacted> and I were emailing with

some people who put together databases and up in <redacted>, not collaborators of ours, but we had questions for them about their database. And so we were going back and forth.

43:27 And <redacted> wasn't on that email chain, I think, just by accident. And so he's like, what? What are you talking about? With all, you know? And so now I'm like, oh, I got a forward you all of that email and say that you're up to speed on it. You know, some things like that happen a lot. OK, so are there. The. No, I think that's answer.

43:55 **I mean, one big problem you have that I think is going to be somewhat solved is that we don't have anybody organizing our group.**

OK, so if I group you the whole <redacted> project or?

**Yeah.**

In the court like any of it. And so the people who are in charge, like they don't have time to take minutes to keep track of like who's working on what to send out emails to the group, getting everyone up to date know like we wanted to have like the website for our group, be like an internal facing thing to where we can put updates up there so that everyone knows what's going on.

44:37 But like that hasn't happened because everybody's busy. And so we just hired actually an admin <redacted>. There's a meeting next Monday. Yeah. Yeah. So she so she's like hopefully that she's going to do a lot of that, you know, she's going to do a lot of like just sort of organizing the group and yeah. We'll see how it goes. I don't envy her job. No. I mean from what I've heard from you and from <redacted>, it sounds like a difficult situation.

45:09 **Well, it's just a lot of.**

Right. There's just a ton of moving pieces and we don't have time to do that like we you know what I mean? Like, we actually have to do the project, you know what I mean? And so and we're not good at that either. I'm definitely not. And so it's yeah. You just we need somebody whose job it is to make sure that communication is happening. So.

**Yeah. OK, so my final question for almost final question for you is, if you could create a hypothetical future technology that would help with collaboration,**

45:44 Yeah.

**What would it be or what features would it have or how would it help you think of this almost like magic box that did things you don't have to think about, like what you think technology?**

Well, something that just kept track of all of the different things that are happening like that that kept track of OK, like <redacted> and <redacted> had a meeting at this time and they talked about this.

46:16 And this is what resulted from that in that everyone could see that, you know, and like then, OK, this paper is and has been sent out to authors for review. Here's the paper. Like something that just like centralized all of that so that it's almost like a log file of like, you know, like what has happened, what was covered and then and then what tasks grew out of that and who's working on them, you know, like that would be I mean, I don't know how you.

46:49 Oh, you don't have to worry, OK, I do it. But I feel like just having that overview and like a log file of, OK, what's happened amongst the different groups and what is everybody working on, because I don't think really anyone has that broad overview and it's certainly not being tracked, you know what I mean? So that would be helpful.

**OK, do you have any questions for me?**

No.

47:16 **OK, I have one last question for you, and I apologize because I have asked you this before, but I misplaced my binder full of notes from my last one.**

Yes.

**How old are you?**

<redacted>

**OK, I have to do that for external validity.**

OK, right.