

DOPE LABS

Transcript of Lab 023 ____

Zakiya: Well, if you can't tell, I'm congested. I'm sick.

Titi: Yes, and I'm worried about you, friend. My friend can't even laugh. Did you hear that?

Zakiya: But it's not just me. I feel like everybody is sick.

Titi: Yes.

Zakiya: And I understand it. But I also don't understand.

Titi: Right. And the thing that is making us all feel very nervous about everybody that's sick is the Coronavirus.

Zakiya: Yeah. There is pandemonium. Panic about coronavirus, you know, all on my Instagram and Twitter. Y'all are out here wearing nail shop masks and it's not right! I haven't said anything.

Titi: I saw summer walker had on gloves, a mask. She's not playing around. I've seen a lot of people that have been using all types of tricks to try to keep germs away. My poor friend, you hear that sad laugh. We're gonna get through this episode.

Zakiya: We will! I'm going to try to suppress the cough.

Titi: I'm Titi.

Zakiya: And I'm Zakiya.

Titi: And from Spotify studios. This is Dope Labs.

Zakiya: This episode is all about Corona virus. And we're gonna go through everything we know up until this point with the Corona virus expert, Dr. Kizzmekia Corbett from the National Institutes of Health or NIH.

Titi: Yeah. So let's jump into the recitation.

Zakiya: All right. So today we're talking about.

Both: Coronavirus.

Zakiya: I know you're seeing those memes and tweets.

Titi: And the tweets and the articles.

Zakiya: Yes. News clips,.

Titi: Everything. It's all over the Internet.

Zakiya: And it can all become really confusing really fast. I saw some pictures and I was like, I'm not sure these were even taken in 2020. The people the way the whole background looked I was like "people are just reusing clips, sharing stuff".

Titi: Doctoring images.

Zakiya: Yeah.

Titi: Putting the World Health Organization logo on it and just sending it out.

Zakiya: And sharing it. And they're sharing for laughs. But then the next person that shares it doesn't say this was a joke for my friend.

Titi: Exactly.

Zakiya: And we have misinformation everywhere.

Titi: Exactly. So people are walking around saying all types of stuff that I'm just like that that don't sound right.

Zakiya: That's not quite how that works. And I've been trying to not be a "well, actually" in everybody's mentions, but it feels so tempting.

Titi: So we know what you guys are saying on the Internet and in memes. But we wanted to know what y'all were saying on the street.

Voice 1: I feel like the flu is more effective on the demographic based off the fact that there's more deaths from the flu. Than is Corona as of right now. Until we're able to get more scientific facts and see what's going on with it, I can't say too much, but I definitely think the flu is worse.

Voice 2: You know, I think we're probably overreacting slightly. I did go on Amazon to see if they had any paper masks on prime and they're all out. So I think, yeah they're all out on prime. Do you have any I can borrow? OK,.

Voice 3: I'm going to a superbowl party tonight. And they asked me, bring some beers so I went out last night and I got a couple six packs and I bought some Corona. And the checkout person said, oh, I'm glad someone's buying Corona. And she said, actually, sales of Corona are going down because people think that somehow Corona beer is connected to the Coronavirus.

Titi: Are you nervous? You travel a lot.

Voice 3: I'm not nervous about Corona virus. I spent a lot of time in Liberia when the Ebola outbreak was in full swing. And so I guess I have a little bit of experience working in those kinds of situations. And if you're careful and and stay away from the most intense places, then there's not display much danger. But I certainly don't think there's any danger anywhere in the United States or outside of a few places outside of Wuhan.

Titi: This episode is going to be doubly as good because my friend Zakiya, who is holding her chest as she's laughing,.

Zakiya: Stop it!

Titi: My poor friend! Is also an expert in all of these things. So she really understands coronavirus, how it moves, shakes and everything like that. So we're going to be using her brain to help us get through this episode.

Zakiya: I wouldnt say I am a coronavirus expert? But I love all things micro. All the bacteria and viruses are my friends and I love to learn about them and talk about them. This is the one time I've missed teaching microbiology. OK. This feels like the best time to be in a classroom.

Titi: So what do we want to know?

Zakiya: So we want to know.

Titi: Well, let's start with I want to know,.

Zakiya: OK

Titi: Because what I want to know is basic. I want to know what is a coronavirus. I want to know where it came from.

Zakiya: Right.

Titi: How did this just come out of what seems like nowhere? What do you want to know?

Zakiya: I want to know how is it spread? I want to know what's been changing over time. Right. And is there a need for panic and worry? What can we do to prevent transmission and spread like how much is in our hands. How much can we control and how much is just set in stone.

Titi: I love that.

Zakiya: Let's jump into the dissection.

Titi: To help us out we called on Dr. Kizzmekia Corbett.

Dr. Corbett: I am Kizzmekia Corbett. I am a senior research fellow and the scientific lead for the coronavirus vaccine and immuno pathogenesis team at the National Institutes of Health, National Institutes of Allergy and Infectious Diseases Vaccine Research Center. I am a North Carolinian. I'm black. I'm a woman and all the things.

Titi: So the question that I need answered, because I mean, we know generally how a virus moves and shakes because of our Protect Your Neck episode. That was Lab 4.

Zakiya: Right.

Titi: So I learned a lot from that. But I feel like this is different and I need to know what exactly coronavirus is.

Dr. Corbett: Corona viruses are a large family of viruses, actually. Generally speaking, corona viruses infect bats, civet cats, etc..

Zakiya: All right. Did you hear that? Because I've seen your means with Corona Beers and that's not the link. OK. We asked Dr. Corbett to explain why it's called a coronavirus. And she told us it has to do with the physical properties of the virus. The thing to remember is that the word corona is Latin for Crown.

Titi: I like my Coronas with a lime.

Dr. Corbett: The surface of the virus actually looks like the crown that a queen would wear. Right. So think about the inside of the virus being a queen's head and then the surface of the virus being like the crown. And actually that crown is made up of some proteins that are called spike proteins. They just are spiking up off of the surface of the virus. And so basically you have this ball with a crown of spikes around it. And that's what the virus looks like.

Zakiya: Just building on that model of a ball with the crown, that ball contains the genetic information to make more virus when it enters a host cell in that ball is also coated in proteins that create kind of an envelope around it. And then some of those proteins stick up. And those are the spike proteins that give the Corona virus's name, which Dr Corbett just described.

Titi: OK. So we know that coronavirus is found in bats and civet cats. But are there any types of coronavirus that are infectious to humans?

Zakiya: Yeah, there actually are. So two of them you've probably heard of MERS, which is short for Middle Eastern Respiratory Syndrome. And so we had a big MERS outbreak in 2012.

Titi: Right.

Zakiya: And then SARS, which is severe acute respiratory syndrome.

Titi: Right. I remember that in 2003.

Zakiya: Yes. That's right. There are also a couple other coronaviruses that are less well known. And sometimes when people say, oh, I had the flu or I felt I had this respiratory infection or I felt bad. Sometimes people have actually been infected by some of those other corona viruses. So the coronavirus isn't new to humans. They're a respiratory virus family that we've known about. But this particular virus is new.

Titi: Wow, that is crazy. So a lot of us might have had one of the other corona viruses before, but not this one. This one is new. So scientists are now naming it.

Zakiya: That's right. The Corona virus, that's all over the news right now is called the 2019 N Corona virus.

Dr. Corbett: Then that N stands for novel or new. So what that means is that it is new to humans and it is new to the phylogenetic tree.

Zakiya: Scientists use the phylogenetic tree to understand relationships. So they may ask, is this virus more or less closely related to another virus based on similarity?

Titi: The symptoms of the 2019 novel Coronavirus are cough, fever, shortness of breath, and some patients have even reported having nausea, vomiting, diarrhea and in some cases, symptoms progressed to bronchitis or pneumonia.

Zakiya: And now that we understand some of the basics about the Coronavirus, let's look at what's happening right now. Where did this particular coronavirus come from?

Dr. Corbett: So there are, you know, hundreds of species of coronaviruses that dwell in animal reservoirs.

Titi: Animal reservoirs are animal sources where the virus might be found. So for the swine flu, the animal reservoir was pigs for bird flu, it was birds. So even though the virus is new to humans, it had to have a host before. And scientists have been working to figure out where the new coronavirus was before it showed up in humans.

Dr. Corbett: It probably for however many years, I mean, upwards of hundreds has been circulating in. I think they've now named the reservoir to solidly be the bat. So it's probably been circulating in bats.

Titi: OK. So if a virus exists in bats, how does it get to humans?

Zakiya: That's a good question. Right. So the first thing you might ask is what the genetics of it like, how is that even possible?

Titi: Yeah,.

Zakiya: And it's possible. You know, we haven't encountered it before. We aren't that different from bears. That's the thing to remember. We're both vertebrates and mammals, you know. So there's genetic similarity between humans and bats and our host cells might be similar to bats. So we may have the same receptor door. You know, if you think about like we described it before as a virus knocking on the door, trying to get it, we might have that same door that that coronavirus uses that was on bat cells. We might have that same receptor door on ourselves.

Dr. Corbett: One of those things that is similar enough between us and bats in this in this particular case is the receptor for the virus. So the molecule on cells that this virus binds to is enough similar between bats and humans that with some slight modifications in evolution, which is what viruses do. They evolve. It could become more and more infectious to a human.

Zakiya: So thinking about that, right? The first documented case of 2019 n coronavirus was reported in Wuhan, China, at an open marketplace. And there are a variety of ways that it could have infected people there.

Titi: The second thing is how do you get a bat in a human physically close enough to transfer the virus?

Dr. Corbett: You know, you can pick up bat poop in a cave and sequence tons of corona viruses. I mean, so it could have just been, you know, there if in an in a seafood open seafood market, you know, bats fly in there and I handle their whole business.

Zakiya: I think Dr. Corbett hit a really good point. You don't have to go into a cave to come in contact with a bat.

Titi: Yeah.

Zakiya: You know, as our population grows and we're expanding in a different space is what used to be wildlife area is now your backyard.

Titi: Right. I see Fox running through my front yard almost every morning.

Zakiya: Really? Yeah. I don't see anything but my neighbor's dog.

Titi: Wildlife.

Zakiya: What we do know is that you can find coronavirus in bat poop.

Titi: OK.

Zakiya: Right. I don't even know a bat poop. Looks like. Do you?

Titi: No.

Zakiya: It could be on the table and I would pick it up.

Titi: Me too.

Zakiya: Because I wouldn't know what it was. Oh, I don't want to say I would pick it up. But, you know.

Titi: I mean, you don't know what it is

Zakiya: You don't know what it is.

Titi: You have no idea, It could look like eraser shavings. And you are like ok i'll just brush this off.

Zakiya: So now you got viral particles on your hand. And if you're working in open air market, you could be. So this is something where it could be on the food. Right. Or where you could be shaking hands with somebody or you can cover your mouth to cough or I mean, anything, right. Where this could be shared or spread around.

Titi: Or touch a doorknob or touch something that a lot of people touch. You get on the bus.

Zakiya: Yes.

Titi: Sit down in a bus seat see you touch the seat, touch the handles.

Zakiya: Yeah. That's so important. So if you work in a market, you have multiple opportunities to contact with tons of people. And then those people are contacting other people. And right now, we don't know a lot about how the transmission work.

Titi: Right. And I think a good point that you made was that as our population grows and we have less space for the wildlife, so their habitats are getting smaller because we're encroaching on their space. The the rate that we are going to be coming in contact with animal in like parts of their lives, rather be their feces or whatever is going to increase.

Zakiya: That's right. That's right. So true. And I think the other thing is, even as the rate increases its important to know that not all animal viruses can adapt to humans, even if a virus does make it to a human, that doesn't necessarily mean that it's going to become a global health emergency Like this novel coronavirus has.

Dr. Corbett: These bats, for example, or whatever animal is, their reservoir carries the virus and maybe a human does come in contact with it and maybe a human does get infected with it. But we're not we're not the natural hosts for these viruses. They're really not made for humans. So the virus does it hasn't built up the capability to replicate efficiently and transmit from human to human efficiently.

Zakiya: And that is the key thing to remember is that viruses can evolve.

Titi: So that virus at first brushes up against a human. And that immune system has not seen this before. So it doesn't even really know what to do. But then also the virus itself doesn't know what to do. It doesn't have the tools it needs in order to infect and get into that host cell and get into the kitchen and start cooking.

Zakiya: Yes. And so that one isn't able to replicate. Right. That one maybe doesn't infect a human. But let's continue on in time. right. And so as the virus continues to exist in this animal reservoir, which we say is a bat. Now, remember, we have similarity to bats. So now your virus is robust. Right. Its like, hey,.

Titi: I've been lifting.

Zakiya: I've been lifting weights. I've been a pumping iron. So now interacts with the human in Wuhan and is like, yo, I've got a Swiss Army knife. I'm ready. I know exactly how to pick this lock. This same key that I used in bats, I'm going to try right over here.

Titi: Skeleton key.

Zakiya: Skeleton key. Turns out we've got the same lock.

Zakiya: Right. And now it opens up the door

Titi: I'll let myself in.

Zakiya: That's right. I love my friend. I'll let myself in. And now is using your castiron skillet. OK. And its cooking up more virus. Just cooking up more virus. And so now you have viruses replicating in humans. So it's adapted,.

Titi: Right.

Zakiya: In this particular Corona virus has adapted to be able to to not only go from animal to human, but now to transmit from human to human pretty efficiently.

Titi: There are now over seventeen thousand confirmed cases and over 350 deaths.

Zakiya: And that number is just going to continue to rise, it's wild.

Titi: It is.

Zakiya: And because this is spread to over two dozen countries, the World Health Organization has declared the 2019 corona virus a global health emergency.

Titi: When we come back, we'll talk about how the virus is spread. What scientists like Dr. Corbett are doing to stop it and what you should do in the coming weeks.

Titi: And we're back. Let's talk about how Coronavirus spreads infected people can share the virus by coughing, sneezing or touching others.

Dr. Corbett: Diligence behind what you're doing in your everyday life can prevent a lot of infections, you know, coughing into your sleeve and not your hand, washing your hands, etc.

Zakiya: We all know that people aren't great about keeping their germs to themselves. So how worried should we be about contracting Coronavirus?

Dr. Corbett: You shouldn't be alarmed by now. There's human to human transmission in the United States like that's what viruses do.

Zakiya: A recent case of novel Corona virus in Washington State found that the virus is not only in the lung, a lung excretion.

Titi: So coughing and sneezing,.

Zakiya: Yes, but it was also found in this individual's fecal matter, that's poop.

Titi: This is another reason why hand washing is so important. This is how stomach virus is our transmitted.

Zakiya: Yeah. People don't think about that fecal to oral route.

Titi: Right. Nasty.

Dr. Corbett: The virus is doing what it set out to do. Last time I checked, I believe the case fatality rate was around still around 2 or 3 percent. Right. So the case fatality rate is fairly low. More often than not, the people that succumb to coronavirus infections have prior ailments or are elderly.

Zakiya: Two to three percent means two to three people per one hundred. right. So when you think about this, just for some context, MERS killed about 30 percent of the people it infected SARS kills about 10 percent.

Dr. Corbett: And that's not necessarily beneficial from an evolutionary standpoint, from a virus like you don't want to kill your host.

Titi: These viruses are setting up shop in your body rent free. They need you and your host cells so that they can keep replicating and existing.

Zakiya: And so what we're talking about now is two to three. So the fatality rate for this corona virus is much lower than the other two we've seen.

Titi: Right.

Zakiya: Thinking about their existence. Let's talk about their eradication. This gets us right to Dr. Corbett's work. She and her team are working on a Coronavirus vaccine.

Titi: And this isn't as easy as you might think.

Dr. Corbett: You can't just say make a vaccine. It's not trivial to create immunity to that. Right. You have to do some thing, some designing, protein engineering, manipulation, platform delivery.

Zakiya: One of the most important steps to infection is viral attachment. That knocking on the host cell's door is then when a viral protein attaches to or binds to a receptor on a human cell.

Dr. Corbett: We study, you know, particular amino acid sites on proteins and, you know, study how various mutations and viral proteins affects whether it be an immunogenicity or expression in cell culture.

Zakiya: Dr. Corbett is talking about a couple of things here. You want to understand what site on a protein is important for attaching to a wholesale. And then you also need to understand which receptor on your host cell is important. So, for example, Long Cell has over a thousand different surface proteins.

Titi: Oh, my gosh.

Zakiya: So someone has got to figure out which one this newly discovered virus binds to.

Titi: And Dr. Corbett is optimistic that a vaccine will be in clinical trials soon.

Dr. Corbett: And the reason why the research is actually moving so fast is because people have been studying these, including myself, for some time. You know, we study B cells. We study T cells here. I don't particularly, but we do have a T cell expert in our lab. You know, we study antibodies on the mono level. So like one antibody, we will study for how well it binds to a thing. How well does it kill a virus? How well does it do it is whether the mechanism does it have. All of these questions are in a backdrop of this vaccine design.

Zakiya: But until the vaccine comes out, what should we do from a public health perspective?

Dr. Corbett: Be aware, but don't panic. You know, people are like, oh, should I get on a plane? What if somebody came in from China? First of all, the CDC is screening heavily and they are the best in the world at what they do. The Centers for Disease Control, the United States Centers for Disease Control is amazing with diagnostics and prevention and screening. And so still get on planes, still hang out with your friends. If, for example, this thing turns out to spread across the country, I have no idea what it's going to do. But if it does turn out to spread across the country.

Wash your hands, sneeze into your arm, go to work, come home and go to sleep. And then when our vaccine comes out, take it. The end.

Zakiya: I think that was pretty clear it wise. We went into this trying to figure out what a coronavirus is, where its name came from and where it came from. I think we've done those things. How it spreads. You know, we have one route that's lung secretions and.

Titi: Coughing, sneezing.

Zakiya: And we have another potential route,.

Titi: Oral fecal.

Zakiya: And then I think the next thing is how worried we should be about this. I think it's important to have some context.

Titi: Absolutely.

Zakiya: You know, a lot of this early reporting about, you know, transmission. So how many people can be infected from one case that is transmission under a certain set of conditions? Right. That's transmission when nobody knows that coronavirus is a thing. And so that's transmission where you might have a different type of infrastructure. You have to remember, this was an open, wet market. So you're talking about open tanks and buckets with fish, viral matter, you know, or fecal matter from bats in something and water splashing around everywhere. That's very different.

Titi: Anything can happen.

Zakiya: Anything can happen.

Titi: There are a lot of variables that are important to determining the transmission rate.

Zakiya: Right.

Titi: And we can't just neglect all those things and say, oh, all Asian people have coronavirus. That's racist.

Zakiya: It's racist And it's ridiculous scientifically. Right. What we know is in this space and time where we are right now, global trade and global travel is real. Right. So, yes, this was identified in Wuhan, but that's it. Right. It was identified Wuhan. And everybody is. And why wasn't necessarily Chinese and everybody that has coronavirus isn't necessarily Chinese.

Titi: Exactly. And it's just it's just so unfortunate because of the way that these viruses are named. They take the name of the place where it was first discovered. And so then you get this negative stigma associated with that place. And it's not really fair, I don't think.

Zakiya: And what we also know is that, you know, people are drawing back in making faces when someone is sneezing or coughing. Yeah, sure. But also, the incubation period before you start showing symptoms is two to 14 days. That means if you have a long incubation period, it takes a while before you can catch this stuff. Right. And so that's part of why we see this really big increase in the number of cases, because you can be asymptomatic for a long time.

Titi: Right. So just like Dr. Corbett said, there are things that we can do to help eradicate this disease from our communities. And that is doing the right hygienic things in order to make sure that the virus isn't spreading, the virus can spread and attach to another host cell in you then got a choice but to go away.

Zakiya: I think another thing just in thinking about hygiene. I don't even want to get into the masks. OK. Leave the mask to the public health workers. I see all your wearing your mask inside out I'm like, you've turned it the wrong way.

Titi: They don't even have the right type of grade mask to keep out something of that particle size.

Zakiya: a viral partical is so small. Yeah.

Titi: You have to go and research those things yall.

Zakiya: You need to read.

Titi: My friend is fed up, you need to read.

Zakiya: But I think the thing here is to understand distance that viral particles can travel. So if we're talking about coughing or sneezing and what's the travel distance for the Wuhan virus? It can only travel about six feet from an infected person. OK. Now, we don't know much about it being able to exist on the surface, how long that lasts. But just for perspective. You're worried about the coronavirus. But measles, on the other hand, can travel up to 100 feet and it can stay alive for hours on the surface.

Titi: Oh, my gosh.

Zakiya: So I'm just gonna drop that there. So I think, you know, those are kind of things that you need to think about.

Titi: Don't sleep on coughing into your sleeve. Some people are thinking that, oh, the virus will travel through use. Like it matters like if you put it on your hand, we touch everything with our fingers, like you put it in your in the in the crick of your arm? You're not touching things with that.

Zakiya: Yes.

Titi: And all those little things make a big difference.

Zakiya: It's so true. I think I've learned a lot about this. The Coronavirus and how it is spreading has been a really good exercise for me in critical reading, right. What I see in inspecting the meme that I that people are sharing that I make sure I don't then share.

Titi: Exactly.

Zakiya: Also, it's a great exercise in public health, like what people understand, what they know and don't know. And it helps us see some of the outages. You know, I think for me, this was a great eye opener. And I'm like, oh, I need to do a lot more science outreach to my own people.

Titi: Exactly.

Zakiya: To my own folks. Yes.

Titi: It be your own people.

Zakiya: That's it for Lab 23. Don't forget to check out our Web site for our cheat sheet on today's episode and our show notes because we are dropping all the links to everything you need to read on dopelabspodcast.com. We had to talk about rotavirus because it is everywhere, but it's also Black History Month.

Titi: Yes. And for our semester finale, which is in two weeks.

Zakiya: Yes.

Titi: Very exciting. We want to highlight all of the black people in STEM all over the world. So if you are black in STEM or you know somebody that's black in STEM and then tell them to go to dopelabspodcast.com/stem To look for information on how they can be a part of our semester finale.

Zakiya: Yes. I can't wait to hear from y'all.

Titi: also, we love hearing from you. What do you think about today's lab? What are your ideas for future labs? Our number is 2 0 2 5 6 7 7 0 2 8.

Zakiya: You can also find us on Twitter and Instagram @DopeLabsPodcast. Titi is on Twitter at @dr_tsho

Titi: And you can find Zakiya @zsaidso.

Zakiya: follow us on Spotify or wherever you listen to podcasts. Special thanks to our guests, Dr Sarah Perkins Kirkpatrick. We have some links to her work and some resources she provided. If you want to learn more about what's happening.

Titi: And some links on how you can help with the effort in Australia.

Zakiya: This episode of Dope Labs is produced by Jenny Radelet, Master of WaveRunner studios and Elizabeth Nakano, Mixing and Sound Design by Hannis Brown. Special thanks to Masako Fukui.

Titi: Original theme music is by Taka Yasuzawa and Alex Sugiura with additional music by Elijah LX Harvey.

Zakiya: Dope Labs is a production of Spotify Studios and MegaOhm Media Group and is executive produced by US.

Titi: Titi Shodiya.

Zakiya: And Zakiya Whatley.

Titi: Wrong. This was supposed to be.

Zakiya: Yeah, down below when you said wrong. I got so nervous. I was like, you doing it wrong?

Titi: No, I said I was talking to myself like, that's not right, because.

Zakiya: It was so mean you wouldn't talk to me like that.

Titi: I would not. I would never.

Zakiya: Then don't talk to you like that.

Titi: Okay. I'll try my best.