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Alright, well hello everyone and thank you for coming to this installment. Of the 2024, engine biotech experience teacher roundtable series.

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My name is Reagan Davenport and I work in the ABE program office.

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I'm the community of practice liaison and so it's a pleasure for me to host this roundtable today because I always appreciate the space to meet and see all of the wonderful folks that I hear about from the ABE program office, all of the wonderful things you're doing, and all of the wonderful things that your site is doing as well.

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So for those of you who are new to the series, these roundtables are designed for our incredible ABE teacher community from around the world.

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And it's a chance for all of us to get together, to hear and learn from experts, from each other about topics of interest in science, in biotechnology.

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So we hope you find this series valuable. And if you have any suggestions or ideas that you think would make a great roundtable topic.

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Please email us at the ABE program office and let us know. We are in the process of planning future roundtables and so we would love to have that input.

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From you all. And who spend most of your time in those spaces. So this roundtable will be recorded and posted on our website and you will also receive transcript of the discussion that we have today if you're registered for this webinar.

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So we will have time built in at the end for audience questions. But we encourage you throughout the presentation tonight to put any questions that you have in the chat.

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And we'll be sure to watch for those and ask your questions at the. Okay. So I'm going to jump right in by introducing our amazing panelists, Melanie Rosenhardt joins us from ABE the Netherlands.

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And has done extensive work with educators in the field of science education. And human biology.

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She wants to integrate opportunities to build science skills at all levels and she has been an incredibly valuable contributor to the ABE Netherlands program overall and she assists her site by facilitating a learning for teachers.

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We're also joined today by Silvia Velechio from ABE, Italy.

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Who currently teaches science at the G. Marconi Scientific High School in Is it, No.

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Sorry.

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I was trying to I'm trying to say where your high school is at I'm like am I saying it?

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I'm probably not saying it correct is it, Felagna?

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And.

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Oh, okay. Italy, thank you, Sylvia. Thank you, thank you, thank you, for me out there.

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Sylvia is passionate about working with students and providing them with opportunities for research in science education and she also serves as the ambassador for the trainers at the ABE Italy site.

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So Melanie and Sylvia, thank you so much for joining us. We are pleased to have You both with us this evening because it is like 10 o'clock where they are joining us from for all of our all of our US folks.

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So really appreciate them taking the time to come and have this discussion with us. So we're just going to begin by learning a little bit more.

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About our panelists and their journeys as educators within science education. So Melanie, would you mind telling us a little bit more about your pathway into science education?

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And your current role, including your work with AB.

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Yes. I will. So after I did my biology bachelor, at the university and in.

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And after that I started with my masters in forensics, in forensic science. And during my monstrous night.

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Entered the science communication by doing as a student assistant working at the university but working actually at high schools. And teaching them with science.

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And actually during my job over there I entered and the DNA lips on the road. It's i'm product leader over there Now, and but I started when I was a student and then became coordinating over there.

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Not in so long. And then in 2,016 we were approached by ABE by the ABE program.

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And because we already have a program going on in the Netherlands by itself. So we had a big, network and they approached us.

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To collaborate with AVE. And yeah, we said yes about that. And then. We entered the program in 2,017.

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And in 2,019 we started with the kids and one of the kids is. Do you taste PTC and it's actually precision medicine kit we now have for AVE.

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And we have now currently Now, official, we have 3, but we already have 4. Because we had last week we have a new distribution site in the Netherlands in the north of the Netherlands.

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And so we have like, 4 kids now. And in all those locations we do PDIs with the teachers and teacher training programs.

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So they can enter the kit and the the kid with the students at her school. Yeah, teachers are really enthusiastic because with this kit they do Worst the microbead thing, they do the gelatto for races today, they, and the PCR of course I do everything by themselves.

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With these kids And the equipment is a little bit new, it's not like the older ones with the big BCR.

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In the back of the classroom. No, they have, we have now, we have mini PCR.

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And they are small. Be sure machines. And they have to install themselves the students so they are more I say that's in the lead of our own science and then you learn about their own genotype and about their phenotype and that's really interesting for the students.

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They learn something from themselves. Oh, it's the question.

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PDI, so they work. And always to get her and have you can see. Do you see my?

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Mouse? Yeah, okay. So this is the.

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And they are doing something on the ice. I think they are. Doing the the PCR. Setting in.

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They all work with mobile phones. Do. Put on the the PCR.

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And nowadays in the Netherlands. And the high school kids are not really allowed anymore to have their mobile phones in the class.

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So, so we have the shift with that. This is just our PC. And then this is me presenting and our different distribution site.

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This is in Delft. And you can see the The Blue Jail from a mini PC as well with a little doca on site.

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And this is in Naymaker. And they are practicing. With the practice chill before every step before they actually do something, we let our teachers practice before.

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They actually insert something into the gel or in tubes because was what I already said is some teachers.

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Maybe my group a bit years before so for them it's also new. Just like students actually. So,

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We just let them, learn. You can if you see in the back you can already see our kit in boxes the blue kids

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So they will do everything. And we show them some steps and we represent a little bit more on the board.

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So it's like do something and we do a lecture kind of thing. And also give them during the PDI of course they also we also give them heads ups or this is maybe if you have 20 students.

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You can maybe do something like that if you have a little bit if you have 30 students. If you want to owe a quote, you can do it like this.

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So we give them handouts. What to do in your own class situation. And this is our, I will show our kit.

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This is our, so if teachers come collect our kit. This is what it looks like. It's containing in 3 boxes.

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And they are like stroller suitcases so you can roll them. You can see here the form right this yours.

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And for chapter phrases. And you know the cost. Good gel lunch, costing. And then of course the tips.

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Directs that Pipettes and Centre for Fougé. The tasting paper, we use the toothpicks to collect.

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So line for simple buckle swap and This is a mini cooler where all locations will go in, so it's.

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Up to one. Minus 20°C I don't know how much it is in far right, but it's to keep it frozen.

377:59:52.000 --> 377:59:53.000

And. We get the miniature kids. And that's with the the aga rows and the tips and stop it like something like that.

377:59:53.000 --> 377:59:54.000

So the teachers. And they book a time slots. They come to us to pick up. At one of our distribution sites.

377:59:54.000 --> 377:59:55.000

And they. Go to their school and put their relations immediately in their freezer. They can loan the kids for like 3 weeks.

377:59:55.000 --> 377:59:56.000

Or maybe 4 and they can Get one kit or multiple kids depends on how many students they have of course.

377:59:56.000 --> 377:59:57.000

And will return the kit again and then. We all setting said everything ready for the next as teaching alone.

377:59:57.000 --> 377:59:58.000

And in the beginning or the end of the year they we will. Yeah, give a PDI so they can attend to one of the PDIs and you try to do the PDI.

377:59:58.000 --> 377:59:59.000

All around the country so they don't have to travel much. So we are in the Netherlands, but we also have some Belgian.

377:59:59.000 --> 378:00:00.000

People so from Belgium they also speak Dutch they will lend our kid as well so they it goes also abroad.

378:00:00.000 --> 378:00:01.000

It's they go all broad as well. So this is our kid, yeah, some pictures more to zoom in.

378:00:01.000 --> 378:00:02.000

This is how it looks. Yeah, I don't know. The PCR tubes inside.

378:00:02.000 --> 378:00:03.000

This is how it looks like and it's also very handy. That with the foam the teachers can see how they handle how to do to put stuff back.

378:00:03.000 --> 378:00:04.000

And it's just easy for everyone.

378:00:04.000 --> 378:00:05.000

And he's a sound light. And I slide show on a little bit. Yeah, and after they were turned a kid, the teachers get an evaluation.

378:00:05.000 --> 378:00:06.000

So if maybe we they have tips for us or not. Yeah. So that's it. Oh.

378:00:06.000 --> 378:00:07.000

Thank you. Thank you for sharing. So there is a lot that goes in to this persistent module.

378:00:07.000 --> 378:00:08.000

Alma, excuse me, precision medicine lab and I'm just wondering if either of you or both of you.

378:00:08.000 --> 378:00:09.000

Have I know Melanie you just spoke about the evaluation that you give to teachers and you say, okay, do you have any?

378:00:09.000 --> 378:00:10.000

Tips for, you know, how we can maybe organize this better or make it more, you know, easier for you to access.

378:00:10.000 --> 378:00:11.000

Do you find that you get Feedback from the teachers like their responses. Are they asking for the same thing?

378:00:11.000 --> 378:00:12.000

When you say tips, do you find there's a sort of like a theme or a big idea that they're sharing that you all have integrated into getting the kids.

378:00:12.000 --> 378:00:13.000

Actually mostly, we, wrote our, Manuals and how do the do the step step by, so, your program is sometimes They said maybe you can Right, it's a little bit easier.

378:00:13.000 --> 378:00:14.000

Good we also notify we use kits from mini PCR And. They change sometimes.

378:00:14.000 --> 378:00:15.000

Okay.

378:00:15.000 --> 378:00:16.000

The insights of the, so it looks differently and I thought, okay, they changed it like in one year they change it 3 times or something so I was like okay I need to rewrite again and This is not handy for us and then, oh, if we order something from them, oh, what does it look like?

378:00:16.000 --> 378:00:17.000

What is something new do they have to add? To gel green or is it already in the taps because now they already integrated in the text but before they had it not integrated so at a different workwise to to prepare a jail and that's very important.

378:00:17.000 --> 378:00:18.000

If the manual is. Yeah, actual is correct. So that was in the beginning it was a thing.

378:00:18.000 --> 378:00:19.000

But for now.

378:00:19.000 --> 378:00:20.000

Some teachers are, I don't know, during the PDI. I don't know if you saw the casting tray of the mini PCR, but they have the slots.

378:00:20.000 --> 378:00:21.000

2. To make slots in your gel it's underneath the casting tray.

378:00:21.000 --> 378:00:22.000

And I was called by teachers where I looked everywhere and the kit, where are those slots? A slide here, underneath the casting trace, sorry, so you just need to swap.

378:00:22.000 --> 378:00:23.000

Yeah.

378:00:23.000 --> 378:00:24.000

So we had that a couple of times, but that's the easy one. So that's, but not for.

378:00:24.000 --> 378:00:25.000

No, maybe Sylvia, maybe you have.

378:00:25.000 --> 378:00:26.000

Do you have any? Tips or something that your students and teachers are asking for when you start to use the precision medicine, a lab.

378:00:26.000 --> 378:00:27.000

And my students, have appreciated, the, the, the, digestion with the restriction enzyme in this phase and the related electrophoretic run.

378:00:27.000 --> 378:00:28.000

Because they were able to visualize the results of the entire experimental phase and verify they reported. Experimental phase. And, and verify they reported this.

378:00:28.000 --> 378:00:29.000

This is a very important. Experimental phase. And verify they reported this. This is very important.

378:00:29.000 --> 378:00:30.000

Also the activity on the case, the baths on the tongue is a very interesting but also very very fun.

378:00:30.000 --> 378:00:31.000

Okay.

378:00:31.000 --> 378:00:32.000

Thank you.

378:00:32.000 --> 378:00:33.000

They are at the end had the old blue tongue. And while the investigative ABC activity, and exciting but difficult because this activity are different from from usual teaching methods.

378:00:33.000 --> 378:00:34.000

I in all experimental faces, I, I have not problems because, also the, I have used is very simple to to use and the activity of the teacher is focus on the gesture of the class of the students.

378:00:34.000 --> 378:00:35.000

And, to simplify, the process, I, over the over the pathway in the different phases.



378:00:35.000 --> 378:00:36.000

Because is more is more sample. Is more simple. And the in introducing the ABC baby activity, improve the learning of the theoretical concept.

378:00:36.000 --> 378:00:37.000

The abstract concept. And so carry out each phase is with the simplify the process, the experimental process.

378:00:37.000 --> 378:00:38.000

That is, oh, I'm sorry. Yes.

378:00:38.000 --> 378:00:39.000

Can I ask a practical question? So in the Netherlands, are you doing the regular ABE labs with the restriction digest in the ligation?

378:00:39.000 --> 378:00:40.000

I know they are in Italy. So practical we. Thinking I want to know when your teachers are incorporating this because this seems like an awful lot.

378:00:40.000 --> 378:00:41.000

Of material to cover. Our teachers get the kits for 3 weeks to do the main foundations of biotech labs and so are they doing this as a standalone later in the semester?

378:00:41.000 --> 378:00:42.000

Are they attacking this on after the foundations labs? How are you doing this?

378:00:42.000 --> 378:00:43.000

Oh, Melanie, you're muted.

378:00:43.000 --> 378:00:44.000

Oh, that's okay. It's okay.

378:00:44.000 --> 378:00:45.000

Oh, sorry. Okay, Karen, a lot of questions in one question. So. What's your first question?

378:00:45.000 --> 378:00:46.000

Are your teachers doing the foundation labs? As well as this.

378:00:46.000 --> 378:00:47.000

Not a teachers. I have students as a master class they will do. Def, the normal, ABE laps.

378:00:47.000 --> 378:00:48.000

Okay, so are these are these?

378:00:48.000 --> 378:00:49.000

With, you mean, the transformation, you mean like that.

378:00:49.000 --> 378:00:50.000

Right, right. So. I'm assuming let's say teachers don't have their own equipment.

378:00:50.000 --> 378:00:51.000

So they're gonna have to bar equipment to run the foundation labs as well as for this EPM lab.

378:00:51.000 --> 378:00:52.000

Section. So that's why I was asking how long it was taking your teachers to get through this because if I already I'm giving out my kits for 3 weeks, I'm not sure they have time to tack this on.

378:00:52.000 --> 378:00:53.000

No, yeah. So we only use the kit for the purchase in medicine.

378:00:53.000 --> 378:00:54.000

Okay.

378:00:54.000 --> 378:00:55.000

And that depends on how many classes they will do. So we have a teacher who books. But they can do multiple classes and those classes have different times of schooling, hours.

378:00:55.000 --> 378:00:56.000

So they have to, yeah. Arranged that in those 3 weeks because the time slot of 3 weeks is also including to collect and to bring back the kids.

378:00:56.000 --> 378:00:57.000

I don't know if very

378:00:57.000 --> 378:00:58.000

Okay, and Sylvia, is that the same with you that your teachers are they also doing the foundations labs and adding this on at the end.

378:00:58.000 --> 378:00:59.000

Or doing it at a different time.

378:00:59.000 --> 378:01:00.000

And I don't understand, excuse me.

378:01:00.000 --> 378:01:01.000

So your teachers, they do the foundations of biotech labs.

378:01:01.000 --> 378:01:02.000

Yes, and also another teacher, are present in my school that, have a

378:01:02.000 --> 378:01:03.000

Okay. That have that collaborated with A. B. Pet Way.

378:01:03.000 --> 378:01:04.000

Okay, now do they do the precision medicine after they're finished with those other labs? Okay.

378:01:04.000 --> 378:01:05.000

Yes, also in a precision medicine. Yes.

378:01:05.000 --> 378:01:06.000

Okay. Okay.

378:01:06.000 --> 378:01:07.000

Okay, Karen.

378:01:07.000 --> 378:01:08.000

3, 3 teacher.

378:01:08.000 --> 378:01:09.000

Okay, so Melanie told me in the chat that it took her teachers about 5 h to cover the lab materials and the, you know, some of the concepts for EPM and, but yours looked a lot more involved.

378:01:09.000 --> 378:01:10.000

How long? Did it take your teacher Sylvia too? Cover this entire module.

378:01:10.000 --> 378:01:11.000

Okay. Yeah.

378:01:11.000 --> 378:01:12.000

So for, for, I will maybe, for, so for our teachers, I will teach them what they could teach and of course they're during when they teach the precision medicine in their classes.

378:01:12.000 --> 378:01:13.000

I don't know how long it will take. Maybe they do multiple hours and more. To, get the concept right about your geotypes in the phenotype and SNP and stuff like that.

378:01:13.000 --> 378:01:14.000

I don't know how much 10 they will take but for all the lab work and some basic concepts it takes like 4 or 5 h and maybe they along it with.

378:01:14.000 --> 378:01:15.000

And like a presentation what Sylvia already does a little bit more. We have also the presentation that if they want to to something sideways, they can always.

378:01:15.000 --> 378:01:16.000

It can take longer and do the other question. We don't do the foundational apps. In our school because we're not allowed, but we.

378:01:16.000 --> 378:01:17.000

Okay.

378:01:17.000 --> 378:01:18.000

Hire a week, give the opportunity to students to come to the university to do that. So it's a whole different, so different.

378:01:18.000 --> 378:01:19.000

Okay, okay.

378:01:19.000 --> 378:01:20.000

Program for us to run.

378:01:20.000 --> 378:01:21.000

Okay. Alright.

378:01:21.000 --> 378:01:22.000

So maybe now can Sylvia say how much how long? Their teachers will teach about.

378:01:22.000 --> 378:01:23.000

And I understand. I do the experimental phase in, 20, in, 20 h in the laboratory.

378:01:23.000 --> 378:01:24.000

Okay, okay.

378:01:24.000 --> 378:01:25.000

Okay.

378:01:25.000 --> 378:01:26.000

In 12, excuse me, to help ours.

378:01:26.000 --> 378:01:27.000

Thank you.

378:01:27.000 --> 378:01:28.000

And I actually, I was wondering, Silvia, do you use a kit from mini one?

378:01:28.000 --> 378:01:29.000

For position. Okay.

378:01:29.000 --> 378:01:30.000

Yeah.

378:01:30.000 --> 378:01:31.000

Yes. The, the key to of mini one, the taste of genetic medi Labs is the key to more, more, that have have the digestion, the DNA extraction and amplification and amplification is complex, complex.

378:01:31.000 --> 378:01:32.000

Then there is a complex, DN extraction, and amplification is complex, more complex.

378:01:32.000 --> 378:01:33.000

Then there is, Kid, no more complex. Only the electrophoretic run of the sample just treated.

378:01:33.000 --> 378:01:34.000

Okay. And how old were your students? On the picture? Yeah.

378:01:34.000 --> 378:01:35.000

Yeah.

378:01:35.000 --> 378:01:36.000

Yes, in my presentation, there are, there were my students and the students are 24 each time and of the First class.

378:01:36.000 --> 378:01:37.000

And in 5 class, of the high school, the last here. Of the schools.

378:01:37.000 --> 378:01:38.000

Yes, 1817, 18.

378:01:38.000 --> 378:01:39.000

So the age is done 17 till 18 or something. Yeah. Yeah, okay. Yeah.

378:01:39.000 --> 378:01:40.000

So we use the kids, our teachers use the kit for adding. Also similar, 16 till 80 years old.

378:01:40.000 --> 378:01:41.000

And we also say that if they have the kit. In their school notified to other teachers from.

378:01:41.000 --> 378:01:42.000

Different classes like H is from 11 to 14, you can do the pipetting. Classes for them as well.

378:01:42.000 --> 378:01:43.000

To learn about pipetting if you already have all those micro-pipe that you can just do the micropipetting.

378:01:43.000 --> 378:01:44.000

Courses with them. We have him in the slides, in the manuals. You can do them already with them.

378:01:44.000 --> 378:01:45.000

The younger, kids. But then the teachers need to talk to each other and that is there.

378:01:45.000 --> 378:01:46.000

Yeah.

378:01:46.000 --> 378:01:47.000

Also, I use a, always the first 2 laboratory of the AB pathway on a particular warning because it's important to to teach the use of the microiipette and the electrophoric.



378:01:47.000 --> 378:01:48.000

Yeah.

378:01:48.000 --> 378:01:49.000

So I use it always the first 2 laboratory.

378:01:49.000 --> 378:01:50.000

Yeah, and we also send our teachers and students and their students to Lap Exchange as well if they can already learn about.

378:01:50.000 --> 378:01:51.000

All those basic concepts as well.

378:01:51.000 --> 378:01:52.000

Yeah.

378:01:52.000 --> 378:01:53.000

I love this conversation. We have so many wonderful. So first of all, thank you, Karen, for asking that question because it has opened up a really good discussion.

378:01:53.000 --> 378:01:54.000

What portions of the lab are being covered, how they're being covered, the timeframe for them being covered.

378:01:54.000 --> 378:01:55.000

I know that I was just at a meeting for ABE with a group of teachers. Us teachers and they were talking about you know, sort of some of the challenges that they have around getting them set up and like to the distribution sites and getting them, you know, 2 teachers and getting them back from teachers and some of the things they can do and some of the things they can't do like you alluded

378:01:55.000 --> 378:01:56.000

to, Melanie. And so this is helpful because I'm hearing some of the things that you're saying about, you know, this is how we do it, or you saying that like students can go and do the portion that they can't do in school, they can go to the university and do it.

378:01:56.000 --> 378:01:57.000

And so. It's very helpful and I think teachers in the ABE community they'll appreciate knowing this because that's sort of one of the things.

378:01:57.000 --> 378:01:58.000

That I feel like I hear a lot about the precision. Medicine lab. That there's all these workarounds and they're not really sure how to work around them and so thank you again Karen for asking and thank you Melanie and Sylvia and I see Anna in the chat offering.

378:01:58.000 --> 378:01:59.000

Up what it looks like it with your audience, with your students and with your teachers and how it looks at PDIs and different things like that.

378:01:59.000 --> 378:02:00.000

So I appreciate that, so much. Does anyone else have any questions? For either Sylvia or Melanie that they would like to have answered.

378:02:00.000 --> 378:02:01.000

Okay, good.

378:02:01.000 --> 378:02:02.000

Okay.

378:02:02.000 --> 378:02:03.000

So I'm gonna guess just one practical last question. So we, we just got through a giant pandemic and do your students have any limitations about putting toothpicks in their mouth or they still obviously they're allowed to do that in your country and dispose of the waste of the trash there.

378:02:03.000 --> 378:02:04.000

So, sorry, Okay.

378:02:04.000 --> 378:02:05.000

Yeah.

378:02:05.000 --> 378:02:06.000

Yes. So everyone here is really paranoid about, no, we can't have them put PTC paper on their tongue and we can't have them use a toothpick and I'm like, we did it just before.

378:02:06.000 --> 378:02:07.000

Yeah.

378:02:07.000 --> 378:02:08.000

There's the COVID, why can't we do it now? But, so obviously you guys are able to do that.

378:02:08.000 --> 378:02:09.000

The kids are tasting the PTC themselves. And they are scraping and extracting their own DNA.

378:02:09.000 --> 378:02:10.000

Yeah.

378:02:10.000 --> 378:02:11.000

Yeah, but if they're with their finger in the mouth, they will smear sliber everywhere anywhere.

378:02:11.000 --> 378:02:12.000

Yeah.

378:02:12.000 --> 378:02:13.000

Yeah.

378:02:13.000 --> 378:02:14.000

At all too so I don't know if you want to do is alive a kid somewhere I will happy to do it the forensic hit I have with life no but No, so but in the Netherlands.

378:02:14.000 --> 378:02:15.000

Actually. We never heard about that. In school. Stumped.

378:02:15.000 --> 378:02:16.000

Yeah, bacteria transformation they say known in Atlanta.

378:02:16.000 --> 378:02:17.000

No.

378:02:17.000 --> 378:02:18.000

Yeah, yeah, we can do that, but, you know, we can't have students put a piece of peat because I think that the PTC, them tasting it themselves and seeing it on the gel, that's the most aha

378:02:18.000 --> 378:02:19.000

Oh.

378:02:19.000 --> 378:02:20.000

Yeah, I know that Germany, it's not allowed to do the PTC tasting in their mouths because they put chemicals in our mouth.

378:02:20.000 --> 378:02:21.000

Chemical chemicals.

378:02:21.000 --> 378:02:22.000

Yeah.

378:02:22.000 --> 378:02:23.000

Yeah, I think teachers believe us that we're good people and we don't land out stuff that it's not good for their students.

378:02:23.000 --> 378:02:24.000

I don't know.

378:02:24.000 --> 378:02:25.000

That's harmful for children, right?

378:02:25.000 --> 378:02:26.000

I mean, a student could always decline if they wanted to, but yeah.

378:02:26.000 --> 378:02:27.000

And yeah, if they don't wanna do it, they will not book us. I think that's the whole thing.

378:02:27.000 --> 378:02:28.000

Okay.

378:02:28.000 --> 378:02:29.000

Don't book our kids. And they, yeah, we enclose the PTC paper.

378:02:29.000 --> 378:02:30.000

Okay, okay.

378:02:30.000 --> 378:02:31.000

We will enclose what's what it what it is so they can read what it is. So, and with the toothpick, they scrape them out.

378:02:31.000 --> 378:02:32.000

They always, I always say don't. Do it too hard that we don't want to scrape blood or something or just Do gently but scrape enough because if you don't Do it right that you don't have DNA.

378:02:32.000 --> 378:02:33.000

Yeah.

378:02:33.000 --> 378:02:34.000

So that's. You want to, but I also saw something in the chat about the bioinformatics.

378:02:34.000 --> 378:02:35.000

I know that in this model you can also sequence your own DNA. We don't do that. I think that's time consuming and price wise as well and cost money.

378:02:35.000 --> 378:02:36.000

Right, yeah, I think we, we, that, but they just provide sequences for the 3 different.

378:02:36.000 --> 378:02:37.000

Phenotypes and then they look back.

378:02:37.000 --> 378:02:38.000

Yeah, but that's a good thing. And we also comparing them with other animals as well because other animals have them as well.

378:02:38.000 --> 378:02:39.000

Does snip. So,

378:02:39.000 --> 378:02:40.000

Yeah, that is also interesting. Why? You have this PTC tasting and why don't and That's something.

378:02:40.000 --> 378:02:41.000

Yeah, exactly.

378:02:41.000 --> 378:02:42.000

It's all it is always very interesting. And the different.

378:02:42.000 --> 378:02:43.000

Which you be willing to share that information on the other animals? I mean, do you look at things like herbivores versus carnivores?

378:02:43.000 --> 378:02:44.000

That'd be kind of interesting.

378:02:44.000 --> 378:02:45.000

Oh, okay.

378:02:45.000 --> 378:02:46.000

I don't know. I know that there's some primates on. I saw the, I don't know.

378:02:46.000 --> 378:02:47.000

I don't know if there are carnivores on it as well. I don't think so.

378:02:47.000 --> 378:02:48.000

Right, I know, I know, that's why I was wondering if they have it at all.

378:02:48.000 --> 378:02:49.000

It's because of fruits. It's like Yeah, yeah.

378:02:49.000 --> 378:02:50.000

That's interesting. So if you do have like a link to that, maybe you could email it to me.

378:02:50.000 --> 378:02:51.000

That will be great.

378:02:51.000 --> 378:02:52.000

Okay.

378:02:52.000 --> 378:02:53.000

Yeah, everything in our presentation. I will share your Because it's also it's from a bioinformatics thing.

378:02:53.000 --> 378:02:54.000

Okay.

378:02:54.000 --> 378:02:55.000

It's I think it's from blast. You blast it so you can if you can bless the snip parts you can see what kind of another other animals half this as well.

378:02:55.000 --> 378:02:56.000

So.

378:02:56.000 --> 378:02:57.000

That's interesting. Thank you. Look at all of the thought. How about all the thought partnering is producing?

378:02:57.000 --> 378:02:58.000



This is amazing. Debbie had a quick question because I know we're about 2 min over time so I don't know folks can stay on for another 2 min over time so I don't know folks can stay on for another 2 min but Debbie had a question for you, Sylvia.

378:02:58.000 --> 378:02:59.000

And it says when Sylvia has her kids compare numbers of taste buds to research data. Do you have your students do any statistical testing?

378:02:59.000 --> 378:03:00.000

And if so, what kind?

378:03:00.000 --> 378:03:01.000

You're on mute, Sylvia. Sorry. We can hear you.

378:03:01.000 --> 378:03:02.000

Okay. I, I use a, in general when I do these, taste, on, this test on taste bats.

378:03:02.000 --> 378:03:03.000

I use disc of paper to to obtain the same surface where I I count the number of the over the bats or the peppe left Monday for me and I I saw the puppet left wing for me and I I saw that the number is the same for me and I saw that the number is the same for each type of phenotype.

378:03:03.000 --> 378:03:04.000

And I saw that the number is the same for each type of phenotype. Have from 0 to 1011, 12.

378:03:04.000 --> 378:03:05.000

From 11 to 30 our taster medal taster and up to super taster or to Easter.

378:03:05.000 --> 378:03:06.000

I do this, test since, to and 2021 And the number is not always the same, but is similar, very similar.

378:03:06.000 --> 378:03:07.000

And the the frequencies that I had, I have found, is, the same of the fragrance obtained in letter tool from a Caucasian population.

378:03:07.000 --> 378:03:08.000

Thank you.

378:03:08.000 --> 378:03:09.000

Is very interesting to compare the electrophoretic around the data over the electrophoretic data run and the number of the papill.

378:03:09.000 --> 378:03:10.000

But is not only these reasons for a different perception over the bitter taste because there are there is there are other factors.

378:03:10.000 --> 378:03:11.000

Was also protein in the mouth in the saliva that can inhibit the sensitivity to a better taste.

378:03:11.000 --> 378:03:12.000

There are many many manufacturers that influence the perception of the bitter taste. Not only genetics, not only the papilophoni, but environment factors in in the goof.

378:03:12.000 --> 378:03:13.000

In the moth.

378:03:13.000 --> 378:03:14.000

Thank you so much. And I feel like that's such a good example for running the lab. Across many classes or, you know, every year keeping your data and just building a data set that your kids can really, you know, analyze.

378:03:14.000 --> 378:03:15.000

But thank you so much. That's that's that's such a great idea. Thank you.

378:03:15.000 --> 378:03:16.000

I, I, I, I do, every years, with different classes. And I do this test since, 2,021.

378:03:16.000 --> 378:03:17.000

So is a 3 for also 5 years. That I do this, this, 3, 4, also 5 years that I do this test.

378:03:17.000 --> 378:03:18.000

Great. Thank you so much. Great question, Debbie. Like I said, there's so many things that have come about from this discussion.

378:03:18.000 --> 378:03:19.000

So as we come to the end of our time today, we're a little bit over, but this was such a great discussion.

378:03:19.000 --> 378:03:20.000

It's worth it. I always want to say final thank you to our panelists. I'm Mel Melanie and Sylvia.

378:03:20.000 --> 378:03:21.000

Thank you for joining us. In the wee hours of the night over there. We hope this roundtable was informative and gave you some ideas for how you can implement.

378:03:21.000 --> 378:03:22.000

The precision medicine lab in your own classrooms. You're welcome to visit us at the ABE website.

378:03:22.000 --> 378:03:23.000

Anytime, Sarah, don't know if you can throw that, email in the chat again for me.

378:03:23.000 --> 378:03:24.000

And again, please stay tuned for more information about future roundtable discussions and how you can participate.

378:03:24.000 --> 378:03:25.000

This is making me think maybe we need a part 2. So I am going to, have to have some conversation with the program office and see what they think about that.

378:03:25.000 --> 378:03:26.000

But as we know the ABE teacher community, you all make the program thrive and grow. And so we want to thank everyone for being here, everything you're doing for educators in students worldwide.

378:03:26.000 --> 378:03:27.000

And as always, we like to thank the Amgen Foundation for supporting the Amgen biotech experience.

378:03:27.000 --> 378:03:28.000

I hope that you all have a wonderful rest of your week and thank you for joining this ABE roundtable.

378:03:28.000 --> 378:03:29.000

Thank you so much.

378:03:29.000 --> 378:03:30.000

Bye everyone. Thank you. Thank you so much. Happy Easter!

378:03:30.000 --> 378:03:31.000

Happy Easter.

378:03:31.000 --> 378:03:32.000

Thank you so much, Happy Easter. Thank you.

378:03:32.000 --> 378:03:33.000

Okay, take care.

378:03:33.000 --> 378:03:34.000

He's.

378:03:34.000 --> 378:03:35.000

Could you share your presentation as well Sylvia? Maybe I would like to add the tastes but

378:03:35.000 --> 378:03:36.000

Testing as well. Good thing. Yeah, sounds weird. Yeah.

378:03:36.000 --> 378:03:37.000

I love that.

378:03:37.000 --> 378:03:37.000

Thank you