**ProjectXYZ - Clinical Trials Biomarker Testing - CompanyABC**

0:0:0.0 --> 0:0:12.460  
Angela Angle  
OK, I've started the recording so it will just be helpful to start off this call if you could just give a brief summary of your background and the types of companies that you've been at and your role in.

0:0:12.680 --> 0:0:18.750  
Angela Angle  
I'm selecting and evaluating zeros for performing biomarker testing services. That would be great.

0:0:19.800 --> 0:0:31.630  
David Soto  
Sure. My total experience in pharma irony is 21 years. That includes about 15 years of experience in oncology.

0:0:33.500 --> 0:0:46.610  
David Soto  
Clinical and translational work. I established a precision medicine and biomarker functions at my company. All of my experience has been at large biopharma companies.

0:0:47.610 --> 0:1:4.460  
David Soto  
So while you know a lot of this work is done internally in our own labs, we do outsource close to 50% of this work through external partners, different types of partners, the specific.

0:1:4.560 --> 0:1:35.150  
David Soto  
Uh. The focused biomarker companies that we work with are bioagilytix, Alta Sciences, QPS, precision for medicine cell cottage, every major partner for it's been for a long time. So depending on the type of biomarker, we outsourced genomics, proteomics, mass spec and immunoassays and things like that. So the, yeah, we've been, we've been outsourcing increasing amount of this work over the years.

0:1:35.250 --> 0:1:44.200  
David Soto  
And that all briefly relates to the increase in biomarker research and precision medicine. So we've communicated quite a bit of experience there.

0:1:44.880 --> 0:1:45.170  
Angela Angle  
Umm.

0:1:45.250 --> 0:1:47.150  
David Soto  
Does this give you enough background?

0:1:47.950 --> 0:2:19.110  
Angela Angle  
Yes, that that's very helpful. So I think I might go one test category at a time. You mentioned immuno assays and also proteomics and for those types of tests, I just kinda wanna understand any general trends you're seeing in the industry today. Are there certain types of assets or trials that require more or less of these tests and how you see the industry evolving over the next three to five years and?

0:2:19.210 --> 0:2:23.520  
Angela Angle  
Regards to needs for proteomics and other related biomarker testing.

0:2:27.370 --> 0:2:41.870  
David Soto  
So you can if if you would like to identify, you know, find differences in volume in significant differences. You can probably look at immune and ecology assets requiring more immune assays than.

0:2:42.950 --> 0:2:50.590  
David Soto  
You know regular small molecules or biologics. You can also look at autoimmune drugs.

0:2:50.680 --> 0:2:57.190  
David Soto  
A little, you know, using more immune assays, but generally speaking.

0:3:22.240 --> 0:3:22.520  
Angela Angle  
Mm-hmm.

0:2:58.830 --> 0:3:27.160  
David Soto  
The volume of in all of these categories have been increasing and that regardless of the therapeutic modality, because we're looking at biomarkers, we're looking at detecting proteins and genomic differences as potential predictors of drug response. We're also looking at things like receptor occupancy for monoclonal antibodies. So it's increasing across.

0:3:27.320 --> 0:3:33.720  
David Soto  
Spectrum. But if you want to highlight certain types of modalities, maybe more for biologics and even more so for.

0:3:34.640 --> 0:3:38.730  
David Soto  
I'm sorry the you know, oncology drugs.

0:3:40.720 --> 0:3:52.500  
Angela Angle  
And so for the higher need for biologics, is this because you're performing those receptor occupancy assays or other things that are specific to it being an antibody drug?

0:3:54.80 --> 0:3:57.400  
David Soto  
That is one reason. The other reason is that.

0:4:3.110 --> 0:4:3.370  
Angela Angle  
Umm.

0:3:57.480 --> 0:4:10.690  
David Soto  
Umm we perform anti drug antibodies ADA assays and that is to determine immunogenicity because biologic molecules can by antibodies monoclonal antibodies can.

0:4:10.970 --> 0:4:19.20  
David Soto  
A promote antibody formation themselves and so and that can be detrimental to their efficacy.

0:4:20.230 --> 0:4:21.850  
Angela Angle  
OK. Yeah, that makes sense.

0:4:22.760 --> 0:4:28.310  
Angela Angle  
I did want to ask about a few different specific technologies and the proteomics.

0:4:30.70 --> 0:4:37.320  
Angela Angle  
Immunoassay space. So I'm curious for mass spectrometry, is this how much this being used for?

0:4:38.80 --> 0:4:40.590  
Angela Angle  
The preclinical and the clinical stages.

0:4:43.10 --> 0:5:12.300  
David Soto  
So the essays are always established as preclinical stages. We now we're now at the at the stage where we the precision medicine programs are advanced enough for us to discover candidate biomarkers prior to going to the clinic and the hope is that we don't always achieve that. But the hope is that by the time we get to the clinic, we have an established ask here that we can probe our patients with and so.

0:5:13.350 --> 0:5:17.520  
David Soto  
It starts, you know, years before 1st in human.

0:5:19.650 --> 0:5:37.250  
Angela Angle  
I guess is the ultimate goal to identify the right biomarkers potentially using mass spec early in development or the preclinical stage. So that when you get to clinical testing, you can just use a few immunoassays rather than mass spec or as mass spec still being used at the clinical stage.

0:5:38.190 --> 0:5:56.940  
David Soto  
Nespak can still be used at the clinical stage. It's obviously nobody's preferred option, but if this is the best way to, you know, detect your dog or detect specific proteins as biomarkers, it can be used, but it's obviously better to avoid mass back.

0:5:59.270 --> 0:6:10.400  
Angela Angle  
And if you're looking for for, for example, you mentioned using Mass Effect to detect your your protein with this P for like a PK PD type essay or or what's the specific purposes of these tests?

0:6:11.580 --> 0:6:14.670  
David Soto  
Yes, that would be a determining your you know the.

0:6:14.760 --> 0:6:39.790  
David Soto  
A YOUR drug pharmacokinetics the metabolites of your drugs or things like that. However, there's also a completely different views which is detecting certain proteins in plasma that can serve as predictors of response in these proteins. Not being the drug target or the drug or anything else, it's something that's associated with the.

0:6:40.940 --> 0:6:42.640  
David Soto  
Potential efficacy of your drug.

0:6:44.310 --> 0:6:44.720  
Angela Angle  
OK.

0:6:46.570 --> 0:7:7.0  
Angela Angle  
And for for a I guess I'm a more specific type of proteomics we're interested in is spatial proteomics, and we're curious where in the stage of development what stage of development spatial proteomics you see being used, and are there certain therapeutic areas where spatial proteome mixes seeing more interest?

0:7:13.70 --> 0:7:13.290  
Angela Angle  
Umm.

0:7:9.20 --> 0:7:39.20  
David Soto  
So we are already you actively using spatial periodics I I can't say that we're all experts. It's it's only been around for a few years, but special party US Spatial party omics is a good way to identify potential responders in oncology. Spatial periodics can be used to test baseline partiotic signatures in tumor samples from oncology patients and then associate.

0:8:0.260 --> 0:8:0.570  
Angela Angle  
Umm.

0:7:39.360 --> 0:8:9.590  
David Soto  
And then if these signatures can be associated with the sensitivity of the patient to the drug, then they can lead to discovery of potential development of potential companion diagnostics. Now this work again, it's better to start this work earlier in preclinical development and of course you may ask how would you want patient samples, would you use. So what we do is we would apply spatial proteomics.

0:8:9.680 --> 0:8:31.740  
David Soto  
To patient derived xenografts grown in mice and we would use this in a preclinical setting, then we would also validate these signatures in independent patient samples regardless prior to start of our clinical trials for frequency or prevalence of these signatures. And then when we go to the clinic, we would have the.

0:8:32.410 --> 0:8:43.750  
David Soto  
You know, I would be we we will have done our best to study the prevalence and the association of these markers. So we would be probing our patients in a very targeted way.

0:8:44.430 --> 0:8:57.360  
Angela Angle  
Umm. And outside of solid tumors, are there any other areas? I guess what an example I'm curious about is autoimmune diseases or is there anything else that I'm not thinking about that you see spatial proteomics playing a role?

0:9:5.370 --> 0:9:5.660  
Angela Angle  
Mm-hmm.

0:9:16.410 --> 0:9:16.750  
Angela Angle  
OK.

0:8:59.820 --> 0:9:20.400  
David Soto  
Well, facial makes a lot of sense in solid tissues, right? So in autoimmune disease, I mean, you would likely, I mean, for practical considerations, you will likely be getting blood samples, not tissue samples from the patients, right. So you can look at things like.

0:9:21.460 --> 0:9:29.450  
David Soto  
Your immune response using, you know proteins and plasma and things like this, but it's unlikely that you would get tissue samples.

0:9:30.230 --> 0:9:31.290  
Angela Angle  
OK. That makes sense.

0:9:32.620 --> 0:9:43.190  
Angela Angle  
When you're performing spatial proteomics on like a tumor tissue sample, are you also performing spatial genomics or transcriptomics assays? And that same sample?

0:9:45.250 --> 0:10:0.300  
David Soto  
Not always, but transcriptomics plus probiotics is a is a good way to look at things. Usually the transcriptomics is the first one to produce leads and then part of the Alex is often used to.

0:10:0.640 --> 0:10:2.440  
David Soto  
Uh. Validate them?

0:10:4.470 --> 0:10:12.660  
Angela Angle  
OK, so the first step is typically to perform the transcriptomics assay and then do more detailed per spatial proteomics afterwards.

0:10:20.810 --> 0:10:21.130  
Angela Angle  
Umm.

0:10:14.300 --> 0:10:30.560  
David Soto  
Uh, yeah, that is the most logical way to do it from the sort of analysis standpoint. But you know, there are. There are assays like that do both Nanostring and Coia that you can probe for both.

0:10:32.310 --> 0:10:32.660  
Angela Angle  
OK.

0:10:50.120 --> 0:10:51.30  
David Soto  
Yep, drew lines.

0:10:34.520 --> 0:10:51.790  
Angela Angle  
The moving to amino acids. I'm curious what kind of platforms are are most commonly used in the the preclinical and the clinical stages, some that we've seen that or or heard about our MSD gyro or gyro labs, old link and maybe some other ones.

0:10:53.150 --> 0:10:57.280  
David Soto  
All link is a very common one. All link, yeah. So I'm aware of all of these.

0:10:57.970 --> 0:11:6.620  
David Soto  
Uh, you know, these have been around for some time. These certainly Jaro and MSD and the scale but.

0:11:6.960 --> 0:11:34.310  
David Soto  
Uh, owing is in your essay, but it's developed very, very nicely, and the distinguishing feature of olink is the increased specificity, reduced cost reactivity due to the fact that they are using two antibody binding events with a proximity extension assay. All Link is an interesting assay and they also have very convenient ready to go panels for various these areas. So it's a promising.

0:11:35.630 --> 0:11:36.130  
David Soto  
Nothing.

0:11:37.870 --> 0:11:48.490  
Angela Angle  
So if I will link as strong and specificity are the other platforms stronger and other aspects like throughput or sensitivity or or or what would be the driving factor to use a different platform?

0:11:52.540 --> 0:11:53.490  
David Soto  
Uh.

0:11:55.200 --> 0:12:7.950  
David Soto  
That is a very broad question. I'll try to answer. I mesoscale which is MSD is generally known to be ultrasensitive in some settings.

0:12:9.70 --> 0:12:12.680  
David Soto  
So because of the electric, you know, signaling enhancement.

0:12:13.280 --> 0:12:15.560  
David Soto  
Umm so.

0:12:16.150 --> 0:12:46.640  
David Soto  
Ohh yeah, I would say that's probably. That's probably it here. I mean if you if you're looking at single cell separation, quanterix is another interesting aspect. It really depends on what you're looking for. If you're looking to isolate the individual cells and do that analysis, that would be quanterix. There's another essay that's very interesting by a company called ISO Plaxis that can isolate individual immune cells into separate compartments.

0:12:46.710 --> 0:12:59.650  
David Soto  
And then look at the kinetics, the timeline of secretion of different side of kinds by these cells independently. So you get a very granular picture of immune response, so.

0:13:1.110 --> 0:13:6.390  
David Soto  
Yeah, but for, you know, for specificity, I would, I would, I would, I would look at olink for sure.

0:13:7.150 --> 0:13:30.480  
Angela Angle  
Umm, OK and getting a little bit ahead to, I guess outsourcing zeros when you do look for a partner who could perform these types of immunoassays, are you looking for them to have off the shelf panels on these different platforms or you typically designing some sort of custom assay with them or have an assay developed internally that you then transfer over to them to run?

0:13:32.150 --> 0:13:44.600  
David Soto  
Well, we would like to have both. I mean both are very useful off the shelf is something that you know like the 96, you know oncology panel by Oleg. I mean that's something that you use more and they discovery setting.

0:13:45.120 --> 0:13:50.450  
David Soto  
Uh, and that's convenient because it's just basically, you know, by it it's the advantage of these.

0:13:50.560 --> 0:14:1.270  
David Soto  
Umm you know pre designed panels is that the well validated usually literature and white papers and you get one and you profile everything.

0:14:3.30 --> 0:14:8.380  
David Soto  
Custom you need it often, but that's you know, when you get certain degree of.

0:14:9.540 --> 0:14:22.10  
David Soto  
Getting some confidence in the platform. Then you you can you can start doing this and all link can do that, but it's it's not. It's not a. It's not a quick easy process to validate those. Be prepared for three to six months.

0:14:24.70 --> 0:14:25.370  
Angela Angle  
OK. That makes sense.

0:14:26.590 --> 0:14:55.960  
Angela Angle  
I did want to move to another type of testing. What other kind of category that we're interested in is the immune monitoring, testing and here we're including things like flow cytometry or other cellular phenotyping, types of assays. And for here curious on just your general thoughts on the trends of forming immune monitoring, testing the next three to five years or there are certain types of tests that you see being more important in the coming years or less important?

0:14:58.830 --> 0:15:2.430  
David Soto  
Umm, you know, it's it's a little bit harder here to.

0:15:11.540 --> 0:15:12.40  
Angela Angle  
That's fair.

0:15:3.180 --> 0:15:15.320  
David Soto  
Yeah. Identify. Sort of trends and speak eloquently to this, because both symmetry has been around for a long time, right? So I mean, we've been, we've been using it.

0:15:15.940 --> 0:15:31.650  
David Soto  
You know? Yeah. I mean, you can, you can say to use has increased but it's nothing like in comparison to all the other things the other technology you were asking about there are all really underlies and their new and people are excited. I mean both the toiletries. Yeah, you.

0:15:32.370 --> 0:15:33.320  
David Soto  
Uh.

0:15:34.560 --> 0:15:41.800  
David Soto  
It's a it's a good way to profile your immune cells, and it's not super high throughput, it's not super.

0:15:41.880 --> 0:16:6.570  
David Soto  
Yo diagnostic friendly, but yeah, you do it and you do other things. It's not just a little profile, you use photometry to also detect it. Anthology to detect a specific cell types in patients, liquid biopsies such as circulating and the filial cell circulating tumor cells. These users are actually increasing. So one could argue that this is that could be considered a.

0:16:7.50 --> 0:16:9.680  
David Soto  
You know, you were growth area.

0:16:10.370 --> 0:16:10.730  
Angela Angle  
Umm.

0:16:11.980 --> 0:16:26.60  
Angela Angle  
And for, I guess is probably gonna depend on your your stage of development, but I'm curious what your you see the use for spectral flow cytometry or or site off some of these higher Plex types of flow cytometry?

0:16:26.310 --> 0:16:32.640  
Angela Angle  
Umm, how do you and just how are you using these today and how do you expect that the change if at all the next three to five years?

0:16:34.900 --> 0:16:37.890  
David Soto  
I would say that's more of a.

0:16:39.220 --> 0:16:54.980  
David Soto  
We're using them again for immune cell profiling in different settings. I would say I would expect this to grow with kind of the rising tide of biomarkers lifting all boats, so to speak, but.

0:16:56.360 --> 0:17:1.280  
David Soto  
Again, I don't think this will be the most, you know, practical the most.

0:17:2.780 --> 0:17:11.200  
David Soto  
Convenient platform. So we would probably look to use it to discovery and then switch to something practical for companion diagnostics.

0:17:13.140 --> 0:17:25.530  
Angela Angle  
Do you see any use of this of either spectral or setoff in preclinical or clinical testing or do you think you either switch to conventional flow cytometry or some other method by the time you get to those stages?

0:17:26.980 --> 0:17:29.150  
David Soto  
By the time we get to clinical, probably, yeah.

0:17:30.30 --> 0:17:53.460  
David Soto  
In preclinical, yeah, you can still if you know, I mean it's it's still common. I mean I kind of pictured that more ideal situation when you're all ready to go with good assay by the time you start, it doesn't always happen that way. We strive to achieve that. But yeah, in preclinical, you can still have discovery based testing and then even in early clinical.

0:17:55.440 --> 0:18:7.210  
Angela Angle  
And then the Discovery Bayes or or even preclinical phase, what's the typical number of markers, I guess that you're looking for for an experiment, does it often justify the needs for these types of instruments?

0:18:10.950 --> 0:18:25.750  
David Soto  
I mean, you could be, you know, what, a dozen or so, or I mean up to 18. I don't know if it justifies. Yeah, it's not the most convenient way to do that. But yeah, I mean, you could be within the reasonable more than definitely more than two or three.

0:18:26.930 --> 0:18:27.350  
David Soto  
Color.

0:18:29.990 --> 0:18:36.480  
Angela Angle  
Are you seeing any preferences for spectral flow versus saitov or these kind of scenes interchangeable?

0:18:38.80 --> 0:18:39.280  
David Soto  
Umm.

0:18:46.70 --> 0:18:46.410  
Angela Angle  
Hmm.

0:18:40.230 --> 0:18:53.100  
David Soto  
More interchangeable? I can't say we're happy users anyway. Either way, this is something that we have relied on suppliers for. We we never actually stablished internal capability.

0:18:54.320 --> 0:18:55.510  
Angela Angle  
OK. That makes sense.

0:18:57.480 --> 0:19:16.750  
Angela Angle  
Then I just have a few questions around genomic space testing in here. We're including PCR as well as the transcriptomics genomics epigenomics. Here I'm curious for clinical trials where you're often where your most seeing the use of genomics testing for biomarkers.

0:19:18.830 --> 0:19:41.950  
David Soto  
It is in oncology, so if you're questions about TA's, it's hands down and in acology because obviously you know cancer is a genetic disease. So for efficacy for pharmacogenetic type testing for snips and things like this that you can do in an ETA immunology, immune disease is gaining some ground.

0:19:42.460 --> 0:20:5.330  
David Soto  
Umm, I think we're the earlier stages, but in our ecology it's it's a heavy oncology, that very heavy user of all the genomics transcriptomics tools. Anytime you can get your hands on any type of patient sample liquid biopsy, real biopsy, anything, you absolutely test it, you squeeze maximum information however.

0:20:7.580 --> 0:20:26.890  
Angela Angle  
And could you elaborate a little bit more on like the specific use cases for the genomic biomarker testing? I mentioned there's there's some in sort of the patient identification for specific types of cancers with certain mutations. But in terms of responding to treatments, how these tools are used?

0:20:27.990 --> 0:20:57.580  
David Soto  
Yeah, yeah, yeah. That is exactly the main case. So we call this the patient selection biomarkers. So what we typically do is we start early in preclinical phases or even discovery phases. We create a panel of preclinical models. I'm intentionally being general here. So preclinical models could be.

0:20:57.670 --> 0:21:19.270  
David Soto  
As simple as 2D cell lines or 3D organoids or later on patient derived xenografts. So in that panel we test them so that we test the whole panel for sensitivity to our drug and we profile that panel genomically partial medically.

0:21:19.520 --> 0:21:26.950  
David Soto  
Ah, next Gen. sequencing PCR, other assays and we correlate the presence of certain.

0:21:27.290 --> 0:21:58.90  
David Soto  
Uh signatures mutation gene amplifications gene dilutions, gene expression signatures and such with sensitivity to a drug that leads us to discover candidate biomarkers for patient selection, which we then take to the clinic. We progressively take them through different stages, maybe cell lines, then they should drive Genographic things get harder to do and more expensive later on. But eventually when we arrive at.

0:21:58.190 --> 0:22:28.640  
David Soto  
A, you know, clinical stage of testing. Then we hope to already have a well defined signature, something that's more measurable, something that's more practical than just a whole whole transcript to sequencing or something like that. And there we test our patients and we validate hopefully our biomarker and we use it for patient selection. So the idea is to develop a companion diagnostic.

0:22:28.780 --> 0:22:37.190  
David Soto  
That would allow us to select patients for treatment, but that would drug. So that's kind of the full cycle of years and years of work.

0:22:39.330 --> 0:22:50.220  
Angela Angle  
Are you are I guess? Where are you seeing use of NGS in clinical trials if if at all, by the stage you're you're limited to single PCR Q PCR tests?

0:22:56.860 --> 0:22:57.220  
Angela Angle  
Umm.

0:22:51.740 --> 0:23:12.530  
David Soto  
We that's that is again kind of what we strive to achieve right by we hope to be already have a signature and do it with qPCR with during clinical stages. But very often we that's the work still continues in discovery so and plus.

0:23:12.720 --> 0:23:44.140  
David Soto  
You know, in addition to what we already have through this Q PCR based signatures, we can still, if we have enough patient sample, we would still sequence for additional information. So again the the real bottleneck, the real driver of everything here is the availability of patient material. If we have a plentiful biopsy samples and even if we already have a signature and we have leftover material, we would still sequence that. So I do see a.

0:23:44.230 --> 0:24:0.970  
David Soto  
Very significant role for next Gen. sequencing in clinical trials in oncology, very significant role. The only limitation to how much we of this we would do these days, it's not the cost of the sequencing, it is the availability of patient material.

0:24:3.440 --> 0:24:15.60  
Angela Angle  
Are you you mentioned liquid biopsies earlier. Are you performing liquid biopsies as part of the trials for monitoring efficacy and of drugs or is this mostly for patient selection?

0:24:18.520 --> 0:24:31.380  
David Soto  
We are using a liquid biopsies for both the use for patient selection is based on the. Again the presence of certain signatures that might be predictive of response.

0:24:32.520 --> 0:24:32.820  
Angela Angle  
Umm.

0:24:34.160 --> 0:24:44.570  
Angela Angle  
And then you might look for during a trial during the course of treatment, you may take samples to monitor. Can you monitor the response with the biopsy then as well?

0:24:46.140 --> 0:24:49.500  
David Soto  
Uh, you can. The rationale there would be the.

0:24:49.580 --> 0:24:52.10  
David Soto  
The arising.

0:24:53.840 --> 0:25:0.860  
David Soto  
Uh. Signatures of resistance. Yes. So what? You what? You have the liquid biopsy in a traditional setting would show you the.

0:25:2.820 --> 0:25:8.200  
David Soto  
So it's a MRD minimal residual disease especially in certain.

0:25:9.380 --> 0:25:28.710  
David Soto  
Try the logical oncology hematological cancers. Now the appearance of circulating tumor DNA or circulating tumor cells with the resistance patterns is also a useful tool for monitoring the disease, because that can tell you that.

0:25:28.790 --> 0:25:34.990  
David Soto  
The cancer cells are becoming resistant to your drugs and you're likely to see a recurrence.

0:25:37.580 --> 0:25:46.690  
Angela Angle  
Are liquor biopsy tests something that you often develop internally or is this something that you rely more on a CRO or other partner to help develop?

0:25:49.380 --> 0:25:55.360  
David Soto  
Umm, both I we try I mean I would say it's you know maybe 5050.

0:25:57.220 --> 0:25:57.560  
Angela Angle  
OK.

0:25:59.110 --> 0:26:17.660  
Angela Angle  
I'm just a couple kind of overall questions on the use of biomarkers as a little bit earlier on the use of spatial genomics and transcriptomics on the same sample. But I'm curious on for some of these other tests that we've talked about and others that we did mention, how common is it to perform?

0:26:18.290 --> 0:26:22.250  
Angela Angle  
Different types of biomarker tests on the same sample and.

0:26:23.240 --> 0:26:25.40  
Angela Angle  
What are the most common use cases for that?

0:26:28.320 --> 0:26:42.900  
David Soto  
Hmm. Well, you can. Yeah, you can perform transcriptomics and proteomics on the same sample. The most common use for this is discovery. Really. You're it's a fishing expedition you test for.

0:26:43.810 --> 0:26:52.290  
David Soto  
Yeah, whatever. You think your candidate markers are and you see what comes out of it. It's it's usually that earlier stages of discovery.

0:26:54.800 --> 0:27:1.50  
Angela Angle  
Are there any therapeutic areas or modalities where some of these multi Omega approaches are more common?

0:27:3.170 --> 0:27:6.420  
David Soto  
Again, it's oncology because of the availability of samples, right?

0:27:7.50 --> 0:27:11.350  
David Soto  
So like you know, the only realistic situation where you got a patient?

0:27:11.430 --> 0:27:13.850  
David Soto  
So patient tissue is.

0:27:15.130 --> 0:27:18.590  
David Soto  
Cancer and other diseases. You, you just. You don't have that.

0:27:19.860 --> 0:27:20.990  
Angela Angle  
Yeah, makes sense.

0:27:22.350 --> 0:27:30.980  
Angela Angle  
OK, I'd like to move a little bit towards discussing the the outsourcing of the different types of biomarker testing. You mentioned that.

0:27:31.370 --> 0:27:41.740  
Angela Angle  
Ohh, sort of 5050 on the work that's outsourced. So I'd like to go a little bit more in detail on what comprises the 50% that is outsourced. Are there certain?

0:27:42.320 --> 0:27:58.850  
Angela Angle  
Uh instrument platforms or technologies that you may not have internally that you like to outsource? Or is there pacity issues that determine what sorts of testing to outsource, just like to learn a little bit more about what determines whether a test will be outsourced or not?

0:28:1.360 --> 0:28:10.350  
David Soto  
The drivers of outsourcing, specifically in in sort of this biomarker space, right, the genomics proteomics, right?

0:28:10.340 --> 0:28:10.810  
Angela Angle  
Yes.

0:28:14.560 --> 0:28:18.670  
David Soto  
Well, there are two major drivers. I guess one is.

0:28:21.670 --> 0:28:39.90  
David Soto  
One is capabilities accessing new technology, new platforms. So if you're not ready to buy, you know a nice plexus or quanterix machine, you basically send your samples out and you'll learn how it works and.

0:28:39.170 --> 0:28:39.490  
David Soto  
Uh.

0:28:40.40 --> 0:28:47.670  
David Soto  
Yeah, you expand your toolbox, the other, the other driver is.

0:29:3.870 --> 0:29:4.150  
Angela Angle  
Umm.

0:28:49.90 --> 0:29:16.400  
David Soto  
Efficiency and capacity it related to I guess reasons here you have two choices. You either build up their capacity to deal with the highest work volume, which is hard to predict right because you're running multiple clinical trials, you're getting samples and you know sometimes they come in in large batches and you need quick sponsors and then you're down. You're not doing anything for, you know, three months so.

0:29:17.590 --> 0:29:30.500  
David Soto  
You can tell it's not super efficient, so you kind of you usually staff to a some sort of an average or column and you manage preclinical bluff clinical and then you know if you have you know you go and you outsource if you have.

0:29:31.700 --> 0:29:44.790  
David Soto  
Increased work volumes now also that's the second reason. The third reason would be to really prepare for developing more validated GLP phase to go to the clinic later maybe manage.

0:29:46.100 --> 0:30:6.180  
David Soto  
Dell companion Diagnostic development and things like this, so you could, you know, call cellcarta and and work with them on that. And basically it's out of your hands and they're adding this and whatever happens later, you go to phase three and you get more samples than the managers and gelp environment, things like that. But yeah, I guess these are the generic reasons.

0:30:7.800 --> 0:30:21.490  
Angela Angle  
For the GOP assays, is this how? How often do you develop the GOP assays internally or is this something that you typically outsourced because then you're gonna have the test performed in the the external GLP laboratory?

0:30:23.20 --> 0:30:24.790  
David Soto  
It's that is always outsourced.

0:30:26.0 --> 0:30:26.350  
Angela Angle  
OK.

0:30:28.620 --> 0:30:49.160  
Angela Angle  
And for the non jail P tests, I guess so there's certain how frequently do you prefer develop the assays internally and then transfer that over to a CRO. Are there certain types of bond market tests like proteomics or amino acids or genomics that you're more likely to develop internally rather than having someone else develop the essay?

0:31:0.300 --> 0:31:0.570  
Angela Angle  
Umm.

0:30:51.680 --> 0:31:4.280  
David Soto  
So I think that would be very company specific. That's something you'll probably would want to average across, you know, different interviews because in reality that depends on your kind of internal.

0:31:6.560 --> 0:31:25.580  
David Soto  
Yeah, I'll internal capabilities. I mean I my experience is more with you know, developing genomic assays internally because that's where we consider genomics. Plus transcriptomics is a particular area of strength. So but you know, for somebody else that would be probiotics or something else, so.

0:31:27.80 --> 0:31:30.290  
David Soto  
It's really driven by, you know what, what you do best.

0:31:31.580 --> 0:31:32.10  
Angela Angle  
Mm-hmm.

0:31:31.410 --> 0:31:36.180  
David Soto  
And and you you develop it yourself and then eventually you might transfer it.

0:31:38.460 --> 0:31:39.570  
Angela Angle  
Yeah, that makes sense.

0:31:41.300 --> 0:31:55.880  
Angela Angle  
And then I guess it if there's a newer platform like you mentioned olink is something that's something newer that came out that that may be something that you may wanna trial with an external vendor before choosing to purchase that and and bring it in house.

0:32:0.170 --> 0:32:24.0  
David Soto  
Yeah, you sometimes you know if it's a new platform like quanterix for example, they they sell, you know their assays, equipment and then they also run them or you can run them somewhere else. So it's always helpful to reach out and send some samples out and 1st see how that works and then make your decision on capital investment later.

0:32:25.260 --> 0:32:25.560  
Angela Angle  
Mm-hmm.

0:32:26.520 --> 0:32:26.910  
Angela Angle  
OK.

0:32:28.30 --> 0:32:40.320  
Angela Angle  
And that 50% of work outsource does this, is this higher for Discovery R&D work versus preclinical versus clinical stage work or how does that change across the the development spectrum?

0:32:44.320 --> 0:33:8.20  
David Soto  
Preclinical versus clinical mean it would be somewhat uneven. I I don't know maybe more in clinical then because the workload becomes less predictable and because you're closer to kind of feel more validated diagnostic assays. So possibly pier in clinical, but it would also vary.

0:33:8.870 --> 0:33:9.140  
Angela Angle  
Umm.

0:33:9.430 --> 0:33:11.230  
David Soto  
Later stages of clinical for sure.

0:33:12.660 --> 0:33:12.990  
Angela Angle  
OK.

0:33:14.600 --> 0:33:23.310  
Angela Angle  
Is there any impact on the drug modality like a cell therapy or an antibody that determines if it's you're gonna outsource more or less testing?

0:33:29.860 --> 0:33:31.230  
David Soto  
But doggy.

0:33:32.410 --> 0:34:4.340  
David Soto  
It's testing will be outsourced. Not really, you know, with biomarkers, it's not as what else. I mean, earlier in the conversation, we talked about different assays like maybe all these immunogenicity and you drug antibodies, that's something that's specific to biologics. But that's not exactly biomarkers, that's a different type of testing that obviously is skewed towards biomarkers, maybe some like immune specific \*\*\*\*\* would be skewed to, but again, but that's what I started with. I said, look.

0:34:4.660 --> 0:34:21.390  
David Soto  
If you want to look for a very fine you know differences, then yes, maybe for these types of issues. But generally biomarker work, I mean whether you have a small molecule or biologic, you're gonna have to do a lot of it and that's what's increasing anyway, for every drug category.

0:34:23.990 --> 0:34:42.690  
Angela Angle  
If you engage CRO to develop an assay for you, maybe in the preclinical stage and then using clinical development, do you typically continue to have that zero, then perform that essay as you progress through clinical trials including late stage trials or do you switch to a different zero to perform testing later?

0:34:44.760 --> 0:35:14.800  
David Soto  
Umm, so if it's a complicated ask and it sounds like most of your you know interest here is in more sophisticated assets than you likely would keep it with the same vendor. If it's something that's doable transferable and more or less common than combining the work with the clinical Pro is a good idea. You know how Icon or Covance?

0:35:14.870 --> 0:35:24.730  
David Soto  
To run your clinical trial and you know these big cyros have a lot of logistical issues and executional.

0:35:25.670 --> 0:35:55.420  
David Soto  
Issues with the offending samples and labeling samples losing them, so it's better not to introduce that extra level of complexity if they can do it in their own central labs, especially if you're doing phase two phase three development with a large geographic footprint and you're sending samples from Asia to whatever, whatever your love is, it's better to keep it with the clinical Sharrow. But again, if you're asking is complex enough and it's specific to that company that developed it and then you keep it with them.

0:35:57.80 --> 0:35:59.480  
David Soto  
In some rare cases, you can internalize it too.

0:36:0.840 --> 0:36:24.300  
Angela Angle  
Umm. And for some of the companies that you mentioned, bio and bioagilytix Alta Sciences cell Carta, that if if these companies are developing your assays and performing assays is, do you see any benefit for them to expand and to having offering central lab services so they can I guess compete with the testing being done by Icon Covance other people.

0:36:28.970 --> 0:36:32.610  
David Soto  
Hmm. Compete. Sorry, I'm not sure I understand.

0:36:33.280 --> 0:36:38.350  
David Soto  
They would be the ones to develop them. That's that's Covance would not be developed in this Abscess.

0:36:40.30 --> 0:36:43.670  
Angela Angle  
I guess something someone like Covance, they may have the.

0:36:44.350 --> 0:36:47.270  
Angela Angle  
The other central lab capabilities to perform more.

0:36:48.170 --> 0:36:51.580  
Angela Angle  
I guess generic or commoditized assays?

0:36:52.550 --> 0:36:53.500  
Angela Angle  
Did you see?

0:36:54.340 --> 0:37:12.530  
Angela Angle  
Like uh, I guess, for example, they're doing some sort of metabolic panels or other baseline tests of of patient samples. Do you see any benefit in someone like bioagilytix or cellcarta bringing in that type of testing to complement the more specialized biomarker essays that they are already performing?

0:37:16.640 --> 0:37:19.590  
David Soto  
Sure. Yeah, I why not?

0:37:19.670 --> 0:37:20.240  
David Soto  
Umm.

0:37:21.790 --> 0:37:41.550  
David Soto  
If if they are capable, I mean if you have kind of if you have a company like bioagilytix or QPS or altasciences on board, they can certainly do a biomarker plus basic basic pick and other things. And yes, in some cases we've combined that type of work with one vendor, yeah.

0:37:43.260 --> 0:37:53.240  
Angela Angle  
Is it? I guess if you're thinking about who to choose for the biomarker assay development for some of these more complex tests with the?

0:37:54.40 --> 0:38:13.110  
Angela Angle  
Offering of Central lab services be differentiating enough that you might choose one company like QPS over bioagilytix just because they can perform those additional tests for you? Or is it really the specialized biomarker testing development that you really wanna get right that determines who you select for this work?

0:38:14.630 --> 0:38:18.550  
David Soto  
Well, the specialized is if there's only.

0:38:18.820 --> 0:38:48.900  
David Soto  
You know it is the main differentiator. However, your overall history of your quality, execution, agility and other things, they also become. They are also factor so, but yes, most of the differentiation is along the lines of more complex especially the assay development piece. So executing a ready to grow validated assay well that's most companies can do it reasonably well.

0:38:49.100 --> 0:38:59.710  
David Soto  
But you know, setting up that establishing that, I mean you can you can some companies would you know can do it in three to four months and others will take 12 months. So I would I would focus on that.

0:39:2.130 --> 0:39:13.100  
Angela Angle  
When you select a zero to do custom assay development, what sort of evidence or proof do you look for from them to to know whether they can handle your specific requests?

0:39:17.440 --> 0:39:18.770  
David Soto  
Uh.

0:39:21.220 --> 0:39:23.470  
David Soto  
So we would pick the.

0:39:24.830 --> 0:39:25.640  
David Soto  
Uh.

0:39:27.60 --> 0:39:31.610  
David Soto  
We we would treat it as two separate work streams. We would be looking for.

0:39:32.0 --> 0:39:56.760  
David Soto  
You know the traditional asset execution that became assays and provider based on certain set of criteria and then we would be looking for biomarkers. In fact this would often be the different team internally looking for a provider to do these specialized proteomics assets for patient selection. I'm not sure if I don't know if I'm answering your question with this, that's how we manage that.

0:39:58.810 --> 0:40:18.980  
Angela Angle  
Yeah, I guess I'm just curious on when you're evaluating which vendor to choose. Like, are you gonna choose biogenetics or QPS? What sorts of to to do some sort of asset developments? Do you look for, I guess, what sort of expertise do you look for and and how do you evaluate which one you ultimately choose?

0:40:20.740 --> 0:40:30.650  
David Soto  
We would be looking, we would be talking to them about this specific issue would be reaching out to the technical people and talking about their expertise and track record with the specific.

0:40:30.780 --> 0:40:42.820  
David Soto  
Uh, you know technology and looking at you know it's it's it's that you know the equipment and the people people being more important.

0:40:42.960 --> 0:40:55.590  
David Soto  
Uh in their track record. So we would be, you know, comparing that and I guess with specialized assets, it's going to be a kind of when it does.

0:40:56.730 --> 0:41:25.170  
David Soto  
Uh, a your conversation every time. And we do have some internal expertise, so it would be an easier conversation, you know, professional to professional, talking about, you know, let's say transcriptomic analysis. How do you do it? Which platform do you use? What are the examples from your recent work and and then that would be an early conversation prior to any kind of RFP going forward.

0:41:27.410 --> 0:41:28.80  
Angela Angle  
That makes sense.

0:41:29.40 --> 0:41:54.820  
Angela Angle  
For some of the different types of essays that we talked about. So I guess proteomics, amino assays, genomics, styleby tests, what benefit is there for outsourcing all of these tests for a given asset to the same 0 versus saying 01 can handle all my proteomics 02 can handle all my genomics? Is there really a driver to have all these types of biomarker testing centralized?

0:41:57.880 --> 0:42:9.430  
David Soto  
So there is a driver for combining things in one PO for sure. I mean one of these drivers of course is is the cost which you you get volume discounts the other.

0:42:9.890 --> 0:42:10.350  
David Soto  
Umm.

0:42:11.440 --> 0:42:21.120  
David Soto  
The other benefit is of course, you know if you've evaluated somebody'd expertise and they do well with technology.

0:42:22.60 --> 0:42:28.330  
David Soto  
You know, and if they have shown good results and then then you basically you trust them so however.

0:42:28.780 --> 0:42:29.300  
David Soto  
Uh.

0:42:30.540 --> 0:42:59.310  
David Soto  
This is in conflict with. You know the other type of bundling, which is by drug and by area of science. So if you talk to somebody like cellcarta for example, then if they understand the mechanism of that drug or the specific disease mechanism or something, then perhaps you should be combining not by technology, genomics, separately, separately and everything else but by.

0:42:59.470 --> 0:43:8.340  
David Soto  
There you are fines and having them do apply different technology, but being assigned experts so it's not an easy question to answer but.

0:43:9.500 --> 0:43:17.840  
David Soto  
As you can tell, my bias would be for the letter which is combining by science rather than by technology experience whenever possible.

0:43:18.670 --> 0:43:33.700  
Angela Angle  
Umm. So in that case, would you see some zeros as these are oncology focus zeros or these are immunology or infectious disease or other therapeutic area type of focus and that's how you would evaluate or look at them in terms of expertise.

0:43:36.90 --> 0:43:52.880  
David Soto  
Umm, I think that would be going too far. I would say I would look at them and I would. I would see you know what technologies they have on board. But so if you take expertise would be an important secondary factor. I mean again using my example of self.

0:43:52.960 --> 0:44:15.460  
David Soto  
But I mean all immune disease and oncology would be the key areas of expertise for sure. At the same time, you know, yes with technologies it will be mostly proteins that's going to be mass spec. Alice bought Elisa all Lync, they can do nano shining and things like this. So that would be a good kind of example and similarly.

0:44:16.110 --> 0:44:21.920  
David Soto  
Do nomics, so that's a good example. So so I guess there's a combination of.

0:44:22.480 --> 0:44:26.900  
David Soto  
Well, both, you know therapeutic and technology experience.

0:44:28.690 --> 0:44:48.340  
Angela Angle  
Yeah, right. I think for the rest of the call, we helpful to move into some of the specifics heroes and in your view of them, I I guess and we're just talking about, so Carta mentioned that they're really good at proteins and proteomics and also genomics. And just curious like overall like what you see as their differentiating factors versus some of the other zeros that you mentioned?

0:45:0.630 --> 0:45:0.890  
Angela Angle  
Umm.

0:44:50.280 --> 0:45:7.450  
David Soto  
I think they're differentiator is the scientific depth in genomics, poreotics anthology and already and disease. Really very simple. And there are unique focus on biomarkers unlike Bioagilytix or Alta sciences, they would not be your.

0:45:7.830 --> 0:45:32.320  
David Soto  
Ohh, you know PK and general, you know ADME. See RO, they would be your biomarker partner. So their expertise specifically in biomarkers, deep high level expertise, PhD level, you know scientists equipped with the right technologies including the all things like all link and data string not just the basic you know CNS.

0:45:33.480 --> 0:45:36.140  
David Soto  
I think that would be their main differentiator.

0:45:37.910 --> 0:46:4.670  
Angela Angle  
And I guess getting back to my question earlier on value or adding for example, central lab capabilities, that sounds like you view cell Carta is very strong in the biomarker space and that they don't stray outside of it and do peak testing if they if someone like them were to start offering some of these other types of testing. Do you view that as diluting their expertise in any way or as a negative to expand these into these types of services?

0:46:6.360 --> 0:46:6.650  
David Soto  
Huh.

0:46:7.430 --> 0:46:36.590  
David Soto  
Uh, well, it's up to that. Up to that, we see if they can add this as a separate unit and manage this without, you know, without my guess would using the quality of this I actually have, I have to admit, I've never seen anyone expand like this start as a biomarker company and then expand. So I don't have any experience with that in my 20 years but but you know if they can do it without.

0:46:36.740 --> 0:46:44.850  
David Soto  
Oh, I I don't like diluting the dilution is a perception here. So I would say if they continue to execute and if they can do other things, that's fine.

0:46:45.570 --> 0:47:6.440  
Angela Angle  
Umm, you mentioned from someone like bio agylitics that you're also outsourcing PK testing to them. What other types of testing or or other services related to development are you outsourcing to companies like this that are doing assay development and execution of these more specialized biomarker assays?

0:47:10.790 --> 0:47:16.620  
David Soto  
Umm, what are other like CRO players who can do both?

0:47:18.320 --> 0:47:19.240  
David Soto  
Ohh.

0:47:18.250 --> 0:47:20.560  
Angela Angle  
I guess we could talk about specifics.

0:47:31.580 --> 0:47:31.890  
David Soto  
Umm.

0:47:20.740 --> 0:47:34.370  
Angela Angle  
I'm specific heroes in a minute, but in general like Bioagilytix example that there in addition to biomarker testing, they're also doing PK testing. Are there other additional testing services or other clinical?

0:47:35.300 --> 0:47:47.770  
Angela Angle  
Services that could be broader as in, for example, logistics or clinical trial management, patient recruiting, like much broader types of services that these biomarker companies are also offering.

0:47:50.180 --> 0:47:53.470  
David Soto  
Well, bringing patient recruiting, that would be you know.

0:48:4.890 --> 0:48:5.210  
Angela Angle  
OK.

0:47:54.660 --> 0:48:13.890  
David Soto  
I don't know that that would be like bringing, you know, used car sales also to that. I don't know that to me that's a very separate type of expertise. I would say I would say logistics and servicing clinical trials is an interesting idea that has been.

0:48:14.630 --> 0:48:19.680  
David Soto  
You know, we've been we've been wanting this for some time to see.

0:48:20.680 --> 0:48:30.530  
David Soto  
You know, these companies get involved in logistics because as I mentioned before, the trouble with the current model, which is, you know, clinical fight monitoring.

0:48:30.610 --> 0:48:43.540  
David Soto  
Uh being combined with logistics and Central Labs, is that the large CRO's the Covance is of this world. They, you know, they have occasional issues with that logistics. So yeah, I guess.

0:48:43.690 --> 0:48:59.300  
David Soto  
Uh for selected services. I think that would be beneficial. I would love to see Bioagilytix kind of follow the model of, I don't know, precision for medicine, for example. And in yes include sample biospecimen management.

0:49:0.780 --> 0:49:8.710  
Angela Angle  
OK, that's really helpful. Are there any other services that you see as adjacent to biomarker testing that would be valuable if if these types of companies to offer?

0:49:11.640 --> 0:49:17.310  
David Soto  
Umm. Well I anything in the clinical space. I mean if you wanna if they want to start.

0:49:34.10 --> 0:49:34.280  
Angela Angle  
Umm.

0:49:17.930 --> 0:49:35.680  
David Soto  
Ohh well, let's see what would it be OK if if they wanna do phase one, I think that that would be an interesting one. So you basically bring in your build a phase one facility and you get into clinical because that one is all about PK, right? So we love it.

0:49:35.960 --> 0:49:39.560  
David Soto  
We love, we love it when you know the same company does.

0:49:39.640 --> 0:49:51.620  
David Soto  
Uh, uh. You know the patient volunteer recruitment and uses their own phase one facility. And does the laboratory work? That's a good combination.

0:49:53.730 --> 0:49:54.180  
Angela Angle  
OK.

0:49:55.890 --> 0:50:3.260  
Angela Angle  
So then I guess getting into some of the other zeros of mentioned bioagilytix a few times. What do you see as their differentiating features?

0:50:7.500 --> 0:50:9.340  
David Soto  
Bioagilytix S.

0:50:10.450 --> 0:50:21.890  
David Soto  
It's the really the scope of services. I think there are outstanding in a lot of their DMPK work. They do protein binding.

0:50:23.0 --> 0:50:23.990  
David Soto  
They look at.

0:50:25.130 --> 0:50:53.610  
David Soto  
You know various aspects of pharmacokinetics and immunogenicity is the core strengths. So they're getting into talks. So they do, they can run toxicology assays now. We haven't used that but service. But so it's really the breadth of services with pretty high quality. I mean, biologically, Biologics is an excellent company and they combine that with biomarker assess.

0:50:54.70 --> 0:50:57.320  
David Soto  
That marker expertise. So I would say that's probably.

0:51:6.540 --> 0:51:6.850  
Angela Angle  
Umm.

0:50:58.420 --> 0:51:28.250  
David Soto  
Probably the best example of that. I don't know if like that fits your you were asking about expanding from biomarkers to include other things without diluting things. So we'll biologics is as close as any company has gotten to this at least in from the companies I know. So I think that's an interesting example. They have great technology expertise. They have a lot of different proteomics machines. And so yeah, it's a respectable company.

0:51:29.210 --> 0:51:35.690  
David Soto  
And they acquired they also acquired, they are getting into this kind of you know getting closer to phase one.

0:51:37.430 --> 0:51:44.640  
David Soto  
Testing because they acquired that. What is it? 360 labs in Australia where a lot of companies do?

0:51:47.370 --> 0:51:48.310  
David Soto  
Phase 1 testing.

0:51:48.990 --> 0:51:49.220  
Angela Angle  
Umm.

0:51:50.530 --> 0:52:11.860  
Angela Angle  
Yeah. And I I realized it didn't uh ask about this as a factor earlier in zero selection button. Curious on your views of geographic scope. Are there certain geographies that you want your biomarker testing service providers to be playing in and or how important is it that they have additional labs for example not just in Europe?

0:52:16.810 --> 0:52:29.320  
David Soto  
Umm that is for FBA clinical trial related to FX execution. Yes because that would enable them to keep their essay and basically.

0:52:31.540 --> 0:52:49.280  
David Soto  
Yo resolve that issue that we have in transferring to large CRO's because if if they can guess it, they can have different labs if they can also add patient logistics then they can, they have a better chance of keeping that work. When we go to late stage clinical testing.

0:52:51.930 --> 0:53:5.480  
Angela Angle  
So for early assay development, does it matter what specific geographies that the the the labs are located in? Is it mostly just an once you get to clinical trials and are they're dealing with samples there that it's important?

0:53:6.650 --> 0:53:25.540  
David Soto  
Yes, exactly. It doesn't matter for for early there because the development is all in one lab as long as you can communicate with them. I mean we would prefer not to have that in Australia because 14 hour time differences can be inconvenient, but that that we prefer of course in the US, but if they do it in Europe, that's fine, we can manage.

0:53:26.320 --> 0:53:39.100  
Angela Angle  
Umm, you mentioned Australia? Or are there other locations in the APAC region that you're commonly conducting trials and see that a physical lab location may be valuable for biomarker testing?

0:53:42.90 --> 0:53:50.100  
David Soto  
So right now the the current mode of operation is. Is doing Asia from Australia.

0:53:51.580 --> 0:53:54.760  
David Soto  
But we do conduct a lot of trials in Asia.

0:54:5.850 --> 0:54:6.140  
Angela Angle  
Umm.

0:53:56.800 --> 0:54:18.10  
David Soto  
I Asia is diverse and complicated because some geographies in Asia have a lot of restrictions on cross-border biospecimen sending and it's yeah. So I mean, ideally, yeah, ideally if they could have webs in China and Taiwan, but that's that's rare.

0:54:18.90 --> 0:54:36.40  
David Soto  
Uh, I know some companies have. So these in Japan, that's great. But yeah, I mean ideally, but it's also not very practical. So right now a lot of this has been done sample from Asia, get tested in Australia.

0:54:38.700 --> 0:54:39.20  
Angela Angle  
OK.

0:54:40.640 --> 0:54:52.210  
Angela Angle  
The last couple minutes, uh, we talked a little bit more in detail about Cellcarta and bioagilytix, but just curious who else you see as those two companies strongest competitors and for for what reasons that would be?

0:54:54.180 --> 0:54:56.890  
David Soto  
Other than Cellcarta and bioagilytix.

0:54:58.30 --> 0:54:58.780  
David Soto  
Other companies.

0:54:57.810 --> 0:55:3.410  
Angela Angle  
Yeah. Who do you see as similar companies to there? That would be competitors to those two companies?

0:55:5.920 --> 0:55:10.500  
David Soto  
I would highlight Alta Sciences. They're very good about.

0:55:12.50 --> 0:55:12.890  
David Soto  
OK, work.

0:55:13.40 --> 0:55:13.930  
David Soto  
Ohm.

0:55:15.400 --> 0:55:19.0  
David Soto  
I would highlight Q ^2. I would highlight QPS.

0:55:19.420 --> 0:55:33.10  
David Soto  
Uh, in sort of QPS would be interesting because they will be able to do sort of like bioagilytix they can do biomarkers and some genomic work there as well, good math stack capabilities.

0:55:33.650 --> 0:55:56.880  
David Soto  
Umm and then you know you have these companies like quanterix and all link that actually you can send samples to. So these are mono technology companies I guess. But they execute very well. They advantages that they can really do a good job with that. Otherwise yeah about the sciences QPQ squared kcas is another one.

0:55:58.330 --> 0:56:9.710  
Angela Angle  
When do you choose to? You mentioned like quanterix. You can outsource assays for the Thunder to run on their own platforms. One would you choose that option versus a sero that has the Quanterix platform internally?

0:56:12.80 --> 0:56:18.330  
David Soto  
Usually it's when you're exactly set on that technology. When you used it in house and.

0:56:19.770 --> 0:56:26.350  
David Soto  
Yeah, that that is the one that works for your biomarker. You don't have any. You don't have any adjacencies.

0:56:56.280 --> 0:56:56.590  
Angela Angle  
Mm-hmm.

0:56:28.900 --> 0:56:57.290  
David Soto  
Then then that's a good solution because you know you can certainly trust them in in, you know, executing the right and also because you have a broader relationship they're going to, you know, they're going to be accountable if something goes wrong, they're going to rerun the samples or they're going to treat you well as a customer. So these are, but they're not going to have any logistics. That's the challenge there. Is that all that?

0:56:57.410 --> 0:57:3.720  
David Soto  
Other things with like, it's basically you sending samples to them and hand holding them through the process.

0:57:4.980 --> 0:57:6.910  
Angela Angle  
OK. That makes sense for helpful.