WEBVTT

NOTE duration:"00:29:27.1680000"

NOTE language:en-us

NOTE Confidence: 0.917529582977295

00:00:00.000 --> 00:00:02.820 But if you have additional questions,

NOTE Confidence: 0.917529582977295

00:00:02.820 --> 00:00:06.540 so let's now turn to our second Speaker.

NOTE Confidence: 0.917529582977295

00:00:06.540 --> 00:00:09.480 Doctor Ellen foxman is assistant professor

NOTE Confidence: 0.917529582977295

00:00:09.480 --> 00:00:12.378 of Laboratory Medison Ann Immunobiology and

NOTE Confidence: 0.917529582977295

00:00:12.378 --> 00:00:15.834 Ellen received her MD and PhD at Stanford.

NOTE Confidence: 0.917529582977295

00:00:15.840 --> 00:00:18.380 Her residency training in clinical

NOTE Confidence: 0.917529582977295

00:00:18.380 --> 00:00:20.920 pathology at Brigham and Women's

NOTE Confidence: 0.917529582977295

00:00:21.000 --> 00:00:23.640 Hospital before coming to yell and

NOTE Confidence: 0.917529582977295

00:00:23.640 --> 00:00:26.540 joining the faculty and Ellen is done.

NOTE Confidence: 0.917529582977295

00:00:26.540 --> 00:00:28.765 Extensive work now really understanding

NOTE Confidence: 0.917529582977295

00:00:28.765 --> 00:00:30.990 the immune responses and natural

NOTE Confidence: 0.917529582977295

00:00:31.058 --> 00:00:33.098 responses to respiratory viruses.

NOTE Confidence: 0.917529582977295

00:00:33.100 --> 00:00:34.670 Which is certainly a very

NOTE Confidence: 0.917529582977295

00:00:34.670 --> 00:00:35.926 timely topic of research.

NOTE Confidence: 0.917529582977295

00:00:35.930 --> 00:00:36.842 Uh, in 2020?

NOTE Confidence: 0.917529582977295

00:00:36.842 --> 00:00:39.355 So we were really pleased that Alan could

NOTE Confidence: 0.917529582977295

00:00:39.355 --> 00:00:42.208 take the time to share her research with us.

NOTE Confidence: 0.917529582977295

00:00:42.210 --> 00:00:43.462 So Ellen, thank you.

NOTE Confidence: 0.917529582977295

00:00:43.462 --> 00:00:44.400 Thank you. I'm

NOTE Confidence: 0.926282286643982

00:00:44.400 --> 00:00:45.636 happy to be here.

NOTE Confidence: 0.926282286643982

00:00:45.636 --> 00:00:47.490 And now I'm going to hopefully

NOTE Confidence: 0.926282286643982

00:00:47.560 --> 00:00:49.426 share the screen and it will.

NOTE Confidence: 0.926282286643982

00:00:49.430 --> 00:00:52.150 All will go well. Um?

NOTE Confidence: 0.800285160541534

00:00:54.660 --> 00:00:55.580 All right?

NOTE Confidence: 0.163235664367676

00:00:57.540 --> 00:01:02.040 Uh. So can you see the slides? Yes,

NOTE Confidence: 0.908503115177155

00:01:02.040 --> 00:01:03.640 OK, great. OK, well everyone,

NOTE Confidence: 0.908503115177155

00:01:03.640 --> 00:01:06.214 I'm very happy to be here even though it's

NOTE Confidence: 0.908503115177155

00:01:06.214 --> 00:01:08.963 by zoom an be able to participate in my

NOTE Confidence: 0.908503115177155

00:01:08.963 --> 00:01:11.350 first Yale Cancer Center Grand rounds.

NOTE Confidence: 0.908503115177155

00:01:11.350 --> 00:01:12.845 This actually is not going

NOTE Confidence: 0.908503115177155

00:01:12.845 --> 00:01:14.880 to be a talk about cancer.

NOTE Confidence: 0.908503115177155

00:01:14.880 --> 00:01:17.448 It's going to be a talk about COVID-19,

NOTE Confidence: 0.908503115177155

00:01:17.450 --> 00:01:20.369 which is also a topic on everyone's.

NOTE Confidence: 0.908503115177155

00:01:20.370 --> 00:01:21.930 Uh, mind these days,

NOTE Confidence: 0.908503115177155

00:01:21.930 --> 00:01:24.716 so I'll tell you about some of

NOTE Confidence: 0.908503115177155

00:01:24.716 --> 00:01:27.208 the work our lab has been doing.

NOTE Confidence: 0.908503115177155

00:01:27.210 --> 00:01:29.345 Looking at host response based

NOTE Confidence: 0.908503115177155

00:01:29.345 --> 00:01:31.480 detection of respiratory virus an

NOTE Confidence: 0.908503115177155

00:01:31.552 --> 00:01:34.088 specifically applications to COVID-19.

NOTE Confidence: 0.908503115177155

00:01:34.090 --> 00:01:35.500 OK, so uh,

NOTE Confidence: 0.908503115177155

00:01:35.500 --> 00:01:38.790 this is just a disclosure that I'm

NOTE Confidence: 0.908503115177155

00:01:38.900 --> 00:01:43.499 going to inventor on to patent applications.

NOTE Confidence: 0.908503115177155

00:01:43.500 --> 00:01:46.076 So today I'll be talking about why are

NOTE Confidence: 0.908503115177155

00:01:46.076 --> 00:01:49.028 we interested in studying the early host

NOTE Confidence: 0.908503115177155

00:01:49.028 --> 00:01:50.820 responses against respiratory viruses,

NOTE Confidence: 0.908503115177155

00:01:50.820 --> 00:01:53.130 or in this case in particular.

NOTE Confidence: 0.908503115177155

00:01:53.130 --> 00:01:54.282 SARS coronavirus two,

NOTE Confidence: 0.908503115177155

00:01:54.282 --> 00:01:56.586 the virus that causes cobra 19.

NOTE Confidence: 0.908503115177155

00:01:56.590 --> 00:01:58.385 I'll give a brief overview

NOTE Confidence: 0.908503115177155

00:01:58.385 --> 00:02:00.672 on the basics of Cobra 19

NOTE Confidence: 0.908503115177155

00:02:00.672 --> 00:02:02.747 diagnostics an I'll talk about,

NOTE Confidence: 0.908503115177155

00:02:02.750 --> 00:02:05.053 then a project that we've been doing

NOTE Confidence: 0.908503115177155

00:02:05.053 --> 00:02:07.349 since March on screening using host

NOTE Confidence: 0.908503115177155

00:02:07.349 --> 00:02:09.827 biomarkers for this disease and then

NOTE Confidence: 0.908503115177155

00:02:09.827 --> 00:02:11.990 future directions of the project.

NOTE Confidence: 0.902029097080231

00:02:14.060 --> 00:02:16.188 So as I was preparing this talk,

NOTE Confidence: 0.902029097080231

00:02:16.190 --> 00:02:18.710 I looked back at some of my previous

NOTE Confidence: 0.902029097080231

00:02:18.710 --> 00:02:21.219 talks and this is actually an intro slide

NOTE Confidence: 0.902029097080231

00:02:21.219 --> 00:02:24.466 I had from a talk I gave at the end of

NOTE Confidence: 0.902029097080231

00:02:24.466 --> 00:02:26.222 November to the virology faculty group,

NOTE Confidence: 0.902029097080231

00:02:26.222 --> 00:02:28.350 and I thought it was kind of.

NOTE Confidence: 0.902029097080231

00:02:28.350 --> 00:02:30.345 It looks so different in the lens

NOTE Confidence: 0.902029097080231

00:02:30.345 --> 00:02:31.901 of our current environment that

NOTE Confidence: 0.902029097080231

00:02:31.901 --> 00:02:33.815 I thought I would show it.

NOTE Confidence: 0.902029097080231

00:02:33.820 --> 00:02:35.845 So I I used to start my talk by

NOTE Confidence: 0.902029097080231

00:02:35.845 --> 00:02:37.706 convincing everyone of the importance

NOTE Confidence: 0.902029097080231

00:02:37.706 --> 00:02:39.286 of respiratory virus infections,

NOTE Confidence: 0.902029097080231

00:02:39.290 --> 00:02:41.418 which is a much easier sell now,

NOTE Confidence: 0.902029097080231

00:02:41.420 --> 00:02:42.026 but actually,

NOTE Confidence: 0.902029097080231

00:02:42.026 --> 00:02:43.238 even before this pandemic,

NOTE Confidence: 0.902029097080231

00:02:43.240 --> 00:02:44.302 these infections cause.

NOTE Confidence: 0.902029097080231

00:02:44.302 --> 00:02:45.718 Over 500 million infections

NOTE Confidence: 0.902029097080231

00:02:45.718 --> 00:02:47.229 per year in the US,

NOTE Confidence: 0.902029097080231

00:02:47.230 --> 00:02:49.750 so that's more than one per person and

NOTE Confidence: 0.902029097080231

00:02:49.750 --> 00:02:52.429 granted a lot of those are common colds,

NOTE Confidence: 0.902029097080231

00:02:52.430 --> 00:02:54.050 but some of those are

NOTE Confidence: 0.902029097080231

00:02:54.050 --> 00:02:55.346 serious illnesses such as.

NOTE Confidence: 0.902029097080231

00:02:55.350 --> 00:02:57.074 Influenza with hospitalization or

NOTE Confidence: 0.902029097080231

00:02:57.074 --> 00:02:59.229 hospitalization for asthma attack or

NOTE Confidence: 0.902029097080231

00:02:59.229 --> 00:03:01.414 CEO PD Exacerbation which are very

NOTE Confidence: 0.902029097080231

00:03:01.414 --> 00:03:03.525 often caused by viruses and also

NOTE Confidence: 0.902029097080231

00:03:03.525 --> 00:03:05.691 there has been this emerging this

NOTE Confidence: 0.902029097080231

00:03:05.691 --> 00:03:07.162 lingering concern about emerging

NOTE Confidence: 0.902029097080231

00:03:07.162 --> 00:03:08.690 infections with good reason.

NOTE Confidence: 0.902029097080231

00:03:08.690 --> 00:03:11.042 As we know now and I usually put

NOTE Confidence: 0.902029097080231

00:03:11.042 --> 00:03:13.332 up this photo to describe that

NOTE Confidence: 0.902029097080231

00:03:13.332 --> 00:03:15.357 that's actually a picture of

NOTE Confidence: 0.902029097080231

00:03:15.357 --> 00:03:17.828 the SARS coronavirus from 2003.

NOTE Confidence: 0.902029097080231

00:03:17.830 --> 00:03:20.679 But now when we see these pictures

NOTE Confidence: 0.902029097080231

00:03:20.679 --> 00:03:22.653 it definitely conjures up something

NOTE Confidence: 0.902029097080231

00:03:22.653 --> 00:03:24.687 else in all of our minds,

NOTE Confidence: 0.902029097080231

00:03:24.690 --> 00:03:28.137 which is the 2nd SARS Coronavirus SARS Co V2.

NOTE Confidence: 0.902029097080231

00:03:28.140 --> 00:03:30.216 Uh, which causes the disease cobra,

NOTE Confidence: 0.902029097080231

00:03:30.220 --> 00:03:32.708 19 and I just checked on the Johns

NOTE Confidence: 0.902029097080231

00:03:32.708 --> 00:03:34.640 Hopkins Portal an at the moment

NOTE Confidence: 0.902029097080231

00:03:34.640 --> 00:03:36.506 there's over 7 million cases and

NOTE Confidence: 0.902029097080231

00:03:36.573 --> 00:03:38.253 over 400,000 deaths described

NOTE Confidence: 0.902029097080231

00:03:38.253 --> 00:03:39.933 globally from Cobra 19,

NOTE Confidence: 0.902029097080231

00:03:39.940 --> 00:03:42.708 so this is definitely having a high impact.

NOTE Confidence: 0.902029097080231

00:03:42.710 --> 00:03:44.395 It's impacting our seminar that

NOTE Confidence: 0.902029097080231

00:03:44.395 --> 00:03:46.530 were having if I zoom today,

NOTE Confidence: 0.902029097080231

00:03:46.530 --> 00:03:47.966 it's impacting our work.

NOTE Confidence: 0.902029097080231

00:03:47.966 --> 00:03:50.120 It's impacting our economy and of

NOTE Confidence: 0.902029097080231

00:03:50.183 --> 00:03:52.223 course our health and there's still

NOTE Confidence: 0.902029097080231

00:03:52.223 --> 00:03:53.975 a lot of unanswered challenges

NOTE Confidence: 0.902029097080231

00:03:53.975 --> 00:03:56.250 were right in the middle of it.

NOTE Confidence: 0.902029097080231

00:03:56.250 --> 00:03:59.382 Trying to figure out how to deal with it.

NOTE Confidence: 0.902029097080231

00:03:59.390 --> 00:04:01.973 Um, and even when this acute phase is over,

NOTE Confidence: 0.902029097080231

00:04:01.980 --> 00:04:03.420 there will be long-term impacts,

NOTE Confidence: 0.902029097080231

00:04:03.420 --> 00:04:05.478 both on the health of the respiratory

NOTE Confidence: 0.902029097080231

00:04:05.478 --> 00:04:08.039 system in the patients who are recovering.

NOTE Confidence: 0.902029097080231

00:04:08.040 --> 00:04:09.828 Or have recovered and we also

NOTE Confidence: 0.902029097080231

00:04:09.828 --> 00:04:11.980 have to think what lessons can we

NOTE Confidence: 0.902029097080231

00:04:11.980 --> 00:04:14.066 learn from this that are going to

NOTE Confidence: 0.902029097080231

00:04:14.133 --> 00:04:16.059 help us with the next pandemic.

NOTE Confidence: 0.902029097080231

00:04:16.060 --> 00:04:18.886 So this is sort of a just a screenshot

NOTE Confidence: 0.902029097080231

00:04:18.886 --> 00:04:21.585 of my labs homepage to remind me to

NOTE Confidence: 0.902029097080231

00:04:21.585 --> 00:04:24.038 tell you a little bit about what

NOTE Confidence: 0.902029097080231

00:04:24.038 --> 00:04:26.438 we do a little bit more broadly,

NOTE Confidence: 0.902029097080231

00:04:26.438 --> 00:04:28.406 we really focus on the lining

NOTE Confidence: 0.902029097080231

00:04:28.406 --> 00:04:29.800 of the respiratory tract,

NOTE Confidence: 0.902029097080231

00:04:29.800 --> 00:04:32.806 the airway mucosa as you see in this picture.

NOTE Confidence: 0.902029097080231

00:04:32.810 --> 00:04:34.754 This is actually what the epithelial

NOTE Confidence: 0.902029097080231

00:04:34.754 --> 00:04:37.168 layer in the upper airway looks like,

NOTE Confidence: 0.902029097080231

00:04:37.170 --> 00:04:38.840 and these are these cells.

NOTE Confidence: 0.902029097080231

00:04:38.840 --> 00:04:40.700 The epithelial cells are the target

NOTE Confidence: 0.902029097080231

00:04:40.700 --> 00:04:42.720 cells of viral infection and viruses

NOTE Confidence: 0.902029097080231

00:04:42.720 --> 00:04:44.530 replicate all the various respiratory

NOTE Confidence: 0.902029097080231

00:04:44.530 --> 00:04:46.289 viruses replicate in these cells.

NOTE Confidence: 0.902029097080231

00:04:46.290 --> 00:04:48.733 And these cells also are the first

NOTE Confidence: 0.902029097080231

00:04:48.733 --> 00:04:50.664 line of defense that recognizes

NOTE Confidence: 0.902029097080231

00:04:50.664 --> 00:04:53.094 the infection and sends out signals

NOTE Confidence: 0.902029097080231

00:04:53.094 --> 00:04:55.651 to the immune system to come to

NOTE Confidence: 0.902029097080231

00:04:55.651 --> 00:04:57.980 the area and also sends out turns

NOTE Confidence: 0.902029097080231

00:04:57.980 --> 00:04:59.930 on affecter mechanisms to try to

NOTE Confidence: 0.902029097080231

00:04:59.930 --> 00:05:02.108 stop the virus from replicating.

NOTE Confidence: 0.902029097080231

00:05:02.110 --> 00:05:03.582 So there are very.

NOTE Confidence: 0.902029097080231

00:05:03.582 --> 00:05:05.790 It's a very highly active tissue.

NOTE Confidence: 0.90692675113678

00:05:05.790 --> 00:05:06.861 The airway mucosa.

NOTE Confidence: 0.90692675113678

00:05:06.861 --> 00:05:09.003 Our lab is focused on these

NOTE Confidence: 0.90692675113678

00:05:09.003 --> 00:05:10.948 early steps of host defense,

NOTE Confidence: 0.90692675113678

00:05:10.950 --> 00:05:13.146 and we're also interested in repair.

NOTE Confidence: 0.90692675113678

00:05:13.150 --> 00:05:14.490 Actually, because after the.

NOTE Confidence: 0.90692675113678

00:05:14.490 --> 00:05:16.500 Their way isn't like the skin.

NOTE Confidence: 0.90692675113678

00:05:16.500 --> 00:05:17.700 It doesn't constantly regenerate,

NOTE Confidence: 0.90692675113678

00:05:17.700 --> 00:05:19.200 but rather only when damage

NOTE Confidence: 0.90692675113678

00:05:19.200 --> 00:05:20.410 does it then regenerate,

NOTE Confidence: 0.90692675113678

00:05:20.410 --> 00:05:22.384 but it has the potential for these

NOTE Confidence: 0.90692675113678

00:05:22.384 --> 00:05:24.310 stem cells that you see here at

NOTE Confidence: 0.90692675113678

00:05:24.310 --> 00:05:25.834 the base of the epithelium to

NOTE Confidence: 0.90692675113678

00:05:25.895 --> 00:05:27.930 proliferate and recreate that issue.

NOTE Confidence: 0.90692675113678

00:05:27.930 --> 00:05:29.508 And one thing we're interested in

NOTE Confidence: 0.90692675113678

00:05:29.508 --> 00:05:31.314 is how come that sometimes goes

NOTE Confidence: 0.90692675113678

00:05:31.314 --> 00:05:33.044 right and sometimes goes wrong,

NOTE Confidence: 0.90692675113678

00:05:33.050 --> 00:05:34.898 and sometimes when it goes wrong

NOTE Confidence: 0.90692675113678

00:05:34.898 --> 00:05:37.000 that leads to cancer and that I

NOTE Confidence: 0.90692675113678

00:05:37.000 --> 00:05:38.876 hopefully I'll be able to come back

NOTE Confidence: 0.90692675113678

00:05:38.934 --> 00:05:40.818 for a different grounds and talk

NOTE Confidence: 0.90692675113678

00:05:40.818 --> 00:05:42.608 about that project at some point.

NOTE Confidence: 0.90692675113678

00:05:42.608 --> 00:05:44.456 But for today I'm going to focus

NOTE Confidence: 0.90692675113678

00:05:44.456 --> 00:05:46.349 on the upper respiratory tract.

NOTE Confidence: 0.90692675113678

00:05:46.350 --> 00:05:48.170 As the gatekeeper against infection,

NOTE Confidence: 0.90692675113678

00:05:48.170 --> 00:05:50.276 so most of the pathogens that

NOTE Confidence: 0.90692675113678

00:05:50.276 --> 00:05:52.487 come into our airway come in

NOTE Confidence: 0.90692675113678

00:05:52.487 --> 00:05:54.695 through the nose and mouth throat,

NOTE Confidence: 0.90692675113678

00:05:54.700 --> 00:05:56.878 and this includes viruses and bacteria.

NOTE Confidence: 0.90692675113678

00:05:56.880 --> 00:05:58.698 And often if that infection can

NOTE Confidence: 0.90692675113678

00:05:58.698 --> 00:06:01.422 be nipped in the Bud in the upper

NOTE Confidence: 0.90692675113678

00:06:01.422 --> 00:06:02.862 respiratory tract that protects

NOTE Confidence: 0.90692675113678

00:06:02.862 --> 00:06:04.888 the rest of the respiratory

NOTE Confidence: 0.90692675113678

00:06:04.888 --> 00:06:06.943 system from that that infectious

NOTE Confidence: 0.90692675113678

00:06:06.943 --> 00:06:09.066 agent getting down to the lungs.

NOTE Confidence: 0.90692675113678

00:06:09.066 --> 00:06:11.010 So when these offense defenses are

NOTE Confidence: 0.90692675113678

00:06:11.073 --> 00:06:13.575 effective in the upper respiratory tract,

NOTE Confidence: 0.90692675113678

00:06:13.580 --> 00:06:15.692 it can really be the difference

NOTE Confidence: 0.90692675113678

00:06:15.692 --> 00:06:17.620 between miles or asymptomatic illness.

NOTE Confidence: 0.90692675113678

00:06:17.620 --> 00:06:18.944 Versus a serious illness.

NOTE Confidence: 0.90692675113678

00:06:18.944 --> 00:06:20.930 And we know that that's happening

NOTE Confidence: 0.90692675113678

00:06:20.990 --> 00:06:22.980 all the time, not just with SARS,

NOTE Confidence: 0.90692675113678

00:06:22.980 --> 00:06:23.610 Co V2,

NOTE Confidence: 0.90692675113678

00:06:23.610 --> 00:06:25.662 but other viruses that often there

NOTE Confidence: 0.90692675113678

00:06:25.662 --> 00:06:27.368 cleared from the become their

NOTE Confidence: 0.90692675113678

00:06:27.368 --> 00:06:29.279 detectable in a way for a time.

NOTE Confidence: 0.90692675113678

00:06:29.280 --> 00:06:30.144 A short time.

NOTE Confidence: 0.90692675113678

00:06:30.144 --> 00:06:32.160 They and they are cleared without the

NOTE Confidence: 0.90692675113678

00:06:32.225 --> 00:06:34.319 patient knowing that they were there.

NOTE Confidence: 0.90692675113678

00:06:34.320 --> 00:06:35.262 That can happen,

NOTE Confidence: 0.90692675113678

00:06:35.262 --> 00:06:37.146 or you can have the opposite,

NOTE Confidence: 0.90692675113678

00:06:37.150 --> 00:06:39.388 where the patients in the ICU.

NOTE Confidence: 0.90692675113678

00:06:39.390 --> 00:06:40.800 So we're interested in factors

NOTE Confidence: 0.90692675113678

00:06:40.800 --> 00:06:41.928 that modulate those defenses,

NOTE Confidence: 0.90692675113678

00:06:41.930 --> 00:06:43.802 and we like to think of it as like

NOTE Confidence: 0.90692675113678

00:06:43.802 --> 00:06:45.538 a marble sitting on a mountain

NOTE Confidence: 0.90692675113678

00:06:45.538 --> 00:06:47.454 where this is the very beginning

NOTE Confidence: 0.90692675113678

00:06:47.454 --> 00:06:48.978 of the immune response.

NOTE Confidence: 0.90692675113678

00:06:48.980 --> 00:06:50.425 That's going to recruit certain

NOTE Confidence: 0.90692675113678

00:06:50.425 --> 00:06:51.870 activate certain immune cells in

NOTE Confidence: 0.90692675113678

00:06:51.922 --> 00:06:53.464 the respiratory system and sort of

NOTE Confidence: 0.90692675113678

00:06:53.464 --> 00:06:55.180 nudging that marble in One Direction.

NOTE Confidence: 0.90692675113678

00:06:55.180 --> 00:06:57.441 It will roll down the Hill one way,

NOTE Confidence: 0.90692675113678

00:06:57.441 --> 00:06:59.408 and you'll get one type of response,

NOTE Confidence: 0.90692675113678

00:06:59.410 --> 00:07:01.102 whereas if you nudge it in

NOTE Confidence: 0.90692675113678

00:07:01.102 --> 00:07:01.948 the other direction,

NOTE Confidence: 0.90692675113678

00:07:01.950 --> 00:07:03.917 it can have a very different outcome.

NOTE Confidence: 0.90692675113678

00:07:03.920 --> 00:07:06.482 So we're very interested in understanding

NOTE Confidence: 0.90692675113678

00:07:06.482 --> 00:07:08.590 the molecular basis of that.

NOTE Confidence: 0.90692675113678

00:07:08.590 --> 00:07:09.266 So, uhm,

NOTE Confidence: 0.90692675113678

00:07:09.266 --> 00:07:12.474 this is a another picture of this as an

NOTE Confidence: 0.90692675113678

00:07:12.474 --> 00:07:15.048 upper respiratory tract from a child,

NOTE Confidence: 0.90692675113678

00:07:15.050 --> 00:07:17.366 and so what's something that's kind

NOTE Confidence: 0.90692675113678

00:07:17.366 --> 00:07:19.338 of interesting about this anatomy

NOTE Confidence: 0.90692675113678

00:07:19.338 --> 00:07:21.504 is I actually just myself today.

NOTE Confidence: 0.90692675113678

00:07:21.510 --> 00:07:23.790 Had a swab for this surveillance

NOTE Confidence: 0.90692675113678

00:07:23.790 --> 00:07:24.930 for the stars,

NOTE Confidence: 0.90692675113678

00:07:24.930 --> 00:07:27.618 Kobe 2 and we all notice swab goes

NOTE Confidence: 0.90692675113678

00:07:27.618 --> 00:07:30.248 right in here in the nasopharynx,

NOTE Confidence: 0.90692675113678

00:07:30.250 --> 00:07:33.314 and that swab also collect some of the

NOTE Confidence: 0.90692675113678

00:07:33.314 --> 00:07:36.116 patients own cells and some of the

NOTE Confidence: 0.90692675113678

00:07:36.116 --> 00:07:38.900 proteins made by the patient's own cells.

NOTE Confidence: 0.90692675113678

00:07:38.900 --> 00:07:41.273 And in a study with Marie Landry

NOTE Confidence: 0.90692675113678

00:07:41.273 --> 00:07:43.481 of the director of the clinical

NOTE Confidence: 0.90692675113678

00:07:43.481 --> 00:07:45.336 virology lab back in 2018,

NOTE Confidence: 0.90692675113678

00:07:45.340 --> 00:07:47.434 we showed that you can actually

NOTE Confidence: 0.90692675113678

00:07:47.434 --> 00:07:49.648 detect the patterns of jeans and

NOTE Confidence: 0.90692675113678

00:07:49.648 --> 00:07:51.898 proteins being made in the respiratory

NOTE Confidence: 0.90692675113678

00:07:51.898 --> 00:07:54.060 tract and the huge changes that

NOTE Confidence: 0.90692675113678

00:07:54.060 --> 00:07:56.076 occur in the rapid response to

NOTE Confidence: 0.92956819859418

00:07:56.080 --> 00:07:58.426 viral infection. And if you think

NOTE Confidence: 0.92956819859418

00:07:58.426 --> 00:08:00.400 about the progression of SARS,

NOTE Confidence: 0.92956819859418

00:08:00.400 --> 00:08:02.528 Co V2, there's you probably have all

NOTE Confidence: 0.92956819859418

00:08:02.528 --> 00:08:04.728 seen a figure something like this.

NOTE Confidence: 0.92956819859418

00:08:04.730 --> 00:08:07.386 And of course this will be refined overtime,

NOTE Confidence: 0.92956819859418

00:08:07.390 --> 00:08:09.422 but the basic idea seems to be that

NOTE Confidence: 0.92956819859418

00:08:09.422 --> 00:08:11.593 at this early stage of infection

NOTE Confidence: 0.92956819859418

00:08:11.593 --> 00:08:13.598 we have upper respiratory tract

NOTE Confidence: 0.92956819859418

00:08:13.598 --> 00:08:15.716 replication and those kinds of symptoms.

NOTE Confidence: 0.92956819859418

00:08:15.720 --> 00:08:17.582 Then it moves to the long and

NOTE Confidence: 0.92956819859418

00:08:17.582 --> 00:08:19.306 then in severe cases there's

NOTE Confidence: 0.92956819859418

00:08:19.306 --> 00:08:21.038 a host inflammatory response.

NOTE Confidence: 0.92956819859418

00:08:21.040 --> 00:08:23.728 It causes a lot of damage.

NOTE Confidence: 0.92956819859418

00:08:23.730 --> 00:08:24.970 Um so.

NOTE Confidence: 0.92956819859418

00:08:24.970 --> 00:08:27.450 At this early stage,

NOTE Confidence: 0.92956819859418

00:08:27.450 --> 00:08:29.704 what we can find out using these

NOTE Confidence: 0.92956819859418

00:08:29.704 --> 00:08:32.223 respiratory swabs is what can we think

NOTE Confidence: 0.92956819859418

00:08:32.223 --> 00:08:34.078 about alternatives and additional things

NOTE Confidence: 0.92956819859418

00:08:34.078 --> 00:08:36.827 we can do for the best diagnosis an even,

NOTE Confidence: 0.92956819859418

00:08:36.830 --> 00:08:38.870 can we understand the difference

NOTE Confidence: 0.92956819859418

00:08:38.870 --> 00:08:41.333 is an inflammatory response is the

NOTE Confidence: 0.92956819859418

00:08:41.333 --> 00:08:43.433 very beginning that dictate the way

NOTE Confidence: 0.92956819859418

00:08:43.433 --> 00:08:45.719 the illness is going to progress?

NOTE Confidence: 0.92956819859418

00:08:45.720 --> 00:08:47.048 So today I'm not.

NOTE Confidence: 0.92956819859418

00:08:47.048 --> 00:08:49.320 I'm not gonna talk about bullet .2,

NOTE Confidence: 0.92956819859418

00:08:49.320 --> 00:08:51.609 I'm gonna talk about bullet .1 today.

NOTE Confidence: 0.92956819859418

00:08:51.610 --> 00:08:53.728 The diagnosis end.

NOTE Confidence: 0.92956819859418

00:08:53.730 --> 00:08:56.338 So I'll just start with giving a brief

NOTE Confidence: 0.92956819859418

00:08:56.338 --> 00:08:58.948 overview on diagnostics for a SARS Co V2.

NOTE Confidence: 0.92956819859418

00:08:58.950 --> 00:09:01.127 I know we have a diverse audience

NOTE Confidence: 0.92956819859418

00:09:01.127 --> 00:09:03.507 here an I gave a full length,

NOTE Confidence: 0.92956819859418

00:09:03.510 --> 00:09:03.785 uh,

NOTE Confidence: 0.92956819859418

00:09:03.785 --> 00:09:05.985 detailed description of this stuff for one of

NOTE Confidence: 0.92956819859418

00:09:05.985 --> 00:09:08.399 the Deans workshops that's available online.

NOTE Confidence: 0.92956819859418

00:09:08.400 --> 00:09:10.675 That this is everything in a nutshell,

NOTE Confidence: 0.92956819859418

00:09:10.680 --> 00:09:12.731 so I'm going to describe the test

NOTE Confidence: 0.92956819859418

00:09:12.731 --> 00:09:15.247 that we are currently doing at Yale.

NOTE Confidence: 0.92956819859418

00:09:15.250 --> 00:09:16.880 New Haven for this virus.

NOTE Confidence: 0.92956819859418

00:09:16.880 --> 00:09:18.830 The first Test answers a question.

NOTE Confidence: 0.92956819859418

00:09:18.830 --> 00:09:20.460 Does the patient have the

NOTE Confidence: 0.92956819859418

00:09:20.460 --> 00:09:21.438 infection right now?

NOTE Confidence: 0.92956819859418

00:09:21.440 --> 00:09:23.806 And basically what you do for that?

NOTE Confidence: 0.92956819859418

00:09:23.810 --> 00:09:27.194 Is you do the swab isolate are an RNA.

NOTE Confidence: 0.92956819859418

00:09:27.200 --> 00:09:29.090 Do RT PCR and ask?

NOTE Confidence: 0.92956819859418

00:09:29.090 --> 00:09:31.370 Can you detect viral jeans from

NOTE Confidence: 0.92956819859418

00:09:31.370 --> 00:09:33.696 the viral genome in this patient

NOTE Confidence: 0.92956819859418

00:09:33.696 --> 00:09:36.244 sample an if the answer is yes,

NOTE Confidence: 0.92956819859418

00:09:36.250 --> 00:09:38.842 it means a patient has the virus or

NOTE Confidence: 0.92956819859418

00:09:38.842 --> 00:09:41.088 the viral RNA and their nasopharynx

NOTE Confidence: 0.92956819859418

00:09:41.088 --> 00:09:43.864 right now and and that test is

NOTE Confidence: 0.92956819859418

00:09:43.864 --> 00:09:45.914 very specific because we're just

NOTE Confidence: 0.92956819859418

00:09:45.914 --> 00:09:48.330 looking at the genome of this

NOTE Confidence: 0.92956819859418

00:09:48.330 --> 00:09:50.255 virus and very specific regions.

NOTE Confidence: 0.92956819859418

00:09:50.260 --> 00:09:52.200 Sensitivity depends on when your

NOTE Confidence: 0.92956819859418

00:09:52.200 --> 00:09:53.752 sampling and sample collection

NOTE Confidence: 0.92956819859418

00:09:53.752 --> 00:09:55.528 and a few things like that,

NOTE Confidence: 0.92956819859418

00:09:55.530 --> 00:09:58.320 but it's a highly specific test.

NOTE Confidence: 0.92956819859418

00:09:58.320 --> 00:09:59.322 The other question,

NOTE Confidence: 0.92956819859418

00:09:59.322 --> 00:09:59.990 of course,

NOTE Confidence: 0.92956819859418

00:09:59.990 --> 00:10:02.314 is did the patient had the infection?

NOTE Confidence: 0.92956819859418

00:10:02.320 --> 00:10:04.312 Is there evidence of past infection

NOTE Confidence: 0.92956819859418

00:10:04.312 --> 00:10:05.308 and that's serology?

NOTE Confidence: 0.92956819859418

00:10:05.310 --> 00:10:07.522 So that's asking has the patient formed

NOTE Confidence: 0.92956819859418

00:10:07.522 --> 00:10:09.220 antibodies against the virus because

NOTE Confidence: 0.92956819859418

00:10:09.220 --> 00:10:10.965 they've already had the infection?

NOTE Confidence: 0.92956819859418

00:10:10.970 --> 00:10:12.888 Usually for a minimum of two weeks

NOTE Confidence: 0.92956819859418

00:10:12.888 --> 00:10:15.299 to have an adaptive immune response.

NOTE Confidence: 0.92956819859418

00:10:15.300 --> 00:10:17.852 And kudos to our clinical lab for having

NOTE Confidence: 0.92956819859418

00:10:17.852 --> 00:10:20.957 both of these up and running for awhile now.

NOTE Confidence: 0.92956819859418

00:10:20.960 --> 00:10:22.958 Marie Landry in the virology lab,

NOTE Confidence: 0.92956819859418

00:10:22.960 --> 00:10:24.312 and, uh, Rick Tourism.

NOTE Confidence: 0.92956819859418

00:10:24.312 --> 00:10:25.664 The clinical immunology lab

NOTE Confidence: 0.92956819859418

00:10:25.664 --> 00:10:27.689 have set these up and they're

NOTE Confidence: 0.92956819859418

00:10:27.689 --> 00:10:29.615 available to order on the patients,

NOTE Confidence: 0.92956819859418

00:10:29.620 --> 00:10:33.350 and this is this is our go to test to know.

NOTE Confidence: 0.92956819859418

00:10:33.350 --> 00:10:35.555 The server balance you know

NOTE Confidence: 0.92956819859418

00:10:35.555 --> 00:10:37.760 someone is infected right now.

NOTE Confidence: 0.92956819859418

00:10:37.760 --> 00:10:39.500 But there are still challenges.

NOTE Confidence: 0.92956819859418

00:10:39.500 --> 00:10:41.922 Are there still a lot of challenges

NOTE Confidence: 0.92956819859418

00:10:41.922 --> 00:10:43.679 that we're facing right now?

NOTE Confidence: 0.92956819859418

00:10:43.680 --> 00:10:46.109 One is how to expand testing capacity,

NOTE Confidence: 0.92956819859418

00:10:46.110 --> 00:10:47.498 and there's many different

NOTE Confidence: 0.92956819859418

00:10:47.498 --> 00:10:49.233 avenues this can go down.

NOTE Confidence: 0.92956819859418

00:10:49.240 --> 00:10:52.021 There is a group with Nate groove on an

NOTE Confidence: 0.92956819859418

00:10:52.021 --> 00:10:54.459 Wiley doing great stuff with saliva.

NOTE Confidence: 0.912440240383148

00:10:54.460 --> 00:10:55.712 Testing is one way,

NOTE Confidence: 0.912440240383148

00:10:55.712 --> 00:10:57.590 but there are there other ways

NOTE Confidence: 0.912440240383148

00:10:57.656 --> 00:10:59.798 we can be screening or expanding

NOTE Confidence: 0.912440240383148

00:10:59.798 --> 00:11:02.025 testing capacity to help make sure

NOTE Confidence: 0.912440240383148

00:11:02.025 --> 00:11:03.860 we're not spreading this virus.

NOTE Confidence: 0.912440240383148

00:11:03.860 --> 00:11:07.166 Further, as we restart the economy.

NOTE Confidence: 0.912440240383148

00:11:07.170 --> 00:11:09.144 Another challenge is that some people

NOTE Confidence: 0.912440240383148

00:11:09.144 --> 00:11:11.475 who test positive by the PCR tests

NOTE Confidence: 0.912440240383148

00:11:11.475 --> 00:11:13.383 don't actually seem to be infectious

NOTE Confidence: 0.912440240383148

00:11:13.383 --> 00:11:15.466 based on a study from South Korea and

NOTE Confidence: 0.912440240383148

00:11:15.466 --> 00:11:17.283 a few other observations elsewhere of

NOTE Confidence: 0.912440240383148

00:11:17.283 --> 00:11:19.449 people who recovered and still test

NOTE Confidence: 0.912440240383148

00:11:19.449 --> 00:11:21.444 positive for a long time but don't seem

NOTE Confidence: 0.912440240383148

00:11:21.444 --> 00:11:23.418 to spread the virus to their Contacts.

NOTE Confidence: 0.912440240383148

00:11:23.420 --> 00:11:25.732 So how can we tell the difference there

NOTE Confidence: 0.912440240383148

00:11:25.732 --> 00:11:27.550 and then finally also very important

NOTE Confidence: 0.912440240383148

00:11:27.550 --> 00:11:29.994 is how do we find new viruses that

NOTE Confidence: 0.912440240383148

00:11:29.994 --> 00:11:32.143 are going to be the next pandemic

NOTE Confidence: 0.912440240383148

00:11:32.143 --> 00:11:34.245 that are going around and causing

NOTE Confidence: 0.912440240383148

00:11:34.245 --> 00:11:36.759 Ellis in our patient under our radar?

NOTE Confidence: 0.912440240383148

00:11:36.760 --> 00:11:38.610 And so this is one.

NOTE Confidence: 0.912440240383148

00:11:38.610 --> 00:11:41.498 These kind of questions are why we got

NOTE Confidence: 0.912440240383148

00:11:41.498 --> 00:11:43.788 into looking at the host response.

NOTE Confidence: 0.912440240383148

00:11:43.790 --> 00:11:45.640 In addition to understanding pathogenesis.

NOTE Confidence: 0.912440240383148

00:11:45.640 --> 00:11:48.230 But sort of on the practical side

NOTE Confidence: 0.912440240383148

00:11:48.230 --> 00:11:51.590 of how can it help us an once is

NOTE Confidence: 0.912440240383148

00:11:51.590 --> 00:11:53.034 to die for diagnosis.

NOTE Confidence: 0.912440240383148

00:11:53.040 --> 00:11:54.890 We're all familiar with them.

NOTE Confidence: 0.912440240383148

00:11:54.890 --> 00:11:58.220 I mean the basic one for infection is fever.

NOTE Confidence: 0.912440240383148

00:11:58.220 --> 00:12:00.070 Fever is a host response

NOTE Confidence: 0.912440240383148

00:12:00.070 --> 00:12:01.550 to infection and fever.

NOTE Confidence: 0.912440240383148

00:12:01.550 --> 00:12:02.660 Is fever elevated?

NOTE Confidence: 0.912440240383148

00:12:02.660 --> 00:12:03.400 Leukocyte count?

NOTE Confidence: 0.912440240383148

00:12:03.400 --> 00:12:05.644 Those are signs that the patient

NOTE Confidence: 0.912440240383148

00:12:05.644 --> 00:12:06.766 has an infection.

NOTE Confidence: 0.912440240383148

00:12:06.770 --> 00:12:08.226 They're not terribly specific,

NOTE Confidence: 0.912440240383148

00:12:08.226 --> 00:12:10.410 but they are a host response

NOTE Confidence: 0.912440240383148

00:12:10.478 --> 00:12:12.274 has been used for, you know,

NOTE Confidence: 0.912440240383148

00:12:12.274 --> 00:12:13.984 long time, hundreds of years,

NOTE Confidence: 0.912440240383148

00:12:13.990 --> 00:12:15.182 even the the fever.

NOTE Confidence: 0.912440240383148

00:12:15.182 --> 00:12:17.434 But now we can get more granular

NOTE Confidence: 0.912440240383148

00:12:17.434 --> 00:12:19.762 about it that we have much

NOTE Confidence: 0.912440240383148

00:12:19.762 --> 00:12:21.560 better techniques to look at.

NOTE Confidence: 0.912440240383148

00:12:21.560 --> 00:12:22.844 Patterns of gene expression,

NOTE Confidence: 0.912440240383148

00:12:22.844 --> 00:12:24.770 patterns of protein expression using Multi

NOTE Confidence: 0.912440240383148

00:12:24.819 --> 00:12:26.719 Plex Technologies like transcriptomics an.

NOTE Confidence: 0.912440240383148

00:12:26.720 --> 00:12:28.841 The idea is if a patient comes

NOTE Confidence: 0.912440240383148

00:12:28.841 --> 00:12:30.510 in and is coughing,

NOTE Confidence: 0.912440240383148

00:12:30.510 --> 00:12:32.568 you don't know what's causing that,

NOTE Confidence: 0.912440240383148

00:12:32.570 --> 00:12:35.234 but if the if that's being caused by a

NOTE Confidence: 0.912440240383148

00:12:35.234 --> 00:12:37.078 respiratory virus that's replicating.

NOTE Confidence: 0.912440240383148

00:12:37.080 --> 00:12:37.694 That's activated,

NOTE Confidence: 0.912440240383148

00:12:37.694 --> 00:12:38.922 the immune system turned

NOTE Confidence: 0.912440240383148

00:12:38.922 --> 00:12:40.150 on antiviral defense is,

NOTE Confidence: 0.912440240383148

00:12:40.150 --> 00:12:41.605 which are different then defenses

NOTE Confidence: 0.912440240383148

00:12:41.605 --> 00:12:43.755 against an irritant or a bacteria or

NOTE Confidence: 0.912440240383148

00:12:43.755 --> 00:12:45.365 other things that cause coughing.

NOTE Confidence: 0.912440240383148

00:12:45.370 --> 00:12:47.836 And if you look at the patterns of Gene

NOTE Confidence: 0.912440240383148

00:12:47.836 --> 00:12:50.276 and proteins that the body is making,

NOTE Confidence: 0.912440240383148

00:12:50.280 --> 00:12:53.392 you can sort of interrogate the bodies own

NOTE Confidence: 0.912440240383148

00:12:53.392 --> 00:12:55.977 diagnosis and and know what's going on.

NOTE Confidence: 0.912440240383148

00:12:55.980 --> 00:12:56.730 And so,

NOTE Confidence: 0.912440240383148

00:12:56.730 --> 00:12:57.480 uh, again,

NOTE Confidence: 0.912440240383148

00:12:57.480 --> 00:13:00.650 this is based on the study from 2018.

NOTE Confidence: 0.912440240383148

00:13:00.650 --> 00:13:02.590 A very simple question was,

NOTE Confidence: 0.912440240383148

00:13:02.590 --> 00:13:05.656 are there common patterns to all respiratory

NOTE Confidence: 0.912440240383148

00:13:05.656 --> 00:13:08.428 viruses that we can look at to say?

NOTE Confidence: 0.912440240383148

00:13:08.430 --> 00:13:10.932 Is this patient experiencing a respiratory

NOTE Confidence: 0.912440240383148

00:13:10.932 --> 00:13:13.100 virus infection right now or not?

NOTE Confidence: 0.912440240383148

00:13:13.100 --> 00:13:15.428 Because you may not know this,

NOTE Confidence: 0.912440240383148

00:13:15.430 --> 00:13:18.083 but in the winter seasons I'm not

NOTE Confidence: 0.912440240383148

00:13:18.083 --> 00:13:20.468 talking about this year but in

NOTE Confidence: 0.912440240383148

00:13:20.468 --> 00:13:22.423 in past years between December,

NOTE Confidence: 0.912440240383148

00:13:22.430 --> 00:13:24.600 March redo thousands of panels

NOTE Confidence: 0.912440240383148

00:13:24.600 --> 00:13:26.336 of symptomatic patients testing

NOTE Confidence: 0.912440240383148

00:13:26.336 --> 00:13:28.267 them for 15 viruses to see.

NOTE Confidence: 0.912440240383148

00:13:28.270 --> 00:13:28.636 Uh,

NOTE Confidence: 0.912440240383148

00:13:28.636 --> 00:13:30.832 which virus might be causing their

NOTE Confidence: 0.912440240383148

00:13:30.832 --> 00:13:32.949 respiratory symptoms and only about 1/3

NOTE Confidence: 0.912440240383148

00:13:32.949 --> 00:13:35.182 of them actually have a viral infection,

NOTE Confidence: 0.912440240383148

00:13:35.190 --> 00:13:37.647 so 2/3 of them may have some

NOTE Confidence: 0.912440240383148

00:13:37.647 --> 00:13:39.000 other process going on.

NOTE Confidence: 0.912440240383148

00:13:39.000 --> 00:13:41.254 So we asked whether we can look

NOTE Confidence: 0.912440240383148

00:13:41.254 --> 00:13:43.154 at Biomarkers of the antiviral

NOTE Confidence: 0.912440240383148

00:13:43.154 --> 00:13:45.304 response to identify who those

NOTE Confidence: 0.912440240383148

00:13:45.304 --> 00:13:47.469 patients with viral infection R.

NOTE Confidence: 0.912440240383148

00:13:47.470 --> 00:13:49.690 And this is to this is

NOTE Confidence: 0.912440240383148

00:13:49.690 --> 00:13:51.170 published something to sum

NOTE Confidence: 0.884373486042023

00:13:51.253 --> 00:13:52.689 it up very quickly,

NOTE Confidence: 0.884373486042023

00:13:52.690 --> 00:13:55.165 but the idea is that we found that jeans

NOTE Confidence: 0.884373486042023

00:13:55.165 --> 00:13:57.826 and proteins that are highly induced

NOTE Confidence: 0.884373486042023

00:13:57.826 --> 00:14:00.141 during the antiviral interferon response.

NOTE Confidence: 0.884373486042023

00:14:00.150 --> 00:14:02.754 If you detect those in the nasopharynx,

NOTE Confidence: 0.884373486042023

00:14:02.760 --> 00:14:05.119 it's a very good good indicator that

NOTE Confidence: 0.884373486042023

00:14:05.119 --> 00:14:07.239 there's a viral infection there,

NOTE Confidence: 0.884373486042023

00:14:07.240 --> 00:14:10.216 and this colored graph just shows kcil 10.

NOTE Confidence: 0.884373486042023

00:14:10.220 --> 00:14:12.458 This is actually one of these

NOTE Confidence: 0.884373486042023

00:14:12.458 --> 00:14:13.577 interference stimulated jeans.

NOTE Confidence: 0.884373486042023

00:14:13.580 --> 00:14:14.351 It's a cytokine.

NOTE Confidence: 0.884373486042023

00:14:14.351 --> 00:14:16.150 And it goes up many orders of

NOTE Confidence: 0.884373486042023

00:14:16.215 --> 00:14:17.865 magnitude during viral infection and

NOTE Confidence: 0.884373486042023

00:14:17.865 --> 00:14:19.898 the level of it highly correlated

NOTE Confidence: 0.884373486042023

00:14:19.898 --> 00:14:21.818 to the presence of the virus.

NOTE Confidence: 0.884373486042023

00:14:21.820 --> 00:14:24.770 So this is like the level on a log scale,

NOTE Confidence: 0.884373486042023

00:14:24.770 --> 00:14:26.570 and then these bars indicate

NOTE Confidence: 0.884373486042023

00:14:26.570 --> 00:14:28.370 that there's a virus present.

NOTE Confidence: 0.884373486042023

00:14:28.370 --> 00:14:30.603 And we did two different studies at

NOTE Confidence: 0.884373486042023

00:14:30.603 --> 00:14:32.948 two different times of year with two

NOTE Confidence: 0.884373486042023

00:14:32.948 --> 00:14:34.934 different viruses circulating an in both

NOTE Confidence: 0.884373486042023

00:14:34.995 --> 00:14:37.603 of those are represented on these pie charts,

NOTE Confidence: 0.884373486042023

00:14:37.610 --> 00:14:39.455 which viruses were amongst the

NOTE Confidence: 0.884373486042023

00:14:39.455 --> 00:14:41.300 virus positives and it's basically

NOTE Confidence: 0.884373486042023

00:14:41.357 --> 00:14:42.887 any virus that we test for.

NOTE Confidence: 0.884373486042023

00:14:42.890 --> 00:14:45.870 We could pick up in this way and So what

NOTE Confidence: 0.884373486042023

00:14:45.945 --> 00:14:49.144 are the potential applications for Koba 19?

NOTE Confidence: 0.884373486042023

00:14:49.150 --> 00:14:49.380 Well,

NOTE Confidence: 0.884373486042023

00:14:49.380 --> 00:14:51.915 the first one is we want to know do these

NOTE Confidence: 0.884373486042023

00:14:51.915 --> 00:14:53.930 pan viral biomarkers pickup COVID-19.

NOTE Confidence: 0.884373486042023

00:14:53.930 --> 00:14:55.730 It's possible it could be different,

NOTE Confidence: 0.884373486042023

00:14:55.730 --> 00:14:56.522 and if so,

NOTE Confidence: 0.884373486042023

00:14:56.522 --> 00:14:59.020 how can this help us fight the pandemic,

NOTE Confidence: 0.884373486042023

00:14:59.020 --> 00:15:01.029 so there's a lot of more ideas

NOTE Confidence: 0.884373486042023

00:15:01.029 --> 00:15:02.865 than answers that I have since

NOTE Confidence: 0.884373486042023

00:15:02.865 --> 00:15:04.695 this is a relatively new project,

NOTE Confidence: 0.884373486042023

00:15:04.700 --> 00:15:06.860 but I'll just share some of our early

NOTE Confidence: 0.884373486042023

00:15:06.860 --> 00:15:09.014 data and this project so far has

NOTE Confidence: 0.884373486042023

00:15:09.014 --> 00:15:10.980 been spearheaded by ready chi Marla,

NOTE Confidence: 0.884373486042023

00:15:10.980 --> 00:15:13.196 a postdoc in my lab who's been like

NOTE Confidence: 0.884373486042023

00:15:13.196 --> 00:15:15.516 side by side with me in the lab

NOTE Confidence: 0.884373486042023

00:15:15.516 --> 00:15:17.559 every day since this pandemic hit.

NOTE Confidence: 0.884373486042023

00:15:17.560 --> 00:15:20.040 Trying to do the studies I'm going to.

NOTE Confidence: 0.884373486042023

00:15:20.040 --> 00:15:22.216 Tell you about and get them down the

NOTE Confidence: 0.884373486042023

00:15:22.216 --> 00:15:24.278 road and I also wanted knowledge.

NOTE Confidence: 0.884373486042023

00:15:24.280 --> 00:15:25.520 The lab working group.

NOTE Confidence: 0.884373486042023

00:15:25.520 --> 00:15:27.919 I'll talk about them again at the end.

NOTE Confidence: 0.884373486042023

00:15:27.920 --> 00:15:29.144 Organized by Albert Cohen,

NOTE Confidence: 0.884373486042023

00:15:29.144 --> 00:15:30.980 the School of public health who

NOTE Confidence: 0.884373486042023

00:15:31.034 --> 00:15:32.804 helped us at the beginning all

NOTE Confidence: 0.884373486042023

00:15:32.804 --> 00:15:34.630 get organised together to get the

NOTE Confidence: 0.884373486042023

00:15:34.630 --> 00:15:36.100 PCR testing going for research.

NOTE Confidence: 0.884373486042023

00:15:36.100 --> 00:15:39.005 You sent a support clinical use too.

NOTE Confidence: 0.884373486042023

00:15:39.010 --> 00:15:42.870 And so this is a graph of Cobra 19 Indiana,

NOTE Confidence: 0.884373486042023

00:15:42.870 --> 00:15:44.800 the country in our region.

NOTE Confidence: 0.884373486042023

00:15:44.800 --> 00:15:46.344 Green is the country.

NOTE Confidence: 0.884373486042023

00:15:46.344 --> 00:15:48.660 The first case was in January.

NOTE Confidence: 0.884373486042023

00:15:48.660 --> 00:15:50.640 But in our region of Connecticut,

NOTE Confidence: 0.884373486042023

00:15:50.640 --> 00:15:51.606 in New York,

NOTE Confidence: 0.884373486042023

00:15:51.606 --> 00:15:53.538 the first case was shown in

NOTE Confidence: 0.884373486042023

00:15:53.538 --> 00:15:55.260 the blue on March 2nd,

NOTE Confidence: 0.884373486042023

00:15:55.260 --> 00:15:57.696 Connecticut first case it was in

NOTE Confidence: 0.884373486042023

00:15:57.696 --> 00:15:59.670 Fairfield County on March 6th.

NOTE Confidence: 0.884373486042023

00:15:59.670 --> 00:16:02.106 And our testing began on March 13th,

NOTE Confidence: 0.884373486042023

00:16:02.110 --> 00:16:03.860 which is actually very fast.

NOTE Confidence: 0.884373486042023

00:16:03.860 --> 00:16:05.732 You may recall there is some

NOTE Confidence: 0.884373486042023

00:16:05.732 --> 00:16:08.196 snafus with the CDC test and they

NOTE Confidence: 0.884373486042023

00:16:08.196 --> 00:16:10.111 allowed high complexity in clinical

NOTE Confidence: 0.884373486042023

00:16:10.111 --> 00:16:12.638 labs like ours to do their own

NOTE Confidence: 0.884373486042023

00:16:12.638 --> 00:16:14.328 test starting on February 29th.

NOTE Confidence: 0.884373486042023

00:16:14.330 --> 00:16:16.622 Anna Marie Landry and the folks

NOTE Confidence: 0.884373486042023

00:16:16.622 --> 00:16:18.832 in the clinical virology lab had

NOTE Confidence: 0.884373486042023

00:16:18.832 --> 00:16:20.953 it up and running by March 13th.

NOTE Confidence: 0.884373486042023

00:16:20.960 --> 00:16:22.700 So very fast, but nonetheless,

NOTE Confidence: 0.884373486042023

00:16:22.700 --> 00:16:25.150 given the patterns that we see here,

NOTE Confidence: 0.884373486042023

00:16:25.150 --> 00:16:25.780 we wondered,

NOTE Confidence: 0.884373486042023

00:16:25.780 --> 00:16:27.985 did we miss any cases in those

NOTE Confidence: 0.884373486042023

00:16:27.985 --> 00:16:30.100 weeks before our testing started?

NOTE Confidence: 0.884373486042023

00:16:30.100 --> 00:16:32.263 So we performed a screen of the

NOTE Confidence: 0.884373486042023

00:16:32.263 --> 00:16:34.392 about the two weeks before testing

NOTE Confidence: 0.884373486042023

00:16:34.392 --> 00:16:37.031 started as shown on this Gray bar.

NOTE Confidence: 0.884373486042023

00:16:37.040 --> 00:16:38.099 And, uh, first,

NOTE Confidence: 0.884373486042023

00:16:38.099 --> 00:16:40.570 so during this time period a lot

NOTE Confidence: 0.895463764667511

00:16:40.650 --> 00:16:43.380 of people have been tested on that

NOTE Confidence: 0.895463764667511

00:16:43.380 --> 00:16:45.843 complete panel for 15 viruses and

NOTE Confidence: 0.895463764667511

00:16:45.843 --> 00:16:47.868 376 patients who are symptomatic

NOTE Confidence: 0.895463764667511

00:16:47.868 --> 00:16:49.841 and had suspected viral infection

NOTE Confidence: 0.895463764667511

00:16:49.841 --> 00:16:51.776 were negative for other viruses.

NOTE Confidence: 0.895463764667511

00:16:51.780 --> 00:16:53.336 So we thought, well,

NOTE Confidence: 0.895463764667511

00:16:53.336 --> 00:16:56.440 maybe some of those might have had SARS,

NOTE Confidence: 0.895463764667511

00:16:56.440 --> 00:16:58.762 Kobe 2 and we screened with

NOTE Confidence: 0.895463764667511

00:16:58.762 --> 00:16:59.923 the button marker.

NOTE Confidence: 0.895463764667511

00:16:59.930 --> 00:17:02.394 I mentioned CL 10 and out of

NOTE Confidence: 0.895463764667511

00:17:02.394 --> 00:17:04.200 all those negative patients,

NOTE Confidence: 0.895463764667511

00:17:04.200 --> 00:17:06.664 only about a tenth of them were

NOTE Confidence: 0.895463764667511

00:17:06.664 --> 00:17:08.530 positive for the biomarker.

NOTE Confidence: 0.895463764667511

00:17:08.530 --> 00:17:10.852 So it seems a good setup like these are

NOTE Confidence: 0.895463764667511

00:17:10.852 --> 00:17:13.298 people who tested negative for other viruses,

NOTE Confidence: 0.895463764667511

00:17:13.300 --> 00:17:14.284 but there's symptomatic.

NOTE Confidence: 0.895463764667511

00:17:14.284 --> 00:17:15.924 It may have a biomarker

NOTE Confidence: 0.895463764667511

00:17:15.924 --> 00:17:17.600 that a viral infection,

NOTE Confidence: 0.895463764667511

00:17:17.600 --> 00:17:19.520 their bodies fighting a viral infection.

NOTE Confidence: 0.895463764667511

00:17:19.520 --> 00:17:21.416 So then we tested all these

NOTE Confidence: 0.895463764667511

00:17:21.416 --> 00:17:23.360 people for with the PCR test,

NOTE Confidence: 0.895463764667511

00:17:23.360 --> 00:17:25.642 and it turns out that among these

NOTE Confidence: 0.895463764667511

00:17:25.642 --> 00:17:27.290 biomarker positive people were four

NOTE Confidence: 0.895463764667511

00:17:27.290 --> 00:17:29.439 patients who had actually did have SARS,

NOTE Confidence: 0.895463764667511

00:17:29.440 --> 00:17:31.645 Co V2, including some surprises like an

NOTE Confidence: 0.895463764667511

00:17:31.645 --> 00:17:33.920 infant that was seen as an outpatient,

NOTE Confidence: 0.895463764667511

00:17:33.920 --> 00:17:36.489 that that that was a bit of

NOTE Confidence: 0.895463764667511

00:17:36.489 --> 00:17:38.580 a surprise to find that.

NOTE Confidence: 0.895463764667511

00:17:38.580 --> 00:17:39.300 And unfortunately,

NOTE Confidence: 0.895463764667511

00:17:39.300 --> 00:17:40.740 being here at Yale,

NOTE Confidence: 0.895463764667511

00:17:40.740 --> 00:17:42.900 we have so many great collaborators

NOTE Confidence: 0.895463764667511

00:17:42.900 --> 00:17:43.980 with different expertise,

NOTE Confidence: 0.895463764667511

00:17:43.980 --> 00:17:46.108 we were able to ask Nate Grubaugh

NOTE Confidence: 0.895463764667511

00:17:46.108 --> 00:17:48.747 slab in the school of public health

NOTE Confidence: 0.895463764667511

00:17:48.747 --> 00:17:50.812 to sequence those for isolates.

NOTE Confidence: 0.895463764667511

00:17:50.820 --> 00:17:53.095 This was a paper earlier published by

NOTE Confidence: 0.895463764667511

00:17:53.095 --> 00:17:55.118 the group lab showing using sequencing

NOTE Confidence: 0.895463764667511

00:17:55.118 --> 00:17:58.296 of the virus that a lot of the early

NOTE Confidence: 0.895463764667511

00:17:58.296 --> 00:18:00.371 cases coming to Connecticut were

NOTE Confidence: 0.895463764667511

00:18:00.371 --> 00:18:02.340 from transmission that were domestic

NOTE Confidence: 0.895463764667511

00:18:02.340 --> 00:18:04.860 rather than international an the four cases.

NOTE Confidence: 0.895463764667511

00:18:04.860 --> 00:18:07.020 I hope you can see this,

NOTE Confidence: 0.895463764667511

00:18:07.020 --> 00:18:08.830 but the four cases that.

NOTE Confidence: 0.895463764667511

00:18:08.830 --> 00:18:09.154 Uh,

NOTE Confidence: 0.895463764667511

00:18:09.154 --> 00:18:11.746 we had picked up in those early weeks.

NOTE Confidence: 0.895463764667511

00:18:11.750 --> 00:18:13.370 Kind of fit this pattern.

NOTE Confidence: 0.895463764667511

00:18:13.370 --> 00:18:15.512 Three of the case is shown

NOTE Confidence: 0.895463764667511

00:18:15.512 --> 00:18:17.859 with the sort of red lines.

NOTE Confidence: 0.895463764667511

00:18:17.860 --> 00:18:20.348 They do a track most closely with North

NOTE Confidence: 0.895463764667511

00:18:20.348 --> 00:18:22.146 American other isolates from North

NOTE Confidence: 0.895463764667511

00:18:22.146 --> 00:18:24.372 America as opposed to other countries.

NOTE Confidence: 0.895463764667511

00:18:24.380 --> 00:18:26.828 And then there was one that tracked most

NOTE Confidence: 0.895463764667511

00:18:26.828 --> 00:18:29.180 closest to strains from Western Europe.

NOTE Confidence: 0.895463764667511

00:18:29.180 --> 00:18:31.588 So this kind of fit the pattern will

NOTE Confidence: 0.895463764667511

00:18:31.588 --> 00:18:33.978 also is really interesting to me.

NOTE Confidence: 0.895463764667511

00:18:33.980 --> 00:18:36.508 Is that all these for patients that came

NOTE Confidence: 0.895463764667511

00:18:36.508 --> 00:18:38.945 within a couple of days the hospital

NOTE Confidence: 0.895463764667511

00:18:38.945 --> 00:18:41.106 none of their viruses were directly

NOTE Confidence: 0.895463764667511

00:18:41.106 --> 00:18:43.584 related were the same as the other,

NOTE Confidence: 0.895463764667511

00:18:43.590 --> 00:18:44.958 so this is independent

NOTE Confidence: 0.895463764667511

00:18:44.958 --> 00:18:45.984 introductions coming in,

NOTE Confidence: 0.895463764667511

00:18:45.990 --> 00:18:48.454 which was also probably says something about

NOTE Confidence: 0.895463764667511

00:18:48.454 --> 00:18:51.159 travel back and forth and things like that.

NOTE Confidence: 0.895463764667511

00:18:51.160 --> 00:18:52.972 So that was quite an interesting

NOTE Confidence: 0.895463764667511

00:18:52.972 --> 00:18:54.987 bonus of being a in collaboration

NOTE Confidence: 0.895463764667511

00:18:54.987 --> 00:18:56.837 with other folks at Yale.

NOTE Confidence: 0.895463764667511

00:18:56.840 --> 00:18:58.600 To find more information

NOTE Confidence: 0.895463764667511

00:18:58.600 --> 00:18:59.920 about those patients.

NOTE Confidence: 0.895463764667511

00:18:59.920 --> 00:19:00.256 Uhm,

NOTE Confidence: 0.895463764667511

00:19:00.256 --> 00:19:03.740 but we also had an idea just looking at this.

NOTE Confidence: 0.895463764667511

00:19:03.740 --> 00:19:05.124 Well this is interesting.

NOTE Confidence: 0.895463764667511

00:19:05.124 --> 00:19:06.854 Like here we used up,

NOTE Confidence: 0.895463764667511

00:19:06.860 --> 00:19:08.942 you know 376 PCR test to

NOTE Confidence: 0.895463764667511

00:19:08.942 --> 00:19:10.330 test all these patients.

NOTE Confidence: 0.895463764667511

00:19:10.330 --> 00:19:13.003 But really if we had only tested the 33

NOTE Confidence: 0.895463764667511

00:19:13.003 --> 00:19:15.540 that were positive for the biomarker,

NOTE Confidence: 0.895463764667511

00:19:15.540 --> 00:19:18.308 we still would have found all the cases.

NOTE Confidence: 0.895463764667511

00:19:18.310 --> 00:19:20.122 And so it suggested maybe this

NOTE Confidence: 0.895463764667511

00:19:20.122 --> 00:19:22.130 is a way of expanding,

NOTE Confidence: 0.895463764667511

00:19:22.130 --> 00:19:22.958 like conserving,

NOTE Confidence: 0.895463764667511

00:19:22.958 --> 00:19:24.614 testing capacity or directing

NOTE Confidence: 0.895463764667511

00:19:24.614 --> 00:19:26.946 it towards people who really are

NOTE Confidence: 0.895463764667511

00:19:26.946 --> 00:19:28.466 high suspicion to be positive

NOTE Confidence: 0.895463764667511

00:19:28.466 --> 00:19:30.847 and so we tried that so far just.

NOTE Confidence: 0.895463764667511

00:19:30.850 --> 00:19:31.831 Piloted one day.

NOTE Confidence: 0.895463764667511

00:19:31.831 --> 00:19:33.793 We picked one day in March

NOTE Confidence: 0.895463764667511

00:19:33.793 --> 00:19:36.143 where we were able to get all

NOTE Confidence: 0.895463764667511

00:19:36.143 --> 00:19:37.447 the residual samples from

NOTE Confidence: 0.881870329380035

00:19:37.523 --> 00:19:39.388 testing went 144 patients were

NOTE Confidence: 0.881870329380035

00:19:39.388 --> 00:19:41.954 tested that day for SARS, Co V2.

NOTE Confidence: 0.881870329380035

00:19:41.954 --> 00:19:44.730 And did the biomarker test an what you

NOTE Confidence: 0.881870329380035

00:19:44.811 --> 00:19:47.899 can see is again as a smaller proportion

NOTE Confidence: 0.881870329380035

00:19:47.899 --> 00:19:50.908 of people were positive than negative.

NOTE Confidence: 0.881870329380035

00:19:50.910 --> 00:19:53.339 And then we compared this to the

NOTE Confidence: 0.881870329380035

00:19:53.339 --> 00:19:55.852 results from the PCR testing and it

NOTE Confidence: 0.881870329380035

00:19:55.852 --> 00:19:58.357 turned out that 17 people were PCR

NOTE Confidence: 0.881870329380035

00:19:58.357 --> 00:20:00.779 positive for SARS Kobe to that day.

NOTE Confidence: 0.881870329380035

00:20:00.780 --> 00:20:02.760 And 16 of them were among

NOTE Confidence: 0.881870329380035

00:20:02.760 --> 00:20:03.750 the biomarker positive,

NOTE Confidence: 0.881870329380035

00:20:03.750 --> 00:20:05.822 but one wasn't one was did not

NOTE Confidence: 0.881870329380035

00:20:05.822 --> 00:20:07.380 have the biomarker expressed,

NOTE Confidence: 0.881870329380035

00:20:07.380 --> 00:20:08.970 and that patient also happened

NOTE Confidence: 0.881870329380035

00:20:08.970 --> 00:20:11.340 to have a very low viral load,

NOTE Confidence: 0.881870329380035

00:20:11.340 --> 00:20:12.990 which is kind of something

NOTE Confidence: 0.881870329380035

00:20:12.990 --> 00:20:14.310 we're following up on.

NOTE Confidence: 0.881870329380035

00:20:14.310 --> 00:20:17.280 So if we had had all 17 up here,

NOTE Confidence: 0.881870329380035

00:20:17.280 --> 00:20:18.930 we could have said are

NOTE Confidence: 0.881870329380035

00:20:18.930 --> 00:20:19.920 negative predictive value.

NOTE Confidence: 0.881870329380035

00:20:19.920 --> 00:20:21.900 If you're negative on this biomarker,

NOTE Confidence: 0.881870329380035

00:20:21.900 --> 00:20:24.210 you don't have the virus is 100%,

NOTE Confidence: 0.881870329380035

00:20:24.210 --> 00:20:26.190 but we can't say that we

NOTE Confidence: 0.881870329380035

00:20:26.190 --> 00:20:28.340 have to say 99% because of.

NOTE Confidence: 0.881870329380035

00:20:28.340 --> 00:20:31.660 This this one patient out of out of

NOTE Confidence: 0.881870329380035

00:20:31.757 --> 00:20:35.117 the 144 that were screened and tested.

NOTE Confidence: 0.881870329380035

00:20:35.120 --> 00:20:38.192 Um, so we that got us interested in

NOTE Confidence: 0.881870329380035

00:20:38.192 --> 00:20:40.429 biological variables and how they

NOTE Confidence: 0.881870329380035

00:20:40.429 --> 00:20:42.759 impact this biomarker that's induces

NOTE Confidence: 0.881870329380035

00:20:42.759 --> 00:20:45.185 approaching that's induced by viral

NOTE Confidence: 0.881870329380035

00:20:45.185 --> 00:20:47.077 replication within the epithelial

NOTE Confidence: 0.881870329380035

00:20:47.077 --> 00:20:49.212 cells and possibly infiltrating cells.

NOTE Confidence: 0.881870329380035

00:20:49.212 --> 00:20:51.704 And we looked at all the positive

NOTE Confidence: 0.881870329380035

00:20:51.704 --> 00:20:53.330 patients in our initial study,

NOTE Confidence: 0.881870329380035

00:20:53.330 --> 00:20:54.306 which was 59 patients.

NOTE Confidence: 0.881870329380035

00:20:54.306 --> 00:20:56.147 If you look at their age distribution

NOTE Confidence: 0.881870329380035

00:20:56.147 --> 00:20:58.415 there mostly in the older age groups,

NOTE Confidence: 0.881870329380035

00:20:58.420 --> 00:21:01.250 and if you look at the symptoms by age group,

NOTE Confidence: 0.881870329380035

00:21:01.250 --> 00:21:02.834 the people in the older age

NOTE Confidence: 0.881870329380035

00:21:02.834 --> 00:21:04.360 groups had more serious illness.

NOTE Confidence: 0.881870329380035

00:21:04.360 --> 00:21:06.446 As you might expect much more likely

NOTE Confidence: 0.881870329380035

00:21:06.446 --> 00:21:08.442 to be hospitalised and have things

NOTE Confidence: 0.881870329380035

00:21:08.442 --> 00:21:09.834 like pneumonia and hypoxemia.

NOTE Confidence: 0.881870329380035

00:21:09.840 --> 00:21:10.522 So, uhm,

NOTE Confidence: 0.881870329380035

00:21:10.522 --> 00:21:12.227 So what about the correlation

NOTE Confidence: 0.881870329380035

00:21:12.227 --> 00:21:13.250 with the biomarker?

NOTE Confidence: 0.881870329380035

00:21:13.250 --> 00:21:15.301 Well, if you look at, uh,

NOTE Confidence: 0.881870329380035

00:21:15.301 --> 00:21:17.347 if you look at viral load

NOTE Confidence: 0.881870329380035

00:21:17.347 --> 00:21:18.370 versus the biomarker,

NOTE Confidence: 0.881870329380035

00:21:18.370 --> 00:21:19.730 there's a positive correlation.

NOTE Confidence: 0.881870329380035

00:21:19.730 --> 00:21:21.090 As you might expect.

NOTE Confidence: 0.881870329380035

00:21:21.090 --> 00:21:22.550 Because, as I mentioned,

NOTE Confidence: 0.881870329380035

00:21:22.550 --> 00:21:24.740 the trigger for production of this

NOTE Confidence: 0.881870329380035

00:21:24.802 --> 00:21:26.718 biomarker is viral replication.

NOTE Confidence: 0.881870329380035

00:21:26.720 --> 00:21:27.053 Um,

NOTE Confidence: 0.881870329380035

00:21:27.053 --> 00:21:28.718 interesting if you look at

NOTE Confidence: 0.881870329380035

00:21:28.718 --> 00:21:30.050 age versus the biomarker,

NOTE Confidence: 0.881870329380035

00:21:30.050 --> 00:21:31.526 there's a negative correlation

NOTE Confidence: 0.881870329380035

00:21:31.526 --> 00:21:33.740 where this biomarker is lower and

NOTE Confidence: 0.881870329380035

00:21:33.804 --> 00:21:35.708 the people with the older age is.

NOTE Confidence: 0.881870329380035

00:21:35.710 --> 00:21:38.090 But there doesn't seem to be a

NOTE Confidence: 0.881870329380035

00:21:38.090 --> 00:21:39.492 clear correlation between agent

NOTE Confidence: 0.881870329380035

00:21:39.492 --> 00:21:41.370 viral load in this same group,

NOTE Confidence: 0.881870329380035

00:21:41.370 --> 00:21:43.040 so we're still investigating this.

NOTE Confidence: 0.881870329380035

00:21:43.040 --> 00:21:45.175 So we actually struck up a collaboration

NOTE Confidence: 0.881870329380035

00:21:45.175 --> 00:21:46.700 with the Pediatrics Department,

NOTE Confidence: 0.881870329380035

00:21:46.700 --> 00:21:48.695 including Tom Murray and Danielle

NOTE Confidence: 0.881870329380035

00:21:48.695 --> 00:21:51.069 Pediatrics to delve into this further

NOTE Confidence: 0.881870329380035

00:21:51.069 --> 00:21:53.549 and see if we can figure out what's

NOTE Confidence: 0.881870329380035

00:21:53.549 --> 00:21:55.766 going on with this age correlation.

NOTE Confidence: 0.881870329380035

00:21:55.770 --> 00:22:00.063 I so finally I just want to mention um,

NOTE Confidence: 0.881870329380035

00:22:00.070 --> 00:22:02.700 what's ahead for this project?

NOTE Confidence: 0.881870329380035

00:22:02.700 --> 00:22:04.470 I mentioned from these headlines

NOTE Confidence: 0.881870329380035

00:22:04.470 --> 00:22:06.900 some of the challenges and we would

NOTE Confidence: 0.881870329380035

00:22:06.900 --> 00:22:08.400 like to know Kenneth biomarker

NOTE Confidence: 0.881870329380035

00:22:08.400 --> 00:22:11.010 help us to the question of who has

NOTE Confidence: 0.881870329380035

00:22:11.010 --> 00:22:12.991 live infectious virus versus is a

NOTE Confidence: 0.881870329380035

00:22:12.991 --> 00:22:14.977 persistent PCR positive but not infectious.

NOTE Confidence: 0.881870329380035

00:22:14.980 --> 00:22:16.978 Anna question everyone always asked me.

NOTE Confidence: 0.881870329380035

00:22:16.980 --> 00:22:18.966 I'm just going to preempt it.

NOTE Confidence: 0.881870329380035

00:22:18.970 --> 00:22:21.426 It would be great to know what this

NOTE Confidence: 0.881870329380035

00:22:21.426 --> 00:22:23.948 this type of biomarker an in general,

NOTE Confidence: 0.881870329380035

00:22:23.950 --> 00:22:25.936 what the host response to infection,

NOTE Confidence: 0.881870329380035

00:22:25.940 --> 00:22:28.022 how it's changing overtime during the

NOTE Confidence: 0.881870329380035

00:22:28.022 --> 00:22:30.590 course of what can be a long illness.

NOTE Confidence: 0.881870329380035

00:22:30.590 --> 00:22:33.257 And so we're actively looking at that

NOTE Confidence: 0.881870329380035

00:22:33.257 --> 00:22:36.006 right now. And I just want to finish.

NOTE Confidence: 0.898455262184143

00:22:36.010 --> 00:22:38.530 I just want to nod my head to a

NOTE Confidence: 0.898455262184143

00:22:38.530 --> 00:22:40.376 project that actually was going

NOTE Confidence: 0.898455262184143

00:22:40.376 --> 00:22:42.980 on a lab before the pandemic hit.

NOTE Confidence: 0.898455262184143

00:22:42.980 --> 00:22:44.051 Briefly got pause.

NOTE Confidence: 0.898455262184143

00:22:44.051 --> 00:22:46.550 Dan is getting restarted now of trying

NOTE Confidence: 0.898455262184143

00:22:46.618 --> 00:22:48.574 to find the next pandemic virus

NOTE Confidence: 0.898455262184143

00:22:48.574 --> 00:22:50.820 before it hits using this strategy.

NOTE Confidence: 0.898455262184143

00:22:50.820 --> 00:22:52.860 And this was spearheaded by Amelia

NOTE Confidence: 0.898455262184143

00:22:52.860 --> 00:22:55.334 Hammer in a Yale School of Public

NOTE Confidence: 0.898455262184143

00:22:55.334 --> 00:22:57.069 Health Masters student who is

NOTE Confidence: 0.898455262184143

00:22:57.069 --> 00:22:59.568 in my lab but graduated in 2019.

NOTE Confidence: 0.898455262184143

00:22:59.570 --> 00:23:01.754 And our idea there was the same

NOTE Confidence: 0.898455262184143

00:23:01.754 --> 00:23:04.515 idea of let's look at people who

NOTE Confidence: 0.898455262184143

00:23:04.515 --> 00:23:06.263 their doctors suspected viral

NOTE Confidence: 0.898455262184143

00:23:06.263 --> 00:23:07.839 infection sent the test.

NOTE Confidence: 0.898455262184143

00:23:07.840 --> 00:23:09.586 They tested negative for all the

NOTE Confidence: 0.898455262184143

00:23:09.586 --> 00:23:11.750 viruses on our panel and see if we

NOTE Confidence: 0.898455262184143

00:23:11.750 --> 00:23:13.531 can find people who who looks like

NOTE Confidence: 0.898455262184143

00:23:13.531 --> 00:23:15.373 their body was fighting a viral

NOTE Confidence: 0.898455262184143

00:23:15.373 --> 00:23:17.071 infection and maybe they have a

NOTE Confidence: 0.898455262184143

00:23:17.071 --> 00:23:18.613 viral infection that we don't know

NOTE Confidence: 0.898455262184143

00:23:18.613 --> 00:23:20.726 of so we can find out what other

NOTE Confidence: 0.898455262184143

00:23:20.726 --> 00:23:22.195 viruses are causing disease in

NOTE Confidence: 0.898455262184143

00:23:22.195 --> 00:23:23.795 our patient population that were

NOTE Confidence: 0.898455262184143

00:23:23.795 --> 00:23:25.570 not catching with our panel.

NOTE Confidence: 0.898455262184143

00:23:25.570 --> 00:23:28.405 And so Amelia just took one week

NOTE Confidence: 0.898455262184143

00:23:28.405 --> 00:23:31.458 of January 2017 and screens 250.

NOTE Confidence: 0.898455262184143

00:23:31.460 --> 00:23:33.992 One negative samples with our biomarker

NOTE Confidence: 0.898455262184143

00:23:33.992 --> 00:23:36.319 that we talked about here CL.

NOTE Confidence: 0.898455262184143

00:23:36.320 --> 00:23:39.434 10 and she had 60 of them that were

NOTE Confidence: 0.898455262184143

00:23:39.434 --> 00:23:42.206 had high levels of the biomarker

NOTE Confidence: 0.898455262184143

00:23:42.206 --> 00:23:43.604 at that time.

NOTE Confidence: 0.898455262184143

00:23:43.610 --> 00:23:45.848 We were not doing testing for

NOTE Confidence: 0.898455262184143

00:23:45.848 --> 00:23:47.340 the seasonal coronaviruses or

NOTE Confidence: 0.898455262184143

00:23:47.412 --> 00:23:48.870 parrot influenza virus.

NOTE Confidence: 0.898455262184143

00:23:48.870 --> 00:23:52.515 4 so she did that testing an interesting Lee.

NOTE Confidence: 0.898455262184143

00:23:52.520 --> 00:23:54.650 Half of these patients had

NOTE Confidence: 0.898455262184143

00:23:54.650 --> 00:23:55.928 seasonal coronaviruses and

NOTE Confidence: 0.898455262184143

00:23:55.928 --> 00:23:57.800 that actually tipped our hat.

NOTE Confidence: 0.898455262184143

00:23:57.800 --> 00:23:59.468 Let us know that seasonal Corona

NOTE Confidence: 0.898455262184143

00:23:59.468 --> 00:24:01.216 viruses are circulating in our patient

NOTE Confidence: 0.898455262184143

00:24:01.216 --> 00:24:02.676 population and actually Marie Landry

NOTE Confidence: 0.898455262184143

00:24:02.676 --> 00:24:04.876 has now added that to the clinical panel.

NOTE Confidence: 0.898455262184143

00:24:04.880 --> 00:24:06.488 So now that is those four

NOTE Confidence: 0.898455262184143

00:24:06.488 --> 00:24:07.990 viruses are on our panel,

NOTE Confidence: 0.898455262184143

00:24:07.990 --> 00:24:10.014 but this also as a proof of concept

NOTE Confidence: 0.898455262184143

00:24:10.014 --> 00:24:12.308 that our strategy works of picking up

NOTE Confidence: 0.898455262184143

00:24:12.308 --> 00:24:14.790 viral infections that we're not testing for.

NOTE Confidence: 0.898455262184143

00:24:14.790 --> 00:24:15.340 Um, Interestingly,

NOTE Confidence: 0.898455262184143

00:24:15.340 --> 00:24:16.990 we also have half the samples

NOTE Confidence: 0.898455262184143

00:24:16.990 --> 00:24:17.930 where we didn't.

NOTE Confidence: 0.898455262184143

00:24:17.930 --> 00:24:19.415 We still don't know exact

NOTE Confidence: 0.898455262184143

00:24:19.415 --> 00:24:21.350 well for some of them we do,

NOTE Confidence: 0.898455262184143

00:24:21.350 --> 00:24:23.888 but many of them we don't know what what

NOTE Confidence: 0.898455262184143

00:24:23.888 --> 00:24:25.619 infectious agents are in the sample,

NOTE Confidence: 0.898455262184143

00:24:25.620 --> 00:24:27.330 and we're working that up and

NOTE Confidence: 0.898455262184143

00:24:27.330 --> 00:24:28.470 finding some interesting things,

NOTE Confidence: 0.898455262184143

00:24:28.470 --> 00:24:31.035 and we hope this will be a good strategy.

NOTE Confidence: 0.898455262184143

00:24:31.040 --> 00:24:33.280 Going forward to get an even more

NOTE Confidence: 0.898455262184143

00:24:33.280 --> 00:24:34.929 comprehensive view of the viruses

NOTE Confidence: 0.898455262184143

00:24:34.929 --> 00:24:37.127 that are circulating so we can be

NOTE Confidence: 0.898455262184143

00:24:37.127 --> 00:24:39.188 prepared for ones that we aren't

NOTE Confidence: 0.898455262184143

00:24:39.188 --> 00:24:40.873 necessarily testing for right now.

NOTE Confidence: 0.898455262184143

00:24:40.880 --> 00:24:43.100 So, just to summarize, um,

NOTE Confidence: 0.898455262184143

00:24:43.100 --> 00:24:43.501 uh,

NOTE Confidence: 0.898455262184143

00:24:43.501 --> 00:24:45.907 we're interested in studying the host

NOTE Confidence: 0.898455262184143

00:24:45.907 --> 00:24:48.409 response to fight coronavirus today.

NOTE Confidence: 0.898455262184143

00:24:48.410 --> 00:24:50.700 I talked about diagnostic applications

NOTE Confidence: 0.898455262184143

00:24:50.700 --> 00:24:53.579 were also really interested in getting

NOTE Confidence: 0.898455262184143

00:24:53.579 --> 00:24:56.179 insights into early stage pathogenesis.

NOTE Confidence: 0.898455262184143

00:24:56.180 --> 00:24:58.436 And how this differs among people

NOTE Confidence: 0.898455262184143

00:24:58.436 --> 00:24:59.940 who have different outcomes.

NOTE Confidence: 0.898455262184143

00:24:59.940 --> 00:25:00.328 Uhm,

NOTE Confidence: 0.898455262184143

00:25:00.328 --> 00:25:03.044 I talked about a host response based

NOTE Confidence: 0.898455262184143

00:25:03.044 --> 00:25:05.759 screening test that we've been working on,

NOTE Confidence: 0.898455262184143

00:25:05.760 --> 00:25:08.310 which allowed us to identify for

NOTE Confidence: 0.898455262184143

00:25:08.310 --> 00:25:10.450 undiagnosed cases from early March

NOTE Confidence: 0.898455262184143

00:25:10.450 --> 00:25:12.664 and we're looking at other utilities

NOTE Confidence: 0.898455262184143

00:25:12.664 --> 00:25:15.620 to sort of fill in the gaps in

NOTE Confidence: 0.898455262184143

00:25:15.620 --> 00:25:17.395 some of our testing strategies,

NOTE Confidence: 0.898455262184143

00:25:17.400 --> 00:25:19.596 and hopefully I'll be able to

NOTE Confidence: 0.898455262184143

00:25:19.596 --> 00:25:23.132 update you in a future talk on our

NOTE Confidence: 0.898455262184143

00:25:23.132 --> 00:25:25.617 undiagnosed viruses project as well.

NOTE Confidence: 0.898455262184143

00:25:25.620 --> 00:25:27.560 I saw with that before,

NOTE Confidence: 0.898455262184143

00:25:27.560 --> 00:25:31.034 I conclude I'd like to thank all the many,

NOTE Confidence: 0.898455262184143

00:25:31.040 --> 00:25:33.356 many people in this Yale environment

NOTE Confidence: 0.898455262184143

00:25:33.356 --> 00:25:34.900 have contributed to projects

NOTE Confidence: 0.896027147769928

00:25:34.966 --> 00:25:36.454 on COVID-19. Definitely could

NOTE Confidence: 0.896027147769928

00:25:36.454 --> 00:25:38.776 have been done in a silo.

NOTE Confidence: 0.896027147769928

00:25:38.780 --> 00:25:41.587 It was very great to have lots

NOTE Confidence: 0.896027147769928

00:25:41.587 --> 00:25:43.839 of collaborators an it still is.

NOTE Confidence: 0.896027147769928

00:25:43.840 --> 00:25:46.290 I want to acknowledge my my lab

NOTE Confidence: 0.896027147769928

00:25:46.290 --> 00:25:47.980 members including ready tomorrow.

NOTE Confidence: 0.896027147769928

00:25:47.980 --> 00:25:50.230 I mentioned who spearheaded the project.

NOTE Confidence: 0.896027147769928

00:25:50.230 --> 00:25:52.491 I talked about as well as Marie

NOTE Confidence: 0.896027147769928

00:25:52.491 --> 00:25:55.119 Landry on the clinical virology lab,

NOTE Confidence: 0.896027147769928

00:25:55.120 --> 00:25:57.376 especially Marino in and Robin Garner,

NOTE Confidence: 0.896027147769928

00:25:57.380 --> 00:25:59.260 who really helped us alot.

NOTE Confidence: 0.896027147769928

00:25:59.260 --> 00:26:01.135 Dezhen Zou, who's been helping

NOTE Confidence: 0.896027147769928

00:26:01.135 --> 00:26:02.260 with our bioinformatics,

NOTE Confidence: 0.896027147769928

00:26:02.260 --> 00:26:04.899 I didn't really talk about that today,

NOTE Confidence: 0.896027147769928

00:26:04.900 --> 00:26:08.275 but he's been a great help the whole group,

NOTE Confidence: 0.896027147769928

00:26:08.280 --> 00:26:11.104 all lab and Nate grew bath for their

NOTE Confidence: 0.896027147769928

00:26:11.104 --> 00:26:12.692 constant participation and help

NOTE Confidence: 0.896027147769928

00:26:12.692 --> 00:26:14.328 with the molecular Epidemiology.

NOTE Confidence: 0.896027147769928

00:26:14.330 --> 00:26:17.146 As well as lab working group depicted here

NOTE Confidence: 0.896027147769928

00:26:17.146 --> 00:26:20.108 from March 2nd which includes Albert Konate,

NOTE Confidence: 0.896027147769928

00:26:20.110 --> 00:26:22.798 grew Bhasa Domer Akiko Isaki Marie Landreau.

NOTE Confidence: 0.896027147769928

00:26:22.800 --> 00:26:24.075 That's me actually.

NOTE Confidence: 0.896027147769928

00:26:24.075 --> 00:26:27.050 And this was back when there's only

NOTE Confidence: 0.896027147769928

00:26:27.135 --> 00:26:29.685 45,000 global cases on March 2nd.

NOTE Confidence: 0.896027147769928

00:26:29.690 --> 00:26:30.762 Uh, so with that?

NOTE Confidence: 0.896027147769928

00:26:30.762 --> 00:26:32.906 Uhm, I think I made up some time.

NOTE Confidence: 0.896027147769928

00:26:32.910 --> 00:26:34.779 Uh, in in speaking a little quickly,

NOTE Confidence: 0.896027147769928

00:26:34.780 --> 00:26:36.388 but hopefully you're able to follow.

NOTE Confidence: 0.896027147769928

00:26:36.390 --> 00:26:38.208 And if there's any questions I

NOTE Confidence: 0.896027147769928

00:26:38.208 --> 00:26:40.499 would be happy to answer them now.

NOTE Confidence: 0.896027147769928

00:26:40.500 --> 00:26:41.150 Thank you

NOTE Confidence: 0.932004988193512

00:26:41.150 --> 00:26:43.112 Ellen. Thank you and congratulations to

NOTE Confidence: 0.932004988193512

00:26:43.112 --> 00:26:45.616 you and your entire research group on that

NOTE Confidence: 0.932004988193512

00:26:45.616 --> 00:26:47.739 impressive body of work in a relatively

NOTE Confidence: 0.932004988193512

00:26:47.739 --> 00:26:49.929 short time to address the pandemic.

NOTE Confidence: 0.932004988193512

00:26:49.930 --> 00:26:51.898 and I know we're just about

NOTE Confidence: 0.932004988193512

00:26:51.898 --> 00:26:54.148 the top of the hour or so,

NOTE Confidence: 0.932004988193512

00:26:54.150 --> 00:26:56.100 and if folks can submit questions,

NOTE Confidence: 0.932004988193512

00:26:56.100 --> 00:26:58.700 but let me just offer up a couple.

NOTE Confidence: 0.932004988193512

00:26:58.700 --> 00:26:59.678 One is specifically.

NOTE Confidence: 0.932004988193512

00:26:59.678 --> 00:27:01.848 I mean, I think the work you're doing

NOTE Confidence: 0.932004988193512

00:27:01.848 --> 00:27:04.116 on sort of the biomarkers is really

NOTE Confidence: 0.932004988193512

00:27:04.116 --> 00:27:06.498 interesting in terms of testing strategy,

NOTE Confidence: 0.932004988193512

00:27:06.500 --> 00:27:08.125 and you mentioned that you're

NOTE Confidence: 0.932004988193512

00:27:08.125 --> 00:27:09.750 anticipating one of my questions,

NOTE Confidence: 0.932004988193512

00:27:09.750 --> 00:27:11.634 which was, how does it change

NOTE Confidence: 0.932004988193512

00:27:11.634 --> 00:27:13.749 over the course of the illness?

NOTE Confidence: 0.932004988193512

00:27:13.750 --> 00:27:14.647 But I'm curious,

NOTE Confidence: 0.932004988193512

00:27:14.647 --> 00:27:17.153 do we have a sense of biomarkers that

NOTE Confidence: 0.932004988193512

00:27:17.153 --> 00:27:19.241 might predict the severity of illness

NOTE Confidence: 0.932004988193512

00:27:19.241 --> 00:27:21.375 that is almost to predict who's

NOTE Confidence: 0.932004988193512

00:27:21.375 --> 00:27:23.427 more likely to need more intensive

NOTE Confidence: 0.932004988193512

00:27:23.427 --> 00:27:25.440 care at the time of diagnosis?

NOTE Confidence: 0.932838261127472

00:27:26.140 --> 00:27:28.336 Yeah, that that's very interesting people.

NOTE Confidence: 0.932838261127472

00:27:28.340 --> 00:27:30.804 There's been a some work already published

NOTE Confidence: 0.932838261127472

00:27:30.804 --> 00:27:33.360 about blood like cytokines in the blood

NOTE Confidence: 0.932838261127472

00:27:33.360 --> 00:27:35.150 that could be indicated indicative

NOTE Confidence: 0.932838261127472

00:27:35.150 --> 00:27:37.486 of that we're looking even earlier.

NOTE Confidence: 0.932838261127472

00:27:37.490 --> 00:27:40.289 I mean it at the at the early stage

NOTE Confidence: 0.932838261127472

00:27:40.289 --> 00:27:42.234 of infection, the nasopharynx.

NOTE Confidence: 0.932838261127472

00:27:42.234 --> 00:27:44.406 And that's one reason why we're

NOTE Confidence: 0.932838261127472

00:27:44.406 --> 00:27:46.278 really interested in this potential

NOTE Confidence: 0.932838261127472

00:27:46.278 --> 00:27:48.093 difference between adults and kids.

NOTE Confidence: 0.932838261127472

00:27:48.100 --> 00:27:49.186 Because, you know,

NOTE Confidence: 0.932838261127472

00:27:49.186 --> 00:27:51.358 kids are seem relatively protected from

NOTE Confidence: 0.932838261127472

00:27:51.358 --> 00:27:53.220 pulmonary disease compared to adults,

NOTE Confidence: 0.932838261127472

00:27:53.220 --> 00:27:53.850 older adults.

NOTE Confidence: 0.932838261127472

00:27:53.850 --> 00:27:55.740 So that's one reason why we

NOTE Confidence: 0.932838261127472

00:27:55.740 --> 00:27:57.727 struck up this collaboration with

NOTE Confidence: 0.932838261127472

00:27:57.727 --> 00:27:59.887 Pediatrics to try to understand.

NOTE Confidence: 0.932838261127472

00:27:59.890 --> 00:28:02.046 Is there some difference in the robustness

NOTE Confidence: 0.932838261127472

00:28:02.046 --> 00:28:04.350 of that initial response that could you

NOTE Confidence: 0.932838261127472

00:28:04.350 --> 00:28:06.330 know that could possibly explain this?

NOTE Confidence: 0.932838261127472

00:28:06.330 --> 00:28:07.293 There's many explanations,

NOTE Confidence: 0.932838261127472

00:28:07.293 --> 00:28:08.256 but that's one,

NOTE Confidence: 0.932838261127472

00:28:08.260 --> 00:28:10.339 so that's that's the kind of thing

NOTE Confidence: 0.932838261127472

00:28:10.339 --> 00:28:12.448 we're going to we're looking into,

NOTE Confidence: 0.932838261127472

00:28:12.450 --> 00:28:14.697 but I don't have the answer yet.

NOTE Confidence: 0.932838261127472

00:28:14.700 --> 00:28:17.902 This is it's very rare to give a talk on a

NOTE Confidence: 0.932838261127472

00:28:17.902 --> 00:28:20.499 project that started like two months ago,

NOTE Confidence: 0.932838261127472

00:28:20.500 --> 00:28:22.796 but so that's why there's a more

NOTE Confidence: 0.932838261127472

00:28:22.796 --> 00:28:24.678 questions than answers at this point,

NOTE Confidence: 0.932838261127472

00:28:24.680 --> 00:28:26.934 but we hope to find that out.

NOTE Confidence: 0.932838261127472

00:28:26.940 --> 00:28:28.550 We're looking at the whole.

NOTE Confidence: 0.932838261127472

00:28:28.550 --> 00:28:30.536 The entire pattern of gene expression.

NOTE Confidence: 0.932838261127472

00:28:30.540 --> 00:28:33.177 Um and not just this one biomarker to try

NOTE Confidence: 0.932838261127472

00:28:33.177 --> 00:28:35.973 to get it that in some specific groups

NOTE Confidence: 0.932838261127472

00:28:35.973 --> 00:28:38.350 of patients with different outcomes.

NOTE Confidence: 0.908663034439087

00:28:38.940 --> 00:28:41.604 So you know just to follow up on that.

NOTE Confidence: 0.908663034439087

00:28:41.610 --> 00:28:43.991 So do we think that, uh, I mean,

NOTE Confidence: 0.908663034439087

00:28:43.991 --> 00:28:45.179 likely the airway response.

NOTE Confidence: 0.908663034439087

00:28:45.180 --> 00:28:46.665 It is before the subsequent

NOTE Confidence: 0.908663034439087

00:28:46.665 --> 00:28:48.150 sort of larger immune response.

NOTE Confidence: 0.908663034439087

00:28:48.150 --> 00:28:49.630 The airway response is likely

NOTE Confidence: 0.908663034439087

00:28:49.630 --> 00:28:50.814 very different across ages.

NOTE Confidence: 0.908663034439087

00:28:50.820 --> 00:28:52.731 And you think that could be one

NOTE Confidence: 0.908663034439087

00:28:52.731 --> 00:28:54.715 of the major explanations why age

NOTE Confidence: 0.908663034439087

00:28:54.715 --> 00:28:56.911 is such a strong predictor for

NOTE Confidence: 0.908663034439087

00:28:56.911 --> 00:28:58.710 outcome in this illness. Possibly

NOTE Confidence: 0.879945635795593

00:28:58.710 --> 00:29:00.612 possibly, I'd like to have the

NOTE Confidence: 0.879945635795593

00:29:00.612 --> 00:29:02.790 data to answer you definitively,

NOTE Confidence: 0.879945635795593

00:29:02.790 --> 00:29:04.278 so hopefully will have

NOTE Confidence: 0.879945635795593

00:29:04.280 --> 00:29:05.768 that soon. Yeah, well,

NOTE Confidence: 0.879945635795593

00:29:05.768 --> 00:29:08.000 it sounds like more to follow.

NOTE Confidence: 0.879945635795593

00:29:08.000 --> 00:29:10.345 Well, channel and for two really superb

NOTE Confidence: 0.879945635795593

00:29:10.345 --> 00:29:12.560 talks and the work that they do.

NOTE Confidence: 0.879945635795593

00:29:12.560 --> 00:29:14.849 Thank you all for joining us today.

NOTE Confidence: 0.879945635795593

00:29:14.850 --> 00:29:17.554 I know a lot of folks also watch

NOTE Confidence: 0.879945635795593

00:29:17.554 --> 00:29:20.570 online as we as the labs reopened but.

NOTE Confidence: 0.879945635795593

00:29:20.570 --> 00:29:22.397 Enjoy the rest of your day and

NOTE Confidence: 0.879945635795593

00:29:22.397 --> 00:29:23.936 thank you all for your work.

NOTE Confidence: 0.879945635795593

00:29:23.936 --> 00:29:24.970 Thank you very much.