WEBVTT

NOTE duration:"00:29:27.1680000"

NOTE language:en-us

NOTE Confidence: 0.917529582977295

 $00:00:00.000 \rightarrow 00:00:02.820$ But if you have additional questions,

NOTE Confidence: 0.917529582977295

 $00:00:02.820 \rightarrow 00:00:06.540$ 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

 $00{:}00{:}12.378 \dashrightarrow 00{:}00{:}15.834$ 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

 $00:00:21.000 \rightarrow 00:00:23.640$ Hospital before coming to yell and

NOTE Confidence: 0.917529582977295

 $00:00:23.640 \dashrightarrow 00:00:26.540$ 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

 $00{:}00{:}28.765 \dashrightarrow 00{:}00{:}30.990$ the immune responses and natural

NOTE Confidence: 0.917529582977295

 $00:00:31.058 \rightarrow 00:00:33.098$ responses to respiratory viruses.

NOTE Confidence: 0.917529582977295

 $00:00:33.100 \longrightarrow 00:00:34.670$ Which is certainly a very

NOTE Confidence: 0.917529582977295

 $00:00:34.670 \longrightarrow 00:00:35.926$ timely topic of research.

- NOTE Confidence: 0.917529582977295
- 00:00:35.930 --> 00:00:36.842 Uh, in 2020?
- NOTE Confidence: 0.917529582977295
- $00:00:36.842 \rightarrow 00:00:39.355$ So we were really pleased that Alan could
- NOTE Confidence: 0.917529582977295
- $00{:}00{:}39{.}355 \dashrightarrow 00{:}00{:}42{.}208$ take the time to share her research with us.
- NOTE Confidence: 0.917529582977295
- $00:00:42.210 \longrightarrow 00:00:43.462$ So Ellen, thank you.
- NOTE Confidence: 0.917529582977295
- 00:00:43.462 --> 00:00:44.400 Thank you. I'm
- NOTE Confidence: 0.926282286643982
- $00:00:44.400 \rightarrow 00:00:45.636$ 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
- $00:00:47.560 \longrightarrow 00:00:49.426$ share the screen and it will.
- NOTE Confidence: 0.926282286643982
- $00:00:49.430 \longrightarrow 00:00:52.150$ 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
- $00:01:03.640 \dashrightarrow 00:01:06.214$ I'm very happy to be here even though it's
- NOTE Confidence: 0.908503115177155
- $00{:}01{:}06{.}214 \dashrightarrow 00{:}01{:}08{.}963$ by zoom an be able to participate in my
- NOTE Confidence: 0.908503115177155
- $00:01:08.963 \dashrightarrow 00:01:11.350$ 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
- $00:01:12.845 \longrightarrow 00:01:14.880$ 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
- $00:01:17.450 \rightarrow 00:01:20.369$ which is also a topic on everyone's.
- NOTE Confidence: 0.908503115177155
- $00:01:20.370 \longrightarrow 00:01:21.930$ 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
- $00:01:24.716 \longrightarrow 00:01:27.208$ the work our lab has been doing.
- NOTE Confidence: 0.908503115177155
- $00:01:27.210 \dashrightarrow 00:01:29.345$ Looking at host response based
- NOTE Confidence: 0.908503115177155
- $00:01:29.345 \longrightarrow 00:01:31.480$ detection of respiratory virus an
- NOTE Confidence: 0.908503115177155
- $00:01:31.552 \rightarrow 00:01:34.088$ specifically applications to COVID-19.
- NOTE Confidence: 0.908503115177155
- 00:01:34.090 --> 00:01:35.500 OK, so uh,
- NOTE Confidence: 0.908503115177155
- $00:01:35.500 \longrightarrow 00:01:38.790$ this is just a disclosure that I'm
- NOTE Confidence: 0.908503115177155
- $00:01:38.900 \rightarrow 00:01:43.499$ going to inventor on to patent applications.
- NOTE Confidence: 0.908503115177155
- $00:01:43.500 \rightarrow 00:01:46.076$ So today I'll be talking about why are
- NOTE Confidence: 0.908503115177155
- $00:01:46.076 \rightarrow 00:01:49.028$ we interested in studying the early host
- NOTE Confidence: 0.908503115177155
- 00:01:49.028 --> 00:01:50.820 responses against respiratory viruses,

 $00:01:50.820 \longrightarrow 00:01:53.130$ 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

 $00:01:54.282 \rightarrow 00:01:56.586$ 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

 $00{:}01{:}58{.}385 \dashrightarrow 00{:}02{:}00{.}672$ on the basics of Cobra 19

NOTE Confidence: 0.908503115177155

 $00{:}02{:}00{.}672 \dashrightarrow 00{:}02{:}02{.}747$ diagnostics an I'll talk about,

NOTE Confidence: 0.908503115177155

 $00:02:02.750 \longrightarrow 00:02:05.053$ then a project that we've been doing

NOTE Confidence: 0.908503115177155

 $00{:}02{:}05{.}053 \dashrightarrow 00{:}02{:}07{.}349$ since March on screening using host

NOTE Confidence: 0.908503115177155

 $00{:}02{:}07{.}349 \dashrightarrow 00{:}02{:}09{.}827$ biomarkers for this disease and then

NOTE Confidence: 0.908503115177155

 $00:02:09.827 \rightarrow 00:02:11.990$ 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

 $00{:}02{:}21{.}219 \dashrightarrow 00{:}02{:}24{.}466$ I had from a talk I gave at the end of

NOTE Confidence: 0.902029097080231

 $00:02:24.466 \rightarrow 00:02:26.222$ November to the virology faculty group,

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

NOTE Confidence: 0.902029097080231

 $00{:}02{:}28.350 \dashrightarrow 00{:}02{:}30.345$ It looks so different in the lens

NOTE Confidence: 0.902029097080231

 $00{:}02{:}30{.}345 \dashrightarrow 00{:}02{:}31{.}901$ 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

 $00:02:33.820 \longrightarrow 00:02:35.845$ So I I used to start my talk by

NOTE Confidence: 0.902029097080231

 $00:02:35.845 \rightarrow 00:02:37.706$ 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

 $00:02:39.290 \longrightarrow 00:02:41.418$ 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

 $00:02:42.026 \rightarrow 00:02:43.238$ even before this pandemic,

NOTE Confidence: 0.902029097080231

 $00{:}02{:}43.240 \dashrightarrow 00{:}02{:}44.302$ these infections cause.

NOTE Confidence: 0.902029097080231

 $00:02:44.302 \longrightarrow 00:02:45.718$ Over 500 million infections

NOTE Confidence: 0.902029097080231

 $00:02:45.718 \rightarrow 00:02:47.229$ per year in the US,

NOTE Confidence: 0.902029097080231

 $00:02:47.230 \longrightarrow 00:02:49.750$ so that's more than one per person and

NOTE Confidence: 0.902029097080231

 $00{:}02{:}49.750 \dashrightarrow 00{:}02{:}52.429$ granted a lot of those are common colds,

NOTE Confidence: 0.902029097080231

 $00:02:52.430 \longrightarrow 00:02:54.050$ but some of those are

- NOTE Confidence: 0.902029097080231
- $00:02:54.050 \longrightarrow 00:02:55.346$ serious illnesses such as.
- NOTE Confidence: 0.902029097080231
- $00{:}02{:}55{.}350 \dashrightarrow 00{:}02{:}57{.}074$ Influenza with hospitalization or
- NOTE Confidence: 0.902029097080231
- $00{:}02{:}57.074 \dashrightarrow 00{:}02{:}59.229$ hospitalization for asthma attack or
- NOTE Confidence: 0.902029097080231
- $00:02:59.229 \dashrightarrow 00:03:01.414$ CEO PD Exacerbation which are very
- NOTE Confidence: 0.902029097080231
- $00{:}03{:}01{.}414 \dashrightarrow 00{:}03{:}03{.}525$ often caused by virus es and also
- NOTE Confidence: 0.902029097080231
- $00{:}03{:}03{.}525 \dashrightarrow 00{:}03{:}05{.}691$ there has been this emerging this
- NOTE Confidence: 0.902029097080231
- $00:03:05.691 \rightarrow 00:03:07.162$ lingering concern about emerging
- NOTE Confidence: 0.902029097080231
- $00:03:07.162 \longrightarrow 00:03:08.690$ infections with good reason.
- NOTE Confidence: 0.902029097080231
- $00{:}03{:}08{.}690 \dashrightarrow 00{:}03{:}11{.}042$ As we know now and I usually put
- NOTE Confidence: 0.902029097080231
- $00:03:11.042 \rightarrow 00:03:13.332$ up this photo to describe that
- NOTE Confidence: 0.902029097080231
- $00:03:13.332 \rightarrow 00:03:15.357$ that's actually a picture of
- NOTE Confidence: 0.902029097080231
- $00{:}03{:}15{.}357 \dashrightarrow 00{:}03{:}17{.}828$ the SARS coronavirus from 2003.
- NOTE Confidence: 0.902029097080231
- $00:03:17.830 \dashrightarrow 00:03:20.679$ But now when we see these pictures
- NOTE Confidence: 0.902029097080231
- $00{:}03{:}20.679 \dashrightarrow 00{:}03{:}22.653$ it definitely conjures up something
- NOTE Confidence: 0.902029097080231
- $00:03:22.653 \longrightarrow 00:03:24.687$ else in all of our minds,
- NOTE Confidence: 0.902029097080231

 $00:03:24.690 \rightarrow 00:03:28.137$ which is the 2nd SARS Coronavirus SARS Co V2.

NOTE Confidence: 0.902029097080231

 $00{:}03{:}28{.}140 \dashrightarrow 00{:}03{:}30{.}216$ 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

 $00{:}03{:}34{.}640 \dashrightarrow 00{:}03{:}36{.}506$ there's over 7 million cases and

NOTE Confidence: 0.902029097080231

 $00:03:36.573 \longrightarrow 00:03:38.253$ over 400,000 deaths described

NOTE Confidence: 0.902029097080231

 $00:03:38.253 \longrightarrow 00:03:39.933$ globally from Cobra 19,

NOTE Confidence: 0.902029097080231

 $00:03:39.940 \rightarrow 00:03:42.708$ so this is definitely having a high impact.

NOTE Confidence: 0.902029097080231

 $00{:}03{:}42{.}710 \dashrightarrow 00{:}03{:}44{.}395$ It's impacting our seminar that

NOTE Confidence: 0.902029097080231

 $00{:}03{:}44{.}395 \dashrightarrow 00{:}03{:}46{.}530$ were having if I zoom today,

NOTE Confidence: 0.902029097080231

 $00:03:46.530 \longrightarrow 00:03:47.966$ it's impacting our work.

NOTE Confidence: 0.902029097080231

 $00{:}03{:}47{.}966 \dashrightarrow 00{:}03{:}50{.}120$ It's impacting our economy and of

NOTE Confidence: 0.902029097080231

 $00{:}03{:}50{.}183 \dashrightarrow 00{:}03{:}52{.}223$ course our health and there's still

NOTE Confidence: 0.902029097080231

 $00{:}03{:}52{.}223 \dashrightarrow 00{:}03{:}53{.}975$ a lot of unanswered challenges

NOTE Confidence: 0.902029097080231

 $00:03:53.975 \rightarrow 00:03:56.250$ were right in the middle of it.

NOTE Confidence: 0.902029097080231

 $00:03:56.250 \rightarrow 00:03:59.382$ 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
- $00:04:01.980 \longrightarrow 00:04:03.420$ there will be long-term impacts,
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}03.420 \dashrightarrow 00{:}04{:}05.478$ both on the health of the respiratory
- NOTE Confidence: 0.902029097080231
- $00:04:05.478 \rightarrow 00:04:08.039$ system in the patients who are recovering.
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}08{.}040 \dashrightarrow 00{:}04{:}09{.}828$ Or have recovered and we also
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}09{.}828 \dashrightarrow 00{:}04{:}11{.}980$ have to think what lessons can we
- NOTE Confidence: 0.902029097080231
- $00:04:11.980 \longrightarrow 00:04:14.066$ learn from this that are going to
- NOTE Confidence: 0.902029097080231
- $00:04:14.133 \dashrightarrow 00:04:16.059$ help us with the next pandemic.
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}16.060 \dashrightarrow 00{:}04{:}18.886$ So this is sort of a just a screen shot
- NOTE Confidence: 0.902029097080231
- $00:04:18.886 \rightarrow 00:04:21.585$ of my labs homepage to remind me to
- NOTE Confidence: 0.902029097080231
- $00:04:21.585 \longrightarrow 00:04:24.038$ tell you a little bit about what
- NOTE Confidence: 0.902029097080231
- $00:04:24.038 \longrightarrow 00:04:26.438$ we do a little bit more broadly,
- NOTE Confidence: 0.902029097080231
- $00:04:26.438 \longrightarrow 00:04:28.406$ we really focus on the lining
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}28{.}406 \dashrightarrow 00{:}04{:}29{.}800$ of the respiratory tract,
- NOTE Confidence: 0.902029097080231
- $00{:}04{:}29{.}800 \dashrightarrow 00{:}04{:}32{.}806$ the airway mucosa as you see in this picture.
- NOTE Confidence: 0.902029097080231

 $00{:}04{:}32{.}810 \dashrightarrow 00{:}04{:}34{.}754$ This is actually what the epithelial

NOTE Confidence: 0.902029097080231

 $00{:}04{:}34{.}754 \dashrightarrow 00{:}04{:}37{.}168$ layer in the upper airway looks like,

NOTE Confidence: 0.902029097080231

 $00{:}04{:}37{.}170 \dashrightarrow 00{:}04{:}38{.}840$ and these are these cells.

NOTE Confidence: 0.902029097080231

 $00:04:38.840 \rightarrow 00:04:40.700$ The epithelial cells are the target

NOTE Confidence: 0.902029097080231

 $00{:}04{:}40{.}700 \dashrightarrow 00{:}04{:}42{.}720$ cells of viral infection and virus es

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

 $00{:}04{:}46{.}290 \dashrightarrow 00{:}04{:}48{.}733$ And these cells also are the first

NOTE Confidence: 0.902029097080231

 $00{:}04{:}48.733 \dashrightarrow 00{:}04{:}50.664$ line of defense that recognizes

NOTE Confidence: 0.902029097080231

 $00{:}04{:}50{.}664 \dashrightarrow 00{:}04{:}53{.}094$ 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

 $00{:}04{:}55{.}651 \dashrightarrow 00{:}04{:}57{.}980$ the area and also sends out turns

NOTE Confidence: 0.902029097080231

 $00{:}04{:}57{.}980 \dashrightarrow 00{:}04{:}59{.}930$ on affecter mechanisms to try to

NOTE Confidence: 0.902029097080231

 $00:04:59.930 \dashrightarrow 00:05:02.108$ stop the virus from replicating.

NOTE Confidence: 0.902029097080231

 $00:05:02.110 \longrightarrow 00:05:03.582$ So there are very.

NOTE Confidence: 0.902029097080231

 $00:05:03.582 \dashrightarrow 00:05:05.790$ It's a very highly active tissue.

- NOTE Confidence: 0.90692675113678
- $00:05:05.790 \longrightarrow 00:05:06.861$ The airway mucosa.
- NOTE Confidence: 0.90692675113678
- $00:05:06.861 \longrightarrow 00:05:09.003$ 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
- $00:05:10.950 \dashrightarrow 00:05:13.146$ and we're also interested in repair.
- NOTE Confidence: 0.90692675113678
- $00:05:13.150 \longrightarrow 00:05:14.490$ Actually, because after the.
- NOTE Confidence: 0.90692675113678
- $00:05:14.490 \longrightarrow 00:05:16.500$ 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
- $00:05:17.700 \longrightarrow 00:05:19.200$ but rather only when damage
- NOTE Confidence: 0.90692675113678
- $00:05:19.200 \longrightarrow 00:05:20.410$ does it then regenerate,
- NOTE Confidence: 0.90692675113678
- $00:05:20.410 \longrightarrow 00:05:22.384$ but it has the potential for these
- NOTE Confidence: 0.90692675113678
- $00:05:22.384 \longrightarrow 00:05:24.310$ stem cells that you see here at
- NOTE Confidence: 0.90692675113678
- $00{:}05{:}24.310 \dashrightarrow 00{:}05{:}25.834$ the base of the epithelium to
- NOTE Confidence: 0.90692675113678
- $00{:}05{:}25.895 \dashrightarrow 00{:}05{:}27.930$ proliferate and recreate that issue.
- NOTE Confidence: 0.90692675113678
- $00{:}05{:}27{.}930 \dashrightarrow 00{:}05{:}29{.}508$ And one thing we're interested in
- NOTE Confidence: 0.90692675113678
- $00:05:29.508 \dashrightarrow 00:05:31.314$ is how come that sometimes goes
- NOTE Confidence: 0.90692675113678

 $00:05:31.314 \rightarrow 00:05:33.044$ right and sometimes goes wrong,

NOTE Confidence: 0.90692675113678

 $00{:}05{:}33{.}050 \dashrightarrow 00{:}05{:}34{.}898$ and sometimes when it goes wrong

NOTE Confidence: 0.90692675113678

 $00{:}05{:}34.898 \dashrightarrow 00{:}05{:}37.000$ that leads to cancer and that I

NOTE Confidence: 0.90692675113678

 $00{:}05{:}37{.}000 \dashrightarrow 00{:}05{:}38{.}876$ hopefully I'll be able to come back

NOTE Confidence: 0.90692675113678

 $00{:}05{:}38{.}934 \dashrightarrow 00{:}05{:}40{.}818$ for a different grounds and talk

NOTE Confidence: 0.90692675113678

 $00{:}05{:}40.818 \dashrightarrow 00{:}05{:}42.608$ 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

 $00{:}05{:}46{.}350 \dashrightarrow 00{:}05{:}48{.}170$ As the gate keeper against infection,

NOTE Confidence: 0.90692675113678

 $00:05:48.170 \longrightarrow 00:05:50.276$ so most of the pathogens that

NOTE Confidence: 0.90692675113678

 $00:05:50.276 \longrightarrow 00:05:52.487$ come into our airway come in

NOTE Confidence: 0.90692675113678

 $00:05:52.487 \rightarrow 00:05:54.695$ through the nose and mouth throat,

NOTE Confidence: 0.90692675113678

 $00:05:54.700 \dashrightarrow 00:05:56.878$ and this includes virus es and bacteria.

NOTE Confidence: 0.90692675113678

 $00{:}05{:}56{.}880 \dashrightarrow 00{:}05{:}58{.}698$ And often if that infection can

NOTE Confidence: 0.90692675113678

 $00:05:58.698 \rightarrow 00:06:01.422$ be nipped in the Bud in the upper

NOTE Confidence: 0.90692675113678

 $00:06:01.422 \longrightarrow 00:06:02.862$ respiratory tract that protects

- NOTE Confidence: 0.90692675113678
- $00{:}06{:}02.862 \dashrightarrow 00{:}06{:}04.888$ the rest of the respiratory
- NOTE Confidence: 0.90692675113678
- $00:06:04.888 \longrightarrow 00:06:06.943$ system from that that infectious
- NOTE Confidence: 0.90692675113678
- $00:06:06.943 \dashrightarrow 00:06:09.066$ agent getting down to the lungs.
- NOTE Confidence: 0.90692675113678
- $00{:}06{:}09{.}066 \dashrightarrow 00{:}06{:}11{.}010$ So when these offense defenses are
- NOTE Confidence: 0.90692675113678
- $00{:}06{:}11.073 \dashrightarrow 00{:}06{:}13.575$ effective in the upper respiratory tract,
- NOTE Confidence: 0.90692675113678
- $00:06:13.580 \longrightarrow 00:06:15.692$ it can really be the difference
- NOTE Confidence: 0.90692675113678
- $00:06:15.692 \rightarrow 00:06:17.620$ between miles or asymptomatic illness.
- NOTE Confidence: 0.90692675113678
- $00:06:17.620 \longrightarrow 00:06:18.944$ 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
- $00{:}06{:}23.610 \dashrightarrow 00{:}06{:}25.662$ but other viruses that often there
- NOTE Confidence: 0.90692675113678
- $00{:}06{:}25{.}662 \dashrightarrow 00{:}06{:}27{.}368$ cleared from the become their
- NOTE Confidence: 0.90692675113678
- $00{:}06{:}27.368 \dashrightarrow 00{:}06{:}29.279$ detectable in a way for a time.
- NOTE Confidence: 0.90692675113678
- $00{:}06{:}29{.}280 \dashrightarrow 00{:}06{:}30{.}144$ A short time.
- NOTE Confidence: 0.90692675113678

 $00:06:30.144 \rightarrow 00:06:32.160$ They and they are cleared without the

NOTE Confidence: 0.90692675113678

 $00:06:32.225 \rightarrow 00:06:34.319$ patient knowing that they were there.

NOTE Confidence: 0.90692675113678

 $00:06:34.320 \longrightarrow 00:06:35.262$ That can happen,

NOTE Confidence: 0.90692675113678

 $00:06:35.262 \longrightarrow 00:06:37.146$ or you can have the opposite,

NOTE Confidence: 0.90692675113678

 $00:06:37.150 \longrightarrow 00:06:39.388$ 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

 $00:06:40.800 \longrightarrow 00:06:41.928$ that modulate those defenses,

NOTE Confidence: 0.90692675113678

 $00{:}06{:}41{.}930 \dashrightarrow 00{:}06{:}43{.}802$ and we like to think of it as like

NOTE Confidence: 0.90692675113678

 $00{:}06{:}43.802 \dashrightarrow 00{:}06{:}45.538$ a marble sitting on a mountain

NOTE Confidence: 0.90692675113678

 $00:06:45.538 \dashrightarrow 00:06:47.454$ where this is the very beginning

NOTE Confidence: 0.90692675113678

 $00:06:47.454 \longrightarrow 00:06:48.978$ of the immune response.

NOTE Confidence: 0.90692675113678

 $00:06:48.980 \dashrightarrow 00:06:50.425$ That's going to recruit certain

NOTE Confidence: 0.90692675113678

 $00:06:50.425 \longrightarrow 00:06:51.870$ activate certain immune cells in

NOTE Confidence: 0.90692675113678

 $00:06:51.922 \dashrightarrow 00:06:53.464$ the respiratory system and sort of

NOTE Confidence: 0.90692675113678

 $00:06:53.464 \rightarrow 00:06:55.180$ nudging that marble in One Direction.

NOTE Confidence: 0.90692675113678

 $00:06:55.180 \rightarrow 00:06:57.441$ It will roll down the Hill one way,

- NOTE Confidence: 0.90692675113678
- $00:06:57.441 \rightarrow 00:06:59.408$ and you'll get one type of response,
- NOTE Confidence: 0.90692675113678
- $00:06:59.410 \longrightarrow 00:07:01.102$ whereas if you nudge it in
- NOTE Confidence: 0.90692675113678
- $00:07:01.102 \longrightarrow 00:07:01.948$ the other direction,
- NOTE Confidence: 0.90692675113678
- $00:07:01.950 \rightarrow 00:07:03.917$ it can have a very different outcome.
- NOTE Confidence: 0.90692675113678
- $00:07:03.920 \rightarrow 00:07:06.482$ So we're very interested in understanding
- NOTE Confidence: 0.90692675113678
- $00{:}07{:}06.482 \dashrightarrow 00{:}07{:}08.590$ the molecular basis of that.
- NOTE Confidence: 0.90692675113678
- 00:07:08.590 --> 00:07:09.266 So, uhm,
- NOTE Confidence: 0.90692675113678
- $00{:}07{:}09.266 \dashrightarrow 00{:}07{:}12.474$ this is a another picture of this as an
- NOTE Confidence: 0.90692675113678
- $00:07:12.474 \dashrightarrow 00:07:15.048$ upper respiratory tract from a child,
- NOTE Confidence: 0.90692675113678
- $00:07:15.050 \dashrightarrow 00:07:17.366$ and so what's something that's kind
- NOTE Confidence: 0.90692675113678
- $00:07:17.366 \rightarrow 00:07:19.338$ of interesting about this anatomy
- NOTE Confidence: 0.90692675113678
- $00:07:19.338 \dashrightarrow 00:07:21.504$ is I actually just myself today.
- NOTE Confidence: 0.90692675113678
- $00{:}07{:}21.510 \dashrightarrow 00{:}07{:}23.790$ Had a swab for this surveillance
- NOTE Confidence: 0.90692675113678
- $00{:}07{:}23.790 \dashrightarrow 00{:}07{:}24.930$ for the stars,
- NOTE Confidence: 0.90692675113678
- $00{:}07{:}24{.}930 \dashrightarrow 00{:}07{:}27{.}618$ 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

 $00{:}07{:}30.250 \dashrightarrow 00{:}07{:}33.314$ and that swab also collect some of the

NOTE Confidence: 0.90692675113678

 $00:07:33.314 \rightarrow 00:07:36.116$ patients own cells and some of the

NOTE Confidence: 0.90692675113678

 $00:07:36.116 \rightarrow 00:07:38.900$ 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

 $00:07:41.273 \longrightarrow 00:07:43.481$ 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

 $00:07:45.340 \rightarrow 00:07:47.434$ we showed that you can actually

NOTE Confidence: 0.90692675113678

 $00:07:47.434 \rightarrow 00:07:49.648$ detect the patterns of jeans and

NOTE Confidence: 0.90692675113678

 $00{:}07{:}49.648 \dashrightarrow 00{:}07{:}51.898$ proteins being made in the respiratory

NOTE Confidence: 0.90692675113678

 $00{:}07{:}51.898 \dashrightarrow 00{:}07{:}54.060$ tract and the huge changes that

NOTE Confidence: 0.90692675113678

 $00{:}07{:}54.060 \dashrightarrow 00{:}07{:}56.076$ occur in the rapid response to

NOTE Confidence: 0.92956819859418

 $00:07:56.080 \dashrightarrow 00:07:58.426$ 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

 $00:08:00.400 \rightarrow 00:08:02.528$ Co V2, there's you probably have all

NOTE Confidence: 0.92956819859418

 $00:08:02.528 \rightarrow 00:08:04.728$ seen a figure something like this.

- NOTE Confidence: 0.92956819859418
- $00:08:04.730 \rightarrow 00:08:07.386$ And of course this will be refined overtime,
- NOTE Confidence: 0.92956819859418
- $00{:}08{:}07{.}390 \dashrightarrow 00{:}08{:}09{.}422$ but the basic idea seems to be that
- NOTE Confidence: 0.92956819859418
- $00:08:09.422 \longrightarrow 00:08:11.593$ 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
- $00:08:13.598 \rightarrow 00:08:15.716$ replication and those kinds of symptoms.
- NOTE Confidence: 0.92956819859418
- $00:08:15.720 \longrightarrow 00:08:17.582$ Then it moves to the long and
- NOTE Confidence: 0.92956819859418
- $00{:}08{:}17.582 \dashrightarrow 00{:}08{:}19.306$ then in severe cases there's
- NOTE Confidence: 0.92956819859418
- $00:08:19.306 \longrightarrow 00:08:21.038$ a host inflammatory response.
- NOTE Confidence: 0.92956819859418
- $00:08:21.040 \longrightarrow 00:08:23.728$ It causes a lot of damage.
- NOTE Confidence: 0.92956819859418
- $00:08:23.730 \longrightarrow 00:08:24.970$ Um so.
- NOTE Confidence: 0.92956819859418
- $00:08:24.970 \longrightarrow 00:08:27.450$ At this early stage,
- NOTE Confidence: 0.92956819859418
- $00{:}08{:}27{.}450 \dashrightarrow 00{:}08{:}29{.}704$ what we can find out using these
- NOTE Confidence: 0.92956819859418
- $00:08:29.704 \rightarrow 00:08:32.223$ respiratory swabs is what can we think
- NOTE Confidence: 0.92956819859418
- $00{:}08{:}32{.}223 \dashrightarrow 00{:}08{:}34{.}078$ about alternatives and additional things
- NOTE Confidence: 0.92956819859418
- $00{:}08{:}34.078 \dashrightarrow 00{:}08{:}36.827$ we can do for the best diagnosis an even,
- NOTE Confidence: 0.92956819859418

 $00:08:36.830 \longrightarrow 00:08:38.870$ 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

 $00:08:41.333 \rightarrow 00:08:43.433$ very beginning that dictate the way

NOTE Confidence: 0.92956819859418

 $00:08:43.433 \rightarrow 00:08:45.719$ the illness is going to progress?

NOTE Confidence: 0.92956819859418

 $00{:}08{:}45{.}720 \dashrightarrow 00{:}08{:}47{.}048$ So today I'm not.

NOTE Confidence: 0.92956819859418

 $00:08:47.048 \rightarrow 00:08:49.320$ 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

 $00:08:51.610 \longrightarrow 00:08:53.728$ The diagnosis end.

NOTE Confidence: 0.92956819859418

 $00:08:53.730 \rightarrow 00:08:56.338$ So I'll just start with giving a brief

NOTE Confidence: 0.92956819859418

 $00:08:56.338 \rightarrow 00:08:58.948$ overview on diagnostics for a SARS Co V2.

NOTE Confidence: 0.92956819859418

 $00{:}08{:}58{.}950 \dashrightarrow 00{:}09{:}01{.}127$ I know we have a diverse audience

NOTE Confidence: 0.92956819859418

 $00{:}09{:}01{.}127 \dashrightarrow 00{:}09{:}03{.}507$ here an I gave a full length,

NOTE Confidence: 0.92956819859418

 $00{:}09{:}03{.}510 \dashrightarrow 00{:}09{:}03{.}785$ uh,

NOTE Confidence: 0.92956819859418

 $00{:}09{:}03.785 \dashrightarrow 00{:}09{:}05.985$ detailed description of this stuff for one of

NOTE Confidence: 0.92956819859418

 $00:09:05.985 \rightarrow 00:09:08.399$ the Deans workshops that's available online.

NOTE Confidence: 0.92956819859418

 $00:09:08.400 \rightarrow 00:09:10.675$ That this is everything in a nutshell,

- NOTE Confidence: 0.92956819859418
- $00:09:10.680 \longrightarrow 00:09:12.731$ so I'm going to describe the test
- NOTE Confidence: 0.92956819859418
- $00:09:12.731 \rightarrow 00:09:15.247$ that we are currently doing at Yale.
- NOTE Confidence: 0.92956819859418
- $00:09:15.250 \longrightarrow 00:09:16.880$ New Haven for this virus.
- NOTE Confidence: 0.92956819859418
- $00:09:16.880 \dashrightarrow 00:09:18.830$ The first Test answers a question.
- NOTE Confidence: 0.92956819859418
- $00:09:18.830 \longrightarrow 00:09:20.460$ Does the patient have the
- NOTE Confidence: 0.92956819859418
- $00:09:20.460 \rightarrow 00:09:21.438$ 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
- $00:09:23.810 \longrightarrow 00:09:27.194$ Is you do the swab isolate are an RNA.
- NOTE Confidence: 0.92956819859418
- $00:09:27.200 \longrightarrow 00:09:29.090$ 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
- $00{:}09{:}33{.}696 \dashrightarrow 00{:}09{:}36{.}244$ sample an if the answer is yes,
- NOTE Confidence: 0.92956819859418
- $00{:}09{:}36{.}250 \dashrightarrow 00{:}09{:}38{.}842$ it means a patient has the virus or
- NOTE Confidence: 0.92956819859418
- $00{:}09{:}38.842 \dashrightarrow 00{:}09{:}41.088$ the viral RNA and their nasopharynx
- NOTE Confidence: 0.92956819859418
- $00:09:41.088 \longrightarrow 00:09:43.864$ right now and that test is
- NOTE Confidence: 0.92956819859418

 $00:09:43.864 \rightarrow 00:09:45.914$ very specific because we're just

NOTE Confidence: 0.92956819859418

 $00{:}09{:}45{.}914 \dashrightarrow 00{:}09{:}48{.}330$ looking at the genome of this

NOTE Confidence: 0.92956819859418

 $00:09:48.330 \rightarrow 00:09:50.255$ virus and very specific regions.

NOTE Confidence: 0.92956819859418

 $00:09:50.260 \rightarrow 00:09:52.200$ Sensitivity depends on when your

NOTE Confidence: 0.92956819859418

 $00:09:52.200 \dashrightarrow 00:09:53.752$ sampling and sample collection

NOTE Confidence: 0.92956819859418

 $00{:}09{:}53.752 \dashrightarrow 00{:}09{:}55.528$ and a few things like that,

NOTE Confidence: 0.92956819859418

 $00:09:55.530 \dashrightarrow 00:09:58.320$ but it's a highly specific test.

NOTE Confidence: 0.92956819859418

 $00:09:58.320 \longrightarrow 00:09:59.322$ The other question,

NOTE Confidence: 0.92956819859418

 $00:09:59.322 \rightarrow 00:09:59.990$ of course,

NOTE Confidence: 0.92956819859418

 $00:09:59.990 \rightarrow 00:10:02.314$ is did the patient had the infection?

NOTE Confidence: 0.92956819859418

 $00{:}10{:}02{.}320 \dashrightarrow 00{:}10{:}04{.}312$ Is there evidence of past infection

NOTE Confidence: 0.92956819859418

 $00:10:04.312 \rightarrow 00:10:05.308$ and that's serology?

NOTE Confidence: 0.92956819859418

 $00:10:05.310 \longrightarrow 00:10:07.522$ So that's asking has the patient formed

NOTE Confidence: 0.92956819859418

 $00:10:07.522 \longrightarrow 00:10:09.220$ antibodies against the virus because

NOTE Confidence: 0.92956819859418

 $00:10:09.220 \rightarrow 00:10:10.965$ 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

 $00{:}10{:}12.888 \dashrightarrow 00{:}10{:}15.299$ to have an adaptive immune response.

NOTE Confidence: 0.92956819859418

 $00:10:15.300 \longrightarrow 00:10:17.852$ And kudos to our clinical lab for having

NOTE Confidence: 0.92956819859418

 $00:10:17.852 \rightarrow 00:10:20.957$ both of these up and running for awhile now.

NOTE Confidence: 0.92956819859418

 $00:10:20.960 \rightarrow 00:10:22.958$ Marie Landry in the virology lab,

NOTE Confidence: 0.92956819859418

 $00{:}10{:}22.960 \dashrightarrow 00{:}10{:}24.312$ and, uh, Rick Tourism.

NOTE Confidence: 0.92956819859418

 $00:10:24.312 \longrightarrow 00:10:25.664$ The clinical immunology lab

NOTE Confidence: 0.92956819859418

 $00:10:25.664 \rightarrow 00:10:27.689$ have set these up and they're

NOTE Confidence: 0.92956819859418

 $00:10:27.689 \rightarrow 00:10:29.615$ available to order on the patients,

NOTE Confidence: 0.92956819859418

 $00:10:29.620 \rightarrow 00:10:33.350$ 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

 $00:10:35.555 \rightarrow 00:10:37.760$ someone is infected right now.

NOTE Confidence: 0.92956819859418

 $00{:}10{:}37.760 \dashrightarrow 00{:}10{:}39.500$ But there are still challenges.

NOTE Confidence: 0.92956819859418

 $00{:}10{:}39{.}500 \dashrightarrow 00{:}10{:}41{.}922$ Are there still a lot of challenges

NOTE Confidence: 0.92956819859418

 $00:10:41.922 \longrightarrow 00:10:43.679$ that we're facing right now?

NOTE Confidence: 0.92956819859418

 $00{:}10{:}43.680 \dashrightarrow 00{:}10{:}46.109$ One is how to expand testing capacity,

 $00:10:46.110 \longrightarrow 00:10:47.498$ and there's many different

NOTE Confidence: 0.92956819859418

 $00{:}10{:}47{.}498 \dashrightarrow 00{:}10{:}49{.}233$ avenues this can go down.

NOTE Confidence: 0.92956819859418

 $00{:}10{:}49{.}240 \dashrightarrow 00{:}10{:}52{.}021$ There is a group with Nate groove on an

NOTE Confidence: 0.92956819859418

 $00:10:52.021 \rightarrow 00:10:54.459$ Wiley doing great stuff with saliva.

NOTE Confidence: 0.912440240383148

 $00:10:54.460 \longrightarrow 00:10:55.712$ Testing is one way,

NOTE Confidence: 0.912440240383148

 $00{:}10{:}55{.}712 \dashrightarrow 00{:}10{:}57{.}590$ but there are there other ways

NOTE Confidence: 0.912440240383148

 $00:10:57.656 \rightarrow 00:10:59.798$ we can be screening or expanding

NOTE Confidence: 0.912440240383148

 $00:10:59.798 \longrightarrow 00:11:02.025$ testing capacity to help make sure

NOTE Confidence: 0.912440240383148

 $00:11:02.025 \rightarrow 00:11:03.860$ we're not spreading this virus.

NOTE Confidence: 0.912440240383148

 $00:11:03.860 \rightarrow 00:11:07.166$ 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

 $00:11:09.144 \rightarrow 00:11:11.475$ who test positive by the PCR tests

NOTE Confidence: 0.912440240383148

 $00{:}11{:}11{.}475 \dashrightarrow 00{:}11{:}13{.}383$ 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

 $00{:}11{:}15{.}466 \dashrightarrow 00{:}11{:}17{.}283$ a few other observations elsewhere of

NOTE Confidence: 0.912440240383148

 $00:11:17.283 \rightarrow 00:11:19.449$ people who recovered and still test

 $00{:}11{:}19{.}449 \dashrightarrow 00{:}11{:}21{.}444$ positive for a long time but don't seem

NOTE Confidence: 0.912440240383148

 $00:11:21.444 \rightarrow 00:11:23.418$ to spread the virus to their Contacts.

NOTE Confidence: 0.912440240383148

 $00{:}11{:}23{.}420 \dashrightarrow 00{:}11{:}25{.}732$ So how can we tell the difference there

NOTE Confidence: 0.912440240383148

 $00:11:25.732 \rightarrow 00:11:27.550$ and then finally also very important

NOTE Confidence: 0.912440240383148

 $00{:}11{:}27{.}550 \dashrightarrow 00{:}11{:}29{.}994$ is how do we find new virus es that

NOTE Confidence: 0.912440240383148

 $00:11:29.994 \rightarrow 00:11:32.143$ are going to be the next pandemic

NOTE Confidence: 0.912440240383148

 $00:11:32.143 \rightarrow 00:11:34.245$ 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

 $00:11:36.760 \longrightarrow 00:11:38.610$ And so this is one.

NOTE Confidence: 0.912440240383148

 $00{:}11{:}38{.}610 \dashrightarrow 00{:}11{:}41{.}498$ These kind of questions are why we got

NOTE Confidence: 0.912440240383148

 $00:11:41.498 \rightarrow 00:11:43.788$ into looking at the host response.

NOTE Confidence: 0.912440240383148

 $00{:}11{:}43.790 \dashrightarrow 00{:}11{:}45.640$ In addition to understanding pathogenesis.

NOTE Confidence: 0.912440240383148

 $00:11:45.640 \longrightarrow 00:11:48.230$ But sort of on the practical side

NOTE Confidence: 0.912440240383148

 $00{:}11{:}48{.}230 \dashrightarrow 00{:}11{:}51{.}590$ of how can it help us an once is

NOTE Confidence: 0.912440240383148

 $00:11:51.590 \longrightarrow 00:11:53.034$ to die for diagnosis.

 $00:11:53.040 \longrightarrow 00:11:54.890$ We're all familiar with them.

NOTE Confidence: 0.912440240383148

 $00{:}11{:}54.890 \dashrightarrow 00{:}11{:}58.220$ I mean the basic one for infection is fever.

NOTE Confidence: 0.912440240383148

 $00:11:58.220 \longrightarrow 00:12:00.070$ Fever is a host response

NOTE Confidence: 0.912440240383148

 $00:12:00.070 \longrightarrow 00:12:01.550$ to infection and fever.

NOTE Confidence: 0.912440240383148

 $00:12:01.550 \longrightarrow 00:12:02.660$ Is fever elevated?

NOTE Confidence: 0.912440240383148

 $00:12:02.660 \rightarrow 00:12:03.400$ Leukocyte count?

NOTE Confidence: 0.912440240383148

 $00{:}12{:}03{.}400 \dashrightarrow 00{:}12{:}05{.}644$ Those are signs that the patient

NOTE Confidence: 0.912440240383148

 $00:12:05.644 \longrightarrow 00:12:06.766$ has an infection.

NOTE Confidence: 0.912440240383148

 $00{:}12{:}06{.}770 \dashrightarrow 00{:}12{:}08{.}226$ They're not terribly specific,

NOTE Confidence: 0.912440240383148

 $00:12:08.226 \rightarrow 00:12:10.410$ 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

 $00:12:13.990 \longrightarrow 00:12:15.182$ even the fever.

NOTE Confidence: 0.912440240383148

 $00:12:15.182 \rightarrow 00:12:17.434$ But now we can get more granular

NOTE Confidence: 0.912440240383148

 $00{:}12{:}17{.}434 \dashrightarrow 00{:}12{:}19{.}762$ about it that we have much

NOTE Confidence: 0.912440240383148

 $00:12:19.762 \longrightarrow 00:12:21.560$ 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
- $00{:}12{:}22{.}844 \dashrightarrow 00{:}12{:}24{.}770$ patterns of protein expression using Multi
- NOTE Confidence: 0.912440240383148
- $00:12:24.819 \rightarrow 00:12:26.719$ Plex Technologies like transcriptomics an.
- NOTE Confidence: 0.912440240383148
- $00:12:26.720 \longrightarrow 00:12:28.841$ 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
- $00{:}12{:}30{.}510 \dashrightarrow 00{:}12{:}32{.}568$ you don't know what's causing that,
- NOTE Confidence: 0.912440240383148
- $00:12:32.570 \longrightarrow 00:12:35.234$ but if the if that's being caused by a
- NOTE Confidence: 0.912440240383148
- $00:12:35.234 \rightarrow 00:12:37.078$ respiratory virus that's replicating.
- NOTE Confidence: 0.912440240383148
- 00:12:37.080 --> 00:12:37.694 That's activated,
- NOTE Confidence: 0.912440240383148
- $00:12:37.694 \rightarrow 00:12:38.922$ the immune system turned
- NOTE Confidence: 0.912440240383148
- $00:12:38.922 \rightarrow 00:12:40.150$ on antiviral defense is,
- NOTE Confidence: 0.912440240383148
- $00{:}12{:}40{.}150 \dashrightarrow 00{:}12{:}41{.}605$ 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
- $00{:}12{:}43.755 \dashrightarrow 00{:}12{:}45.365$ other things that cause coughing.
- NOTE Confidence: 0.912440240383148
- $00{:}12{:}45{.}370 \dashrightarrow 00{:}12{:}47{.}836$ And if you look at the patterns of Gene
- NOTE Confidence: 0.912440240383148

 $00:12:47.836 \longrightarrow 00:12:50.276$ 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

 $00{:}12{:}53{.}392 \dashrightarrow 00{:}12{:}55{.}977$ diagnosis and and know what's going on.

NOTE Confidence: 0.912440240383148

 $00{:}12{:}55{.}980 \dashrightarrow 00{:}12{:}56{.}730$ And so,

NOTE Confidence: 0.912440240383148

 $00:12:56.730 \longrightarrow 00:12:57.480$ uh, again,

NOTE Confidence: 0.912440240383148

 $00:12:57.480 \rightarrow 00:13:00.650$ this is based on the study from 2018.

NOTE Confidence: 0.912440240383148

 $00:13:00.650 \rightarrow 00:13:02.590$ A very simple question was,

NOTE Confidence: 0.912440240383148

 $00:13:02.590 \rightarrow 00:13:05.656$ are there common patterns to all respiratory

NOTE Confidence: 0.912440240383148

 $00:13:05.656 \rightarrow 00:13:08.428$ viruses that we can look at to say?

NOTE Confidence: 0.912440240383148

 $00{:}13{:}08{.}430 \dashrightarrow 00{:}13{:}10{.}932$ 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

 $00{:}13{:}15{.}430 \dashrightarrow 00{:}13{:}18{.}083$ but in the winter seasons I'm not

NOTE Confidence: 0.912440240383148

 $00:13:18.083 \longrightarrow 00:13:20.468$ talking about this year but in

NOTE Confidence: 0.912440240383148

 $00:13:20.468 \rightarrow 00:13:22.423$ in past years between December,

NOTE Confidence: 0.912440240383148

 $00:13:22.430 \longrightarrow 00:13:24.600$ 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
- $00:13:26.336 \longrightarrow 00:13:28.267$ them for 15 virus es to see.
- NOTE Confidence: 0.912440240383148
- 00:13:28.270 --> 00:13:28.636 Uh,
- NOTE Confidence: 0.912440240383148
- $00:13:28.636 \rightarrow 00:13:30.832$ which virus might be causing their
- NOTE Confidence: 0.912440240383148
- $00:13:30.832 \rightarrow 00:13:32.949$ respiratory symptoms and only about 1/3
- NOTE Confidence: 0.912440240383148
- $00:13:32.949 \rightarrow 00:13:35.182$ of them actually have a viral infection,
- NOTE Confidence: 0.912440240383148
- $00:13:35.190 \longrightarrow 00:13:37.647$ so 2/3 of them may have some
- NOTE Confidence: 0.912440240383148
- $00:13:37.647 \rightarrow 00:13:39.000$ other process going on.
- NOTE Confidence: 0.912440240383148
- $00{:}13{:}39{.}000 \dashrightarrow 00{:}13{:}41{.}254$ So we asked whether we can look
- NOTE Confidence: 0.912440240383148
- $00:13:41.254 \rightarrow 00:13:43.154$ at Biomarkers of the antiviral
- NOTE Confidence: 0.912440240383148
- $00:13:43.154 \rightarrow 00:13:45.304$ response to identify who those
- NOTE Confidence: 0.912440240383148
- $00{:}13{:}45{.}304 \dashrightarrow 00{:}13{:}47{.}469$ patients with viral infection R.
- NOTE Confidence: 0.912440240383148
- $00{:}13{:}47{.}470 \dashrightarrow 00{:}13{:}49{.}690$ And this is to this is
- NOTE Confidence: 0.912440240383148
- $00{:}13{:}49.690 \dashrightarrow 00{:}13{:}51.170$ published something to sum
- NOTE Confidence: 0.884373486042023
- 00:13:51.253 --> 00:13:52.689 it up very quickly,
- NOTE Confidence: 0.884373486042023

 $00{:}13{:}52.690 \dashrightarrow 00{:}13{:}55.165$ but the idea is that we found that jeans

NOTE Confidence: 0.884373486042023

 $00{:}13{:}55{.}165 \dashrightarrow 00{:}13{:}57{.}826$ and proteins that are highly induced

NOTE Confidence: 0.884373486042023

 $00:13:57.826 \rightarrow 00:14:00.141$ during the antiviral interferon response.

NOTE Confidence: 0.884373486042023

 $00:14:00.150 \rightarrow 00:14:02.754$ If you detect those in the nasopharynx,

NOTE Confidence: 0.884373486042023

 $00:14:02.760 \longrightarrow 00:14:05.119$ it's a very good good indicator that

NOTE Confidence: 0.884373486042023

 $00:14:05.119 \longrightarrow 00:14:07.239$ there's a viral infection there,

NOTE Confidence: 0.884373486042023

 $00:14:07.240 \rightarrow 00:14:10.216$ and this colored graph just shows kcil 10.

NOTE Confidence: 0.884373486042023

 $00:14:10.220 \longrightarrow 00:14:12.458$ 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

 $00:14:13.580 \rightarrow 00:14:14.351$ It's a cytokine.

NOTE Confidence: 0.884373486042023

 $00{:}14{:}14{.}351 \dashrightarrow 00{:}14{:}16{.}150$ 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

 $00{:}14{:}17.865 \dashrightarrow 00{:}14{:}19.898$ the level of it highly correlated

NOTE Confidence: 0.884373486042023

 $00:14:19.898 \rightarrow 00:14:21.818$ to the presence of the virus.

NOTE Confidence: 0.884373486042023

 $00:14:21.820 \rightarrow 00:14:24.770$ So this is like the level on a log scale,

NOTE Confidence: 0.884373486042023

 $00{:}14{:}24{.}770 \dashrightarrow 00{:}14{:}26{.}570$ and then these bars indicate

- NOTE Confidence: 0.884373486042023
- $00:14:26.570 \longrightarrow 00:14:28.370$ that there's a virus present.
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}28{.}370 \dashrightarrow 00{:}14{:}30{.}603$ And we did two different studies at
- NOTE Confidence: 0.884373486042023
- $00:14:30.603 \rightarrow 00:14:32.948$ two different times of year with two
- NOTE Confidence: 0.884373486042023
- $00:14:32.948 \longrightarrow 00:14:34.934$ different viruses circulating an in both
- NOTE Confidence: 0.884373486042023
- $00:14:34.995 \rightarrow 00:14:37.603$ of those are represented on these pie charts,
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}37{.}610 \dashrightarrow 00{:}14{:}39{.}455$ which virus es 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
- $00:14:41.357 \longrightarrow 00:14:42.887$ any virus that we test for.
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}42.890 \dashrightarrow 00{:}14{:}45.870$ We could pick up in this way and So what
- NOTE Confidence: 0.884373486042023
- $00:14:45.945 \rightarrow 00:14:49.144$ are the potential applications for Koba 19?
- NOTE Confidence: 0.884373486042023
- 00:14:49.150 --> 00:14:49.380 Well,
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}49{.}380 \dashrightarrow 00{:}14{:}51{.}915$ the first one is we want to know do these
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}51{.}915 \dashrightarrow 00{:}14{:}53{.}930$ pan viral biomarkers pickup COVID-19.
- NOTE Confidence: 0.884373486042023
- $00{:}14{:}53{.}930 \dashrightarrow 00{:}14{:}55{.}730$ It's possible it could be different,
- NOTE Confidence: 0.884373486042023
- $00:14:55.730 \rightarrow 00:14:56.522$ and if so,
- NOTE Confidence: 0.884373486042023

 $00:14:56.522 \rightarrow 00:14:59.020$ how can this help us fight the pandemic,

NOTE Confidence: 0.884373486042023

 $00{:}14{:}59{.}020 \dashrightarrow 00{:}15{:}01{.}029$ so there's a lot of more ideas

NOTE Confidence: 0.884373486042023

 $00{:}15{:}01.029 \dashrightarrow 00{:}15{:}02.865$ than answers that I have since

NOTE Confidence: 0.884373486042023

 $00:15:02.865 \rightarrow 00:15:04.695$ this is a relatively new project,

NOTE Confidence: 0.884373486042023

 $00:15:04.700 \longrightarrow 00:15:06.860$ but I'll just share some of our early

NOTE Confidence: 0.884373486042023

 $00{:}15{:}06{.}860 \dashrightarrow 00{:}15{:}09{.}014$ 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

 $00:15:13.196 \longrightarrow 00:15:15.516$ side by side with me in the lab

NOTE Confidence: 0.884373486042023

 $00:15:15.516 \rightarrow 00:15:17.559$ every day since this pandemic hit.

NOTE Confidence: 0.884373486042023

 $00:15:17.560 \dashrightarrow 00:15:20.040$ Trying to do the studies I'm going to.

NOTE Confidence: 0.884373486042023

 $00:15:20.040 \longrightarrow 00:15:22.216$ 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

 $00:15:24.280 \longrightarrow 00:15:25.520$ The lab working group.

NOTE Confidence: 0.884373486042023

 $00{:}15{:}25{.}520 \dashrightarrow 00{:}15{:}27{.}919$ 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
- $00:15:29.144 \longrightarrow 00:15:30.980$ the School of public health who
- NOTE Confidence: 0.884373486042023
- $00:15:31.034 \longrightarrow 00:15:32.804$ helped us at the beginning all
- NOTE Confidence: 0.884373486042023
- $00:15:32.804 \rightarrow 00:15:34.630$ 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
- $00{:}15{:}36{.}100 \dashrightarrow 00{:}15{:}39{.}005$ 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
- $00:15:42.870 \longrightarrow 00:15:44.800$ the country in our region.
- NOTE Confidence: 0.884373486042023
- $00:15:44.800 \longrightarrow 00:15:46.344$ Green is the country.
- NOTE Confidence: 0.884373486042023
- $00:15:46.344 \rightarrow 00:15:48.660$ 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
- $00{:}15{:}51.606 \dashrightarrow 00{:}15{:}53.538$ the first case was shown in
- NOTE Confidence: 0.884373486042023
- $00:15:53.538 \longrightarrow 00:15:55.260$ 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

 $00{:}16{:}02{.}110 \dashrightarrow 00{:}16{:}03{.}860$ which is actually very fast.

NOTE Confidence: 0.884373486042023

 $00:16:03.860 \longrightarrow 00:16:05.732$ You may recall there is some

NOTE Confidence: 0.884373486042023

 $00:16:05.732 \rightarrow 00:16:08.196$ snafus with the CDC test and they

NOTE Confidence: 0.884373486042023

 $00:16:08.196 \longrightarrow 00:16:10.111$ allowed high complexity in clinical

NOTE Confidence: 0.884373486042023

 $00:16:10.111 \longrightarrow 00:16:12.638$ 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

 $00{:}16{:}16{.}622 \dashrightarrow 00{:}16{:}18{.}832$ in the clinical virology lab had

NOTE Confidence: 0.884373486042023

 $00:16:18.832 \rightarrow 00:16:20.953$ it up and running by March 13th.

NOTE Confidence: 0.884373486042023

 $00:16:20.960 \longrightarrow 00:16:22.700$ So very fast, but nonetheless,

NOTE Confidence: 0.884373486042023

 $00:16:22.700 \longrightarrow 00:16:25.150$ given the patterns that we see here,

NOTE Confidence: 0.884373486042023

 $00:16:25.150 \longrightarrow 00:16:25.780$ we wondered,

NOTE Confidence: 0.884373486042023

 $00:16:25.780 \longrightarrow 00:16:27.985$ did we miss any cases in those

NOTE Confidence: 0.884373486042023

 $00:16:27.985 \rightarrow 00:16:30.100$ weeks before our testing started?

NOTE Confidence: 0.884373486042023

 $00:16:30.100 \longrightarrow 00:16:32.263$ So we performed a screen of the

- NOTE Confidence: 0.884373486042023
- $00:16:32.263 \rightarrow 00:16:34.392$ about the two weeks before testing
- NOTE Confidence: 0.884373486042023
- $00:16:34.392 \longrightarrow 00:16:37.031$ 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
- $00:16:38.099 \rightarrow 00:16:40.570$ so during this time period a lot
- NOTE Confidence: 0.895463764667511
- $00{:}16{:}40.650 \dashrightarrow 00{:}16{:}43.380$ of people have been tested on that
- NOTE Confidence: 0.895463764667511
- $00:16:43.380 \longrightarrow 00:16:45.843$ 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
- $00{:}16{:}47.868 \dashrightarrow 00{:}16{:}49.841$ and had suspected viral infection
- NOTE Confidence: 0.895463764667511
- $00{:}16{:}49{.}841 \dashrightarrow 00{:}16{:}51{.}776$ were negative for other viruses.
- NOTE Confidence: 0.895463764667511
- $00:16:51.780 \longrightarrow 00:16:53.336$ So we thought, well,
- NOTE Confidence: 0.895463764667511
- $00:16:53.336 \rightarrow 00:16:56.440$ maybe some of those might have had SARS,
- NOTE Confidence: 0.895463764667511
- $00{:}16{:}56{.}440 \dashrightarrow 00{:}16{:}58{.}762$ Kobe 2 and we screened with
- NOTE Confidence: 0.895463764667511
- $00{:}16{:}58{.}762 \dashrightarrow 00{:}16{:}59{.}923$ 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
- $00:17:02.394 \longrightarrow 00:17:04.200$ all those negative patients,
- NOTE Confidence: 0.895463764667511

- $00:17:04.200 \longrightarrow 00:17:06.664$ only about a tenth of them were
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}06.664 \dashrightarrow 00{:}17{:}08.530$ positive for the biomarker.
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}08.530 \dashrightarrow 00{:}17{:}10.852$ So it seems a good setup like these are
- NOTE Confidence: 0.895463764667511
- $00:17:10.852 \rightarrow 00:17:13.298$ people who tested negative for other viruses,
- NOTE Confidence: 0.895463764667511
- $00:17:13.300 \longrightarrow 00:17:14.284$ 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
- $00:17:15.924 \rightarrow 00:17:17.600$ that a viral infection,
- NOTE Confidence: 0.895463764667511
- $00:17:17.600 \rightarrow 00:17:19.520$ their bodies fighting a viral infection.
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}19{.}520 \dashrightarrow 00{:}17{:}21{.}416$ So then we tested all these
- NOTE Confidence: 0.895463764667511
- $00:17:21.416 \longrightarrow 00:17:23.360$ people for with the PCR test,
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}23.360 \dashrightarrow 00{:}17{:}25.642$ and it turns out that among these
- NOTE Confidence: 0.895463764667511
- $00:17:25.642 \rightarrow 00:17:27.290$ biomarker positive people were four
- NOTE Confidence: 0.895463764667511
- $00:17:27.290 \rightarrow 00:17:29.439$ 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
- $00:17:31.645 \rightarrow 00:17:33.920$ infant that was seen as an outpatient,
- NOTE Confidence: 0.895463764667511
- $00:17:33.920 \longrightarrow 00:17:36.489$ that that that was a bit of

- NOTE Confidence: 0.895463764667511
- $00:17:36.489 \longrightarrow 00:17:38.580$ a surprise to find that.
- NOTE Confidence: 0.895463764667511
- 00:17:38.580 --> 00:17:39.300 And unfortunately,
- NOTE Confidence: 0.895463764667511
- $00:17:39.300 \longrightarrow 00:17:40.740$ being here at Yale,
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}40.740 \dashrightarrow 00{:}17{:}42.900$ we have so many great collaborators
- NOTE Confidence: 0.895463764667511
- $00:17:42.900 \longrightarrow 00:17:43.980$ with different expertise,
- NOTE Confidence: 0.895463764667511
- $00:17:43.980 \longrightarrow 00:17:46.108$ we were able to ask Nate Grubaugh
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}46.108 \dashrightarrow 00{:}17{:}48.747$ slab in the school of public health
- NOTE Confidence: 0.895463764667511
- $00:17:48.747 \longrightarrow 00:17:50.812$ to sequence those for isolates.
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}50.820 \dashrightarrow 00{:}17{:}53.095$ This was a paper earlier published by
- NOTE Confidence: 0.895463764667511
- $00:17:53.095 \rightarrow 00:17:55.118$ the group lab showing using sequencing
- NOTE Confidence: 0.895463764667511
- $00:17:55.118 \rightarrow 00:17:58.296$ of the virus that a lot of the early
- NOTE Confidence: 0.895463764667511
- $00{:}17{:}58.296 \dashrightarrow 00{:}18{:}00.371$ cases coming to Connecticut were
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}00{.}371 \dashrightarrow 00{:}18{:}02{.}340$ from transmission that were domestic
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}02{.}340 \dashrightarrow 00{:}18{:}04{.}860$ rather than international an the four cases.
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}04.860 \dashrightarrow 00{:}18{:}07.020$ I hope you can see this,
- NOTE Confidence: 0.895463764667511

- $00:18:07.020 \longrightarrow 00:18:08.830$ but the four cases that.
- NOTE Confidence: 0.895463764667511
- 00:18:08.830 --> 00:18:09.154 Uh,
- NOTE Confidence: 0.895463764667511
- $00:18:09.154 \rightarrow 00:18:11.746$ we had picked up in those early weeks.
- NOTE Confidence: 0.895463764667511
- $00:18:11.750 \longrightarrow 00:18:13.370$ Kind of fit this pattern.
- NOTE Confidence: 0.895463764667511
- $00:18:13.370 \longrightarrow 00:18:15.512$ Three of the case is shown
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}15{.}512 \dashrightarrow 00{:}18{:}17{.}859$ with the sort of red lines.
- NOTE Confidence: 0.895463764667511
- $00:18:17.860 \rightarrow 00:18:20.348$ They do a track most closely with North
- NOTE Confidence: 0.895463764667511
- $00:18:20.348 \rightarrow 00:18:22.146$ American other isolates from North
- NOTE Confidence: 0.895463764667511
- $00:18:22.146 \longrightarrow 00:18:24.372$ America as opposed to other countries.
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}24{.}380 \dashrightarrow 00{:}18{:}26{.}828$ And then there was one that tracked most
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}26.828 \dashrightarrow 00{:}18{:}29.180$ closest to strains from Western Europe.
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}29{.}180 \dashrightarrow 00{:}18{:}31{.}588$ So this kind of fit the pattern will
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}31{.}588 \dashrightarrow 00{:}18{:}33{.}978$ also is really interesting to me.
- NOTE Confidence: 0.895463764667511
- $00:18:33.980 \rightarrow 00:18:36.508$ Is that all these for patients that came
- NOTE Confidence: 0.895463764667511
- $00:18:36.508 \rightarrow 00:18:38.945$ within a couple of days the hospital
- NOTE Confidence: 0.895463764667511
- $00:18:38.945 \longrightarrow 00:18:41.106$ none of their viruses were directly

- NOTE Confidence: 0.895463764667511
- $00:18:41.106 \rightarrow 00:18:43.584$ related were the same as the other,
- NOTE Confidence: 0.895463764667511
- $00:18:43.590 \longrightarrow 00:18:44.958$ so this is independent
- NOTE Confidence: 0.895463764667511
- $00:18:44.958 \longrightarrow 00:18:45.984$ introductions coming in,
- NOTE Confidence: 0.895463764667511
- $00:18:45.990 \rightarrow 00:18:48.454$ which was also probably says something about
- NOTE Confidence: 0.895463764667511
- $00:18:48.454 \rightarrow 00:18:51.159$ travel back and forth and things like that.
- NOTE Confidence: 0.895463764667511
- $00{:}18{:}51{.}160 \dashrightarrow 00{:}18{:}52{.}972$ So that was quite an interesting
- NOTE Confidence: 0.895463764667511
- $00:18:52.972 \rightarrow 00:18:54.987$ bonus of being a in collaboration
- NOTE Confidence: 0.895463764667511
- $00:18:54.987 \longrightarrow 00:18:56.837$ with other folks at Yale.
- NOTE Confidence: 0.895463764667511
- $00:18:56.840 \longrightarrow 00:18:58.600$ To find more information
- NOTE Confidence: 0.895463764667511
- $00:18:58.600 \rightarrow 00:18:59.920$ about those patients.
- NOTE Confidence: 0.895463764667511
- 00:18:59.920 --> 00:19:00.256 Uhm,
- NOTE Confidence: 0.895463764667511
- $00:19:00.256 \rightarrow 00:19:03.740$ but we also had an idea just looking at this.
- NOTE Confidence: 0.895463764667511
- $00:19:03.740 \longrightarrow 00:19:05.124$ 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
- $00{:}19{:}06.860 \dashrightarrow 00{:}19{:}08.942$ you know 376 PCR test to
- NOTE Confidence: 0.895463764667511

 $00:19:08.942 \longrightarrow 00:19:10.330$ test all these patients.

NOTE Confidence: 0.895463764667511

 $00{:}19{:}10{.}330 \dashrightarrow 00{:}19{:}13{.}003$ But really if we had only tested the 33

NOTE Confidence: 0.895463764667511

 $00:19:13.003 \rightarrow 00:19:15.540$ that were positive for the biomarker,

NOTE Confidence: 0.895463764667511

 $00:19:15.540 \rightarrow 00:19:18.308$ we still would have found all the cases.

NOTE Confidence: 0.895463764667511

 $00{:}19{:}18{.}310 \dashrightarrow 00{:}19{:}20{.}122$ And so it suggested maybe this

NOTE Confidence: 0.895463764667511

 $00:19:20.122 \longrightarrow 00:19:22.130$ is a way of expanding,

NOTE Confidence: 0.895463764667511

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

NOTE Confidence: 0.895463764667511

 $00:19:22.958 \rightarrow 00:19:24.614$ 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

 $00:19:26.946 \rightarrow 00:19:28.466$ high suspicion to be positive

NOTE Confidence: 0.895463764667511

 $00:19:28.466 \longrightarrow 00:19:30.847$ and so we tried that so far just.

NOTE Confidence: 0.895463764667511

 $00:19:30.850 \longrightarrow 00:19:31.831$ 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

 $00:19:33.793 \longrightarrow 00:19:36.143$ where we were able to get all

NOTE Confidence: 0.895463764667511

 $00:19:36.143 \longrightarrow 00:19:37.447$ the residual samples from

NOTE Confidence: 0.881870329380035

 $00:19:37.523 \rightarrow 00:19:39.388$ testing went 144 patients were

 $00:19:39.388 \rightarrow 00:19:41.954$ tested that day for SARS, Co V2.

NOTE Confidence: 0.881870329380035

 $00{:}19{:}41{.}954 \dashrightarrow 00{:}19{:}44{.}730$ And did the biomarker test an what you

NOTE Confidence: 0.881870329380035

 $00{:}19{:}44{.}811 \dashrightarrow 00{:}19{:}47{.}899$ can see is again as a smaller proportion

NOTE Confidence: 0.881870329380035

 $00:19:47.899 \rightarrow 00:19:50.908$ of people were positive than negative.

NOTE Confidence: 0.881870329380035

 $00:19:50.910 \longrightarrow 00:19:53.339$ And then we compared this to the

NOTE Confidence: 0.881870329380035

 $00{:}19{:}53{.}339 \dashrightarrow 00{:}19{:}55{.}852$ results from the PCR testing and it

NOTE Confidence: 0.881870329380035

 $00:19:55.852 \rightarrow 00:19:58.357$ turned out that 17 people were PCR

NOTE Confidence: 0.881870329380035

 $00:19:58.357 \rightarrow 00:20:00.779$ 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

 $00:20:02.760 \rightarrow 00:20:03.750$ 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

 $00{:}20{:}05{.}822 \dashrightarrow 00{:}20{:}07{.}380$ have the biomarker expressed,

NOTE Confidence: 0.881870329380035

 $00:20:07.380 \longrightarrow 00:20:08.970$ and that patient also happened

NOTE Confidence: 0.881870329380035

 $00:20:08.970 \longrightarrow 00:20:11.340$ to have a very low viral load,

NOTE Confidence: 0.881870329380035

 $00:20:11.340 \longrightarrow 00:20:12.990$ which is kind of something

 $00:20:12.990 \longrightarrow 00:20:14.310$ we're following up on.

NOTE Confidence: 0.881870329380035

 $00:20:14.310 \longrightarrow 00:20:17.280$ So if we had had all 17 up here,

NOTE Confidence: 0.881870329380035

 $00:20:17.280 \longrightarrow 00:20:18.930$ we could have said are

NOTE Confidence: 0.881870329380035

 $00:20:18.930 \longrightarrow 00:20:19.920$ 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

 $00:20:21.900 \rightarrow 00:20:24.210$ you don't have the virus is 100%,

NOTE Confidence: 0.881870329380035

 $00:20:24.210 \longrightarrow 00:20:26.190$ but we can't say that we

NOTE Confidence: 0.881870329380035

 $00:20:26.190 \longrightarrow 00:20:28.340$ have to say 99% because of.

NOTE Confidence: 0.881870329380035

 $00{:}20{:}28{.}340 \dashrightarrow 00{:}20{:}31{.}660$ This this one patient out of out of

NOTE Confidence: 0.881870329380035

 $00{:}20{:}31.757 \dashrightarrow 00{:}20{:}35.117$ the 144 that were screened and tested.

NOTE Confidence: 0.881870329380035

 $00{:}20{:}35{.}120 \dashrightarrow 00{:}20{:}38{.}192$ Um, so we that got us interested in

NOTE Confidence: 0.881870329380035

 $00:20:38.192 \rightarrow 00:20:40.429$ biological variables and how they

NOTE Confidence: 0.881870329380035

 $00:20:40.429 \longrightarrow 00:20:42.759$ impact this biomarker that's induces

NOTE Confidence: 0.881870329380035

 $00{:}20{:}42.759 \dashrightarrow 00{:}20{:}45.185$ approaching that's induced by viral

NOTE Confidence: 0.881870329380035

 $00:20:45.185 \longrightarrow 00:20:47.077$ replication within the epithelial

NOTE Confidence: 0.881870329380035

 $00:20:47.077 \rightarrow 00:20:49.212$ cells and possibly infiltrating cells.

- NOTE Confidence: 0.881870329380035
- $00{:}20{:}49{.}212 \dashrightarrow 00{:}20{:}51{.}704$ 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
- $00:20:53.330 \longrightarrow 00:20:54.306$ which was 59 patients.
- NOTE Confidence: 0.881870329380035
- $00:20:54.306 \rightarrow 00:20:56.147$ 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
- $00:20:58.420 \rightarrow 00:21:01.250$ and if you look at the symptoms by age group,
- NOTE Confidence: 0.881870329380035
- $00:21:01.250 \longrightarrow 00:21:02.834$ 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
- $00{:}21{:}04{.}360 \dashrightarrow 00{:}21{:}06{.}446$ As you might expect much more likely
- NOTE Confidence: 0.881870329380035
- $00:21:06.446 \rightarrow 00:21:08.442$ 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
- $00{:}21{:}10.522 \dashrightarrow 00{:}21{:}12.227$ So what about the correlation
- NOTE Confidence: 0.881870329380035
- $00:21:12.227 \longrightarrow 00:21:13.250$ 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

 $00:21:15.301 \longrightarrow 00:21:17.347$ if you look at viral load

NOTE Confidence: 0.881870329380035

 $00{:}21{:}17{.}347 \dashrightarrow 00{:}21{:}18{.}370$ versus the biomarker,

NOTE Confidence: 0.881870329380035

 $00{:}21{:}18{.}370 \dashrightarrow 00{:}21{:}19{.}730$ 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

 $00{:}21{:}21{.}090 \dashrightarrow 00{:}21{:}22{.}550$ Because, as I mentioned,

NOTE Confidence: 0.881870329380035

 $00:21:22.550 \rightarrow 00:21:24.740$ 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

 $00{:}21{:}28.718 \dashrightarrow 00{:}21{:}30.050$ age versus the biomarker,

NOTE Confidence: 0.881870329380035

 $00{:}21{:}30{.}050 \dashrightarrow 00{:}21{:}31{.}526$ there's a negative correlation

NOTE Confidence: 0.881870329380035

 $00:21:31.526 \rightarrow 00:21:33.740$ where this biomarker is lower and

NOTE Confidence: 0.881870329380035

 $00:21:33.804 \longrightarrow 00:21:35.708$ the people with the older age is.

NOTE Confidence: 0.881870329380035

 $00{:}21{:}35{.}710 \dashrightarrow 00{:}21{:}38{.}090$ But there doesn't seem to be a

NOTE Confidence: 0.881870329380035

 $00{:}21{:}38.090 \dashrightarrow 00{:}21{:}39.492$ clear correlation between agent

NOTE Confidence: 0.881870329380035

 $00:21:39.492 \longrightarrow 00:21:41.370$ viral load in this same group,

- NOTE Confidence: 0.881870329380035
- $00:21:41.370 \longrightarrow 00:21:43.040$ so we're still investigating this.
- NOTE Confidence: 0.881870329380035
- $00:21:43.040 \longrightarrow 00:21:45.175$ So we actually struck up a collaboration
- NOTE Confidence: 0.881870329380035
- $00:21:45.175 \rightarrow 00:21:46.700$ 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
- $00{:}21{:}48.695 \dashrightarrow 00{:}21{:}51.069$ Pediatrics to delve into this further
- NOTE Confidence: 0.881870329380035
- $00:21:51.069 \rightarrow 00:21:53.549$ and see if we can figure out what's
- NOTE Confidence: 0.881870329380035
- $00:21:53.549 \rightarrow 00:21:55.766$ 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
- $00:22:00.070 \longrightarrow 00:22:02.700$ what's ahead for this project?
- NOTE Confidence: 0.881870329380035
- $00{:}22{:}02{.}700 \dashrightarrow 00{:}22{:}04{.}470$ I mentioned from these headlines
- NOTE Confidence: 0.881870329380035
- $00:22:04.470 \rightarrow 00:22:06.900$ 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
- $00:22:08.400 \rightarrow 00:22:11.010$ 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
- $00:22:12.991 \rightarrow 00:22:14.977$ persistent PCR positive but not infectious.
- NOTE Confidence: 0.881870329380035

 $00:22:14.980 \rightarrow 00:22:16.978$ Anna question everyone always asked me.

NOTE Confidence: 0.881870329380035

 $00{:}22{:}16{.}980 \dashrightarrow 00{:}22{:}18{.}966$ I'm just going to preempt it.

NOTE Confidence: 0.881870329380035

 $00:22:18.970 \longrightarrow 00:22:21.426$ It would be great to know what this

NOTE Confidence: 0.881870329380035

 $00:22:21.426 \rightarrow 00:22:23.948$ this type of biomarker an in general,

NOTE Confidence: 0.881870329380035

 $00:22:23.950 \rightarrow 00:22:25.936$ what the host response to infection,

NOTE Confidence: 0.881870329380035

 $00:22:25.940 \longrightarrow 00:22:28.022$ how it's changing overtime during the NOTE Confidence: 0.881870329380035

 $00:22:28.022 \rightarrow 00:22:30.590$ course of what can be a long illness.

NOTE Confidence: 0.881870329380035

 $00:22:30.590 \rightarrow 00:22:33.257$ And so we're actively looking at that

NOTE Confidence: 0.881870329380035

 $00{:}22{:}33{.}257 \dashrightarrow 00{:}22{:}36{.}006$ 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

 $00:22:40.376 \longrightarrow 00:22:42.980$ on a lab before the pandemic hit.

NOTE Confidence: 0.898455262184143

 $00:22:42.980 \longrightarrow 00:22:44.051$ 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

 $00:22:46.618 \longrightarrow 00:22:48.574$ to find the next pandemic virus

NOTE Confidence: 0.898455262184143

 $00:22:48.574 \rightarrow 00:22:50.820$ before it hits using this strategy.

 $00:22:50.820 \rightarrow 00:22:52.860$ 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

 $00{:}22{:}55{.}334 \dashrightarrow 00{:}22{:}57{.}069$ Health Masters student who is

NOTE Confidence: 0.898455262184143

 $00:22:57.069 \rightarrow 00:22:59.568$ in my lab but graduated in 2019.

NOTE Confidence: 0.898455262184143

 $00{:}22{:}59{.}570 \dashrightarrow 00{:}23{:}01{.}754$ And our idea there was the same

NOTE Confidence: 0.898455262184143

 $00:23:01.754 \longrightarrow 00:23:04.515$ idea of let's look at people who

NOTE Confidence: 0.898455262184143

 $00{:}23{:}04{.}515 \dashrightarrow 00{:}23{:}06{.}263$ their doctors suspected viral

NOTE Confidence: 0.898455262184143

 $00:23:06.263 \longrightarrow 00:23:07.839$ infection sent the test.

NOTE Confidence: 0.898455262184143

 $00{:}23{:}07{.}840 \dashrightarrow 00{:}23{:}09{.}586$ 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

 $00:23:11.750 \rightarrow 00:23:13.531$ can find people who who looks like

NOTE Confidence: 0.898455262184143

 $00{:}23{:}13{.}531 \dashrightarrow 00{:}23{:}15{.}373$ their body was fighting a viral

NOTE Confidence: 0.898455262184143

 $00{:}23{:}15{.}373 \dashrightarrow 00{:}23{:}17{.}071$ infection and may be 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

 $00{:}23{:}18.613 \dashrightarrow 00{:}23{:}20.726$ of so we can find out what other

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

NOTE Confidence: 0.898455262184143

 $00{:}23{:}22.195 \dashrightarrow 00{:}23{:}23.795$ our patient population that were

NOTE Confidence: 0.898455262184143

 $00:23:23.795 \longrightarrow 00:23:25.570$ 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

 $00:23:31.460 \longrightarrow 00:23:33.992$ One negative samples with our biomarker

NOTE Confidence: 0.898455262184143

 $00:23:33.992 \longrightarrow 00:23:36.319$ that we talked about here CL.

NOTE Confidence: 0.898455262184143

 $00{:}23{:}36{.}320 \dashrightarrow 00{:}23{:}39{.}434$ 10 and she had 60 of them that were

NOTE Confidence: 0.898455262184143

 $00:23:39.434 \longrightarrow 00:23:42.206$ had high levels of the biomarker

NOTE Confidence: 0.898455262184143

 $00:23:42.206 \longrightarrow 00:23:43.604$ at that time.

NOTE Confidence: 0.898455262184143

 $00:23:43.610 \longrightarrow 00:23:45.848$ We were not doing testing for

NOTE Confidence: 0.898455262184143

 $00{:}23{:}45{.}848 \dashrightarrow 00{:}23{:}47{.}340$ the seasonal coronaviruses or

NOTE Confidence: 0.898455262184143

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

NOTE Confidence: 0.898455262184143

 $00{:}23{:}48.870 \dashrightarrow 00{:}23{:}52.515$ 4 so she did that testing an interesting Lee.

NOTE Confidence: 0.898455262184143

 $00:23:52.520 \longrightarrow 00:23:54.650$ Half of these patients had

NOTE Confidence: 0.898455262184143

 $00{:}23{:}54.650 \dashrightarrow 00{:}23{:}55.928$ seasonal coronaviruses and

 $00:23:55.928 \rightarrow 00:23:57.800$ that actually tipped our hat.

NOTE Confidence: 0.898455262184143

 $00{:}23{:}57{.}800 \dashrightarrow 00{:}23{:}59{.}468$ Let us know that seasonal Corona

NOTE Confidence: 0.898455262184143

 $00:23:59.468 \rightarrow 00:24:01.216$ 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

 $00:24:02.676 \rightarrow 00:24:04.876$ has now added that to the clinical panel.

NOTE Confidence: 0.898455262184143

 $00:24:04.880 \longrightarrow 00:24:06.488$ 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

 $00{:}24{:}07{.}990 \dashrightarrow 00{:}24{:}10{.}014$ but this also as a proof of concept

NOTE Confidence: 0.898455262184143

 $00{:}24{:}10.014 \dashrightarrow 00{:}24{:}12.308$ that our strategy works of picking up

NOTE Confidence: 0.898455262184143

 $00:24:12.308 \rightarrow 00:24:14.790$ 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

 $00{:}24{:}15{.}340 \dashrightarrow 00{:}24{:}16{.}990$ we also have half the samples

NOTE Confidence: 0.898455262184143

 $00:24:16.990 \longrightarrow 00:24:17.930$ 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

 $00{:}24{:}19{.}415 \dashrightarrow 00{:}24{:}21{.}350$ well for some of them we do,

 $00:24:21.350 \rightarrow 00:24:23.888$ but many of them we don't know what what

NOTE Confidence: 0.898455262184143

 $00{:}24{:}23.888 \dashrightarrow 00{:}24{:}25.619$ infectious agents are in the sample,

NOTE Confidence: 0.898455262184143

 $00:24:25.620 \rightarrow 00:24:27.330$ and we're working that up and

NOTE Confidence: 0.898455262184143

 $00:24:27.330 \rightarrow 00:24:28.470$ finding some interesting things,

NOTE Confidence: 0.898455262184143

 $00:24:28.470 \rightarrow 00:24:31.035$ and we hope this will be a good strategy.

NOTE Confidence: 0.898455262184143

 $00:24:31.040 \rightarrow 00:24:33.280$ Going forward to get an even more

NOTE Confidence: 0.898455262184143

 $00:24:33.280 \rightarrow 00:24:34.929$ comprehensive view of the viruses

NOTE Confidence: 0.898455262184143

 $00:24:34.929 \rightarrow 00:24:37.127$ 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

 $00:24:39.188 \rightarrow 00:24:40.873$ 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

 $00:24:43.501 \rightarrow 00:24:45.907$ we're interested in studying the host

NOTE Confidence: 0.898455262184143

 $00{:}24{:}45{.}907 \dashrightarrow 00{:}24{:}48{.}409$ response to fight coronavirus today.

NOTE Confidence: 0.898455262184143

 $00:24:48.410 \longrightarrow 00:24:50.700$ I talked about diagnostic applications

NOTE Confidence: 0.898455262184143

 $00:24:50.700 \rightarrow 00:24:53.579$ were also really interested in getting

- NOTE Confidence: 0.898455262184143
- $00:24:53.579 \rightarrow 00:24:56.179$ insights into early stage pathogenesis.
- NOTE Confidence: 0.898455262184143
- $00:24:56.180 \rightarrow 00:24:58.436$ And how this differs among people
- NOTE Confidence: 0.898455262184143
- $00{:}24{:}58{.}436 \dashrightarrow 00{:}24{:}59{.}940$ who have different outcomes.
- NOTE Confidence: 0.898455262184143
- 00:24:59.940 --> 00:25:00.328 Uhm,
- NOTE Confidence: 0.898455262184143
- $00{:}25{:}00{.}328 \dashrightarrow 00{:}25{:}03{.}044$ I talked about a host response based
- NOTE Confidence: 0.898455262184143
- $00:25:03.044 \rightarrow 00:25:05.759$ screening test that we've been working on,
- NOTE Confidence: 0.898455262184143
- $00:25:05.760 \longrightarrow 00:25:08.310$ which allowed us to identify for
- NOTE Confidence: 0.898455262184143
- $00:25:08.310 \longrightarrow 00:25:10.450$ undiagnosed cases from early March
- NOTE Confidence: 0.898455262184143
- $00:25:10.450 \rightarrow 00:25:12.664$ and we're looking at other utilities
- NOTE Confidence: 0.898455262184143
- $00:25:12.664 \rightarrow 00:25:15.620$ to sort of fill in the gaps in
- NOTE Confidence: 0.898455262184143
- $00:25:15.620 \rightarrow 00:25:17.395$ some of our testing strategies,
- NOTE Confidence: 0.898455262184143
- $00{:}25{:}17{.}400 \dashrightarrow 00{:}25{:}19{.}596$ 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
- $00:25:25.620 \rightarrow 00:25:27.560$ 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

 $00{:}25{:}31.040 \dashrightarrow 00{:}25{:}33.356$ 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

 $00{:}25{:}36{.}454 \dashrightarrow 00{:}25{:}38{.}776$ have been done in a silo.

NOTE Confidence: 0.896027147769928

 $00:25:38.780 \longrightarrow 00:25:41.587$ It was very great to have lots

NOTE Confidence: 0.896027147769928

 $00:25:41.587 \longrightarrow 00:25:43.839$ of collaborators an it still is.

NOTE Confidence: 0.896027147769928

 $00:25:43.840 \rightarrow 00:25:46.290$ I want to acknowledge my my lab

NOTE Confidence: 0.896027147769928

 $00:25:46.290 \rightarrow 00:25:47.980$ members including ready tomorrow.

NOTE Confidence: 0.896027147769928

 $00{:}25{:}47{.}980 \dashrightarrow 00{:}25{:}50{.}230$ I mentioned who spearheaded the project.

NOTE Confidence: 0.896027147769928

 $00{:}25{:}50{.}230 \dashrightarrow 00{:}25{:}52{.}491$ I talked about as well as Marie

NOTE Confidence: 0.896027147769928

 $00{:}25{:}52{.}491 \dashrightarrow 00{:}25{:}55{.}119$ Landry on the clinical virology lab,

NOTE Confidence: 0.896027147769928

 $00{:}25{:}55{.}120 \dashrightarrow 00{:}25{:}57{.}376$ especially Marino in and Robin Garner,

NOTE Confidence: 0.896027147769928

 $00:25:57.380 \longrightarrow 00:25:59.260$ 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

 $00:26:01.135 \longrightarrow 00:26:02.260$ with our bioinformatics,

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

NOTE Confidence: 0.896027147769928

 $00:26:04.900 \rightarrow 00:26:08.275$ 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

 $00:26:11.104 \rightarrow 00:26:12.692$ constant participation and help

NOTE Confidence: 0.896027147769928

 $00{:}26{:}12.692 \dashrightarrow 00{:}26{:}14.328$ with the molecular Epidemiology.

NOTE Confidence: 0.896027147769928

 $00{:}26{:}14.330 \dashrightarrow 00{:}26{:}17.146$ As well as lab working group depicted here

NOTE Confidence: 0.896027147769928

 $00{:}26{:}17.146 \dashrightarrow 00{:}26{:}20.108$ 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

 $00:26:22.800 \longrightarrow 00:26:24.075$ 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

 $00:26:27.135 \longrightarrow 00:26:29.685$ 45,000 global cases on March 2nd.

NOTE Confidence: 0.896027147769928

 $00:26:29.690 \longrightarrow 00:26:30.762$ Uh, so with that?

NOTE Confidence: 0.896027147769928

 $00:26:30.762 \longrightarrow 00:26:32.906$ 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

 $00:26:34.780 \rightarrow 00:26:36.388$ but hopefully you're able to follow.

 $00:26:36.390 \longrightarrow 00:26:38.208$ And if there's any questions I

NOTE Confidence: 0.896027147769928

 $00:26:38.208 \longrightarrow 00:26:40.499$ 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

 $00{:}26{:}41{.}150 \dashrightarrow 00{:}26{:}43{.}112$ Ellen. Thank you and congratulations to

NOTE Confidence: 0.932004988193512

 $00{:}26{:}43.112 \dashrightarrow 00{:}26{:}45.616$ you and your entire research group on that

NOTE Confidence: 0.932004988193512

 $00:26:45.616 \rightarrow 00:26:47.739$ impressive body of work in a relatively

NOTE Confidence: 0.932004988193512

 $00{:}26{:}47.739 \dashrightarrow 00{:}26{:}49.929$ short time to address the pandemic.

NOTE Confidence: 0.932004988193512

 $00:26:49.930 \longrightarrow 00:26:51.898$ and I know we're just about

NOTE Confidence: 0.932004988193512

 $00{:}26{:}51.898 \dashrightarrow 00{:}26{:}54.148$ the top of the hour or so,

NOTE Confidence: 0.932004988193512

 $00{:}26{:}54{.}150 \dashrightarrow 00{:}26{:}56{.}100$ and if folks can submit questions,

NOTE Confidence: 0.932004988193512

 $00{:}26{:}56{.}100 \dashrightarrow 00{:}26{:}58{.}700$ but let me just offer up a couple.

NOTE Confidence: 0.932004988193512

 $00:26:58.700 \longrightarrow 00:26:59.678$ 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

 $00:27:01.848 \longrightarrow 00:27:04.116$ on sort of the biomarkers is really

NOTE Confidence: 0.932004988193512

 $00:27:04.116 \rightarrow 00:27:06.498$ interesting in terms of testing strategy,

NOTE Confidence: 0.932004988193512

 $00:27:06.500 \longrightarrow 00:27:08.125$ 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
- $00:27:09.750 \longrightarrow 00:27:11.634$ which was, how does it change
- NOTE Confidence: 0.932004988193512
- $00:27:11.634 \rightarrow 00:27:13.749$ 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
- $00{:}27{:}14.647 \dashrightarrow 00{:}27{:}17.153$ do we have a sense of biomarkers that
- NOTE Confidence: 0.932004988193512
- $00:27:17.153 \rightarrow 00:27:19.241$ might predict the severity of illness
- NOTE Confidence: 0.932004988193512
- $00{:}27{:}19{.}241 \dashrightarrow 00{:}27{:}21{.}375$ that is almost to predict who's
- NOTE Confidence: 0.932004988193512
- $00:27:21.375 \longrightarrow 00:27:23.427$ more likely to need more intensive
- NOTE Confidence: 0.932004988193512
- $00:27:23.427 \rightarrow 00:27:25.440$ care at the time of diagnosis?
- NOTE Confidence: 0.932838261127472
- $00:27:26.140 \longrightarrow 00:27:28.336$ 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
- $00{:}27{:}30{.}804 \dashrightarrow 00{:}27{:}33{.}360$ about blood like cytokines in the blood
- NOTE Confidence: 0.932838261127472
- $00{:}27{:}33{.}360 \dashrightarrow 00{:}27{:}35{.}150$ that could be indicated indicative
- NOTE Confidence: 0.932838261127472
- $00{:}27{:}35{.}150 \dashrightarrow 00{:}27{:}37{.}486$ of that we're looking even earlier.
- NOTE Confidence: 0.932838261127472
- $00:27:37.490 \longrightarrow 00:27:40.289$ I mean it at the at the early stage
- NOTE Confidence: 0.932838261127472

 $00:27:40.289 \longrightarrow 00:27:42.234$ 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

 $00:27:44.406 \rightarrow 00:27:46.278$ really interested in this potential

NOTE Confidence: 0.932838261127472

 $00{:}27{:}46{.}278 \dashrightarrow 00{:}27{:}48{.}093$ difference between a dults and kids.

NOTE Confidence: 0.932838261127472

00:27:48.100 --> 00:27:49.186 Because, you know,

NOTE Confidence: 0.932838261127472

 $00{:}27{:}49{.}186 \dashrightarrow 00{:}27{:}51{.}358$ kids are seem relatively protected from

NOTE Confidence: 0.932838261127472

 $00:27:51.358 \rightarrow 00:27:53.220$ pulmonary disease compared to adults,

NOTE Confidence: 0.932838261127472

 $00:27:53.220 \longrightarrow 00:27:53.850$ older adults.

NOTE Confidence: 0.932838261127472

 $00:27:53.850 \longrightarrow 00:27:55.740$ So that's one reason why we

NOTE Confidence: 0.932838261127472

 $00:27:55.740 \longrightarrow 00:27:57.727$ struck up this collaboration with

NOTE Confidence: 0.932838261127472

 $00{:}27{:}57{.}727 \dashrightarrow 00{:}27{:}59{.}887$ Pediatrics to try to understand.

NOTE Confidence: 0.932838261127472

 $00{:}27{:}59{.}890 \dashrightarrow 00{:}28{:}02{.}046$ Is there some difference in the robustness

NOTE Confidence: 0.932838261127472

 $00:28:02.046 \longrightarrow 00:28:04.350$ of that initial response that could you

NOTE Confidence: 0.932838261127472

 $00:28:04.350 \rightarrow 00:28:06.330$ know that could possibly explain this?

NOTE Confidence: 0.932838261127472

 $00:28:06.330 \longrightarrow 00:28:07.293$ There's many explanations,

NOTE Confidence: 0.932838261127472

 $00{:}28{:}07{.}293 \dashrightarrow 00{:}28{:}08{.}256$ but that's one,

 $00:28:08.260 \rightarrow 00:28:10.339$ 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

 $00:28:12.450 \longrightarrow 00:28:14.697$ but I don't have the answer yet.

NOTE Confidence: 0.932838261127472

 $00:28:14.700 \rightarrow 00:28:17.902$ This is it's very rare to give a talk on a

NOTE Confidence: 0.932838261127472

 $00:28:17.902 \rightarrow 00:28:20.499$ project that started like two months ago,

NOTE Confidence: 0.932838261127472

 $00:28:20.500 \longrightarrow 00:28:22.796$ but so that's why there's a more

NOTE Confidence: 0.932838261127472

 $00:28:22.796 \rightarrow 00:28:24.678$ questions than answers at this point,

NOTE Confidence: 0.932838261127472

 $00:28:24.680 \longrightarrow 00:28:26.934$ but we hope to find that out.

NOTE Confidence: 0.932838261127472

 $00:28:26.940 \longrightarrow 00:28:28.550$ We're looking at the whole.

NOTE Confidence: 0.932838261127472

 $00:28:28.550 \rightarrow 00:28:30.536$ The entire pattern of gene expression.

NOTE Confidence: 0.932838261127472

 $00:28:30.540 \rightarrow 00:28:33.177$ Um and not just this one biomarker to try

NOTE Confidence: 0.932838261127472

 $00:28:33.177 \rightarrow 00:28:35.973$ to get it that in some specific groups

NOTE Confidence: 0.932838261127472

 $00:28:35.973 \rightarrow 00:28:38.350$ of patients with different outcomes.

NOTE Confidence: 0.908663034439087

 $00{:}28{:}38{.}940 \dashrightarrow 00{:}28{:}41{.}604$ So you know just to follow up on that.

NOTE Confidence: 0.908663034439087

 $00:28:41.610 \longrightarrow 00:28:43.991$ So do we think that, uh, I mean,

 $00:28:43.991 \rightarrow 00:28:45.179$ likely the airway response.

NOTE Confidence: 0.908663034439087

 $00{:}28{:}45{.}180 \dashrightarrow 00{:}28{:}46{.}665$ 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

 $00:28:48.150 \rightarrow 00:28:49.630$ The airway response is likely

NOTE Confidence: 0.908663034439087

 $00:28:49.630 \longrightarrow 00:28:50.814$ very different across ages.

NOTE Confidence: 0.908663034439087

 $00:28:50.820 \longrightarrow 00:28:52.731$ And you think that could be one

NOTE Confidence: 0.908663034439087

 $00:28:52.731 \rightarrow 00:28:54.715$ of the major explanations why age

NOTE Confidence: 0.908663034439087

 $00:28:54.715 \longrightarrow 00:28:56.911$ 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

 $00:28:58.710 \longrightarrow 00:29:00.612$ possibly, I'd like to have the

NOTE Confidence: 0.879945635795593

 $00:29:00.612 \longrightarrow 00:29:02.790$ data to answer you definitively,

NOTE Confidence: 0.879945635795593

 $00:29:02.790 \longrightarrow 00:29:04.278$ so hopefully will have

NOTE Confidence: 0.879945635795593

 $00:29:04.280 \longrightarrow 00:29:05.768$ that soon. Yeah, well,

NOTE Confidence: 0.879945635795593

 $00:29:05.768 \longrightarrow 00:29:08.000$ it sounds like more to follow.

NOTE Confidence: 0.879945635795593

 $00:29:08.000 \rightarrow 00:29:10.345$ Well, channel and for two really superb

NOTE Confidence: 0.879945635795593

 $00:29:10.345 \longrightarrow 00:29:12.560$ 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
- $00{:}29{:}17.554 \dashrightarrow 00{:}29{:}20.570$ online as we as the labs reopened but.
- NOTE Confidence: 0.879945635795593
- $00{:}29{:}20.570 \dashrightarrow 00{:}29{:}22.397$ Enjoy the rest of your day and
- NOTE Confidence: 0.879945635795593
- $00:29:22.397 \longrightarrow 00:29:23.936$ thank you all for your work.
- NOTE Confidence: 0.879945635795593
- $00{:}29{:}23{.}936 \dashrightarrow 00{:}29{:}24{.}970$ Thank you very much.