

WEBVTT

NOTE duration:"00:18:51"

NOTE recognizability:0.899

NOTE language:en-us

NOTE Confidence: 0.909446554615385

00:00:32.200 --> 00:00:34.258 Hi, Akiko. So there were a lot

NOTE Confidence: 0.909446554615385

00:00:34.258 --> 00:00:36.329 of questions and we I think you

NOTE Confidence: 0.909446554615385

00:00:36.329 --> 00:00:38.470 have been able to answer about 10

NOTE Confidence: 0.909446554615385

00:00:38.470 --> 00:00:40.400 questions earlier during the talk.

NOTE Confidence: 0.909446554615385

00:00:40.400 --> 00:00:42.720 I will be asking you a few more

NOTE Confidence: 0.909446554615385

00:00:42.720 --> 00:00:44.401 questions that had been shared

NOTE Confidence: 0.909446554615385

00:00:44.401 --> 00:00:46.477 by many of the viewers and

NOTE Confidence: 0.909446554615385

00:00:46.477 --> 00:00:48.277 participants from the LISTEN study.

NOTE Confidence: 0.909446554615385

00:00:48.280 --> 00:00:50.146 So the first question that I

NOTE Confidence: 0.909446554615385

00:00:50.146 --> 00:00:53.824 have today is so not finding auto

NOTE Confidence: 0.909446554615385

00:00:53.824 --> 00:00:55.952 antibodies especially means that

NOTE Confidence: 0.909446554615385

00:00:55.952 --> 00:00:58.208 it appears as the long COVID

NOTE Confidence: 0.909446554615385

00:00:58.208 --> 00:01:00.839 is not an autoimmune disease.

NOTE Confidence: 0.909446554615385

00:01:00.840 --> 00:01:02.840 Are long haulers considered
NOTE Confidence: 0.909446554615385

00:01:02.840 --> 00:01:03.840 immune compromised?
NOTE Confidence: 0.962230569090909

00:01:05.640 --> 00:01:08.016 Yeah. So let me be clear
NOTE Confidence: 0.962230569090909

00:01:08.016 --> 00:01:10.200 about what we actually found.
NOTE Confidence: 0.962230569090909

00:01:10.200 --> 00:01:13.800 We found using the rapid Excel
NOTE Confidence: 0.962230569090909

00:01:13.800 --> 00:01:16.200 antigen profiling developed by
NOTE Confidence: 0.962230569090909

00:01:16.305 --> 00:01:19.542 Doctor Rings lab that auto antibodies
NOTE Confidence: 0.962230569090909

00:01:19.542 --> 00:01:21.204 against extracellular proteins
NOTE Confidence: 0.962230569090909

00:01:21.204 --> 00:01:24.000 or secreted proteins from humans.
NOTE Confidence: 0.962230569090909

00:01:24.000 --> 00:01:26.400 We're not enriched in long COVID
NOTE Confidence: 0.962230569090909

00:01:26.400 --> 00:01:28.896 so we haven't specifically started
NOTE Confidence: 0.962230569090909

00:01:28.896 --> 00:01:31.516 to look at intracellular antigens.
NOTE Confidence: 0.962230569090909

00:01:31.520 --> 00:01:34.640 However, as you have done Bornelli,
NOTE Confidence: 0.962230569090909

00:01:34.640 --> 00:01:37.106 we have also unpublished data that
NOTE Confidence: 0.962230569090909

00:01:37.106 --> 00:01:39.219 demonstrate that there really isn't
NOTE Confidence: 0.962230569090909

00:01:39.219 --> 00:01:41.239 a striking difference in Lupus

NOTE Confidence: 0.962230569090909
00:01:41.239 --> 00:01:43.515 related auto antibodies at the time
NOTE Confidence: 0.962230569090909
00:01:43.515 --> 00:01:45.580 point that we are looking at which
NOTE Confidence: 0.962230569090909
00:01:45.580 --> 00:01:48.436 is well over a year after infection.
NOTE Confidence: 0.962230569090909
00:01:48.440 --> 00:01:51.104 So this means that it it doesn't look
NOTE Confidence: 0.962230569090909
00:01:51.104 --> 00:01:54.360 like a typical autoimmune disease to us.
NOTE Confidence: 0.962230569090909
00:01:54.360 --> 00:01:56.440 It may have, for instance,
NOTE Confidence: 0.962230569090909
00:01:56.440 --> 00:01:57.960 of involvement of T cells which
NOTE Confidence: 0.962230569090909
00:01:57.960 --> 00:01:59.565 we have not examined yet.
NOTE Confidence: 0.962230569090909
00:01:59.565 --> 00:02:03.376 So I don't want to rule out T cell
NOTE Confidence: 0.962230569090909
00:02:03.376 --> 00:02:06.116 mediated autoimmunity as a possibility.
NOTE Confidence: 0.962230569090909
00:02:06.120 --> 00:02:07.760 However, we we are not,
NOTE Confidence: 0.962230569090909
00:02:07.760 --> 00:02:10.606 we don't have any concrete evidence that
NOTE Confidence: 0.962230569090909
00:02:10.606 --> 00:02:13.236 supports autoimmunity at this point.
NOTE Confidence: 0.962230569090909
00:02:13.240 --> 00:02:14.505 It is possible though,
NOTE Confidence: 0.962230569090909
00:02:14.505 --> 00:02:16.920 that down the road years from now,
NOTE Confidence: 0.962230569090909

00:02:16.920 --> 00:02:19.944 some people may have an increased
NOTE Confidence: 0.962230569090909

00:02:19.944 --> 00:02:21.960 risk of developing autoimmunity,
NOTE Confidence: 0.962230569090909

00:02:21.960 --> 00:02:24.138 just like what's been shown for
NOTE Confidence: 0.962230569090909

00:02:24.138 --> 00:02:25.920 a multiple sclerosis in EBV.
NOTE Confidence: 0.962230569090909

00:02:25.920 --> 00:02:28.920 So I don't want to rule out a
NOTE Confidence: 0.962230569090909

00:02:28.920 --> 00:02:30.040 link in the future,
NOTE Confidence: 0.962230569090909

00:02:30.040 --> 00:02:32.062 but currently we're not really seeing
NOTE Confidence: 0.962230569090909

00:02:32.062 --> 00:02:35.840 a very strong signal for autoimmunity.
NOTE Confidence: 0.962230569090909

00:02:35.840 --> 00:02:36.160 OK,
NOTE Confidence: 0.906867867142857

00:02:36.200 --> 00:02:37.915 I'll move on to the next question.
NOTE Confidence: 0.906867867142857

00:02:37.920 --> 00:02:40.160 The next question is, will those of
NOTE Confidence: 0.906867867142857

00:02:40.160 --> 00:02:42.856 us with PEG allergy be able to use
NOTE Confidence: 0.906867867142857

00:02:42.856 --> 00:02:45.280 the nasal vaccine you have developed?
NOTE Confidence: 0.910101075454545

00:02:46.240 --> 00:02:49.102 Oh, right. So the nasal vaccine
NOTE Confidence: 0.910101075454545

00:02:49.102 --> 00:02:52.024 we have developed is a booster
NOTE Confidence: 0.910101075454545

00:02:52.024 --> 00:02:54.496 nasal booster strategy.

NOTE Confidence: 0.910101075454545
00:02:54.496 --> 00:02:58.582 So how it works is we leverage the
NOTE Confidence: 0.910101075454545
00:02:58.582 --> 00:03:00.556 existing immune responses developed
NOTE Confidence: 0.910101075454545
00:03:00.556 --> 00:03:04.010 by the mRNA vaccines and by
NOTE Confidence: 0.910101075454545
00:03:04.010 --> 00:03:06.990 inoculating spraying the recombinant
NOTE Confidence: 0.910101075454545
00:03:06.990 --> 00:03:10.744 spike protein into the nose and
NOTE Confidence: 0.910101075454545
00:03:10.744 --> 00:03:13.096 that establishes robust antibody
NOTE Confidence: 0.910101075454545
00:03:13.096 --> 00:03:16.222 anti cell immunity in the nose,
NOTE Confidence: 0.910101075454545
00:03:16.222 --> 00:03:19.184 throat and the lung of these animals.
NOTE Confidence: 0.910101075454545
00:03:19.184 --> 00:03:21.632 It's it's only preclinical right now.
NOTE Confidence: 0.910101075454545
00:03:21.640 --> 00:03:23.629 We are trying to raise funds to be able
NOTE Confidence: 0.910101075454545
00:03:23.629 --> 00:03:25.596 to do this in human clinical trial.
NOTE Confidence: 0.910101075454545
00:03:25.600 --> 00:03:27.040 We haven't done that yet.
NOTE Confidence: 0.910101075454545
00:03:27.040 --> 00:03:28.960 However, when it becomes available,
NOTE Confidence: 0.910101075454545
00:03:28.960 --> 00:03:31.680 I don't think there is any problem with
NOTE Confidence: 0.910101075454545
00:03:31.680 --> 00:03:34.608 people with PEG allergy because the
NOTE Confidence: 0.910101075454545

00:03:34.608 --> 00:03:37.120 recombinant spike protein contains no PEG.

NOTE Confidence: 0.910101075454545

00:03:37.120 --> 00:03:39.880 It's just a simple purified protein,

NOTE Confidence: 0.910101075454545

00:03:39.880 --> 00:03:42.200 no other events, no formulations.

NOTE Confidence: 0.910101075454545

00:03:42.200 --> 00:03:45.260 So I think that that would be a safe

NOTE Confidence: 0.910101075454545

00:03:45.260 --> 00:03:48.519 thing to use for people with PEG allergy.

NOTE Confidence: 0.910101075454545

00:03:48.520 --> 00:03:48.800 OK.

NOTE Confidence: 0.962986715714286

00:03:48.800 --> 00:03:51.796 The next question is related to cortisol.

NOTE Confidence: 0.962986715714286

00:03:51.800 --> 00:03:54.110 So people are asking what is

NOTE Confidence: 0.962986715714286

00:03:54.110 --> 00:03:56.080 happening with ACTH levels then,

NOTE Confidence: 0.931700895833333

00:03:57.360 --> 00:03:59.742 right? So our data show that

NOTE Confidence: 0.931700895833333

00:03:59.742 --> 00:04:01.777 even though the cortisol level

NOTE Confidence: 0.931700895833333

00:04:01.777 --> 00:04:04.346 is about half of that of healthy

NOTE Confidence: 0.931700895833333

00:04:04.346 --> 00:04:06.960 control in the long COVID patients,

NOTE Confidence: 0.931700895833333

00:04:06.960 --> 00:04:10.880 the ACTH which is a hormone secreted by

NOTE Confidence: 0.931700895833333

00:04:10.880 --> 00:04:13.998 the pituitary gland is not elevated,

NOTE Confidence: 0.931700895833333

00:04:14.000 --> 00:04:16.664 meaning that normally a low level

NOTE Confidence: 0.931700895833333
00:04:16.664 --> 00:04:19.630 of cortisol should be countered by
NOTE Confidence: 0.931700895833333
00:04:19.630 --> 00:04:22.318 increasing ACTH level to elevate the
NOTE Confidence: 0.931700895833333
00:04:22.318 --> 00:04:24.394 cortisol level from the adrenal gland.
NOTE Confidence: 0.931700895833333
00:04:24.400 --> 00:04:26.395 And that is not what we're seeing.
NOTE Confidence: 0.931700895833333
00:04:26.400 --> 00:04:28.829 And so we suspect that there might
NOTE Confidence: 0.931700895833333
00:04:28.829 --> 00:04:31.487 be defect within the pituitary or the
NOTE Confidence: 0.931700895833333
00:04:31.487 --> 00:04:33.809 hypothalamus which kind of tells the
NOTE Confidence: 0.931700895833333
00:04:33.886 --> 00:04:36.196 pituitary glands to make the ACTH.
NOTE Confidence: 0.931700895833333
00:04:36.200 --> 00:04:39.294 Maybe these central Oxy's are not working
NOTE Confidence: 0.931700895833333
00:04:39.294 --> 00:04:42.279 properly in the long COVID patients.
NOTE Confidence: 0.931700895833333
00:04:42.280 --> 00:04:45.208 So what Doctor Petrino's group is
NOTE Confidence: 0.931700895833333
00:04:45.208 --> 00:04:48.920 doing is to look at MRI from these
NOTE Confidence: 0.931700895833333
00:04:48.920 --> 00:04:51.272 Mylon COVID participants to see if
NOTE Confidence: 0.931700895833333
00:04:51.272 --> 00:04:53.946 there's any defect that they can pick
NOTE Confidence: 0.931700895833333
00:04:53.946 --> 00:04:56.361 up in the central nervous system that
NOTE Confidence: 0.931700895833333

00:04:56.429 --> 00:04:58.999 might explain this cortisol reduction.

NOTE Confidence: 0.949181016153846

00:05:00.800 --> 00:05:02.774 The next question then it's related

NOTE Confidence: 0.949181016153846

00:05:02.774 --> 00:05:04.960 to the study that we are doing.

NOTE Confidence: 0.949181016153846

00:05:04.960 --> 00:05:07.240 So it says the person asks,

NOTE Confidence: 0.949181016153846

00:05:07.240 --> 00:05:08.795 I have already joined and

NOTE Confidence: 0.949181016153846

00:05:08.795 --> 00:05:10.039 completed the initial survey,

NOTE Confidence: 0.949181016153846

00:05:10.040 --> 00:05:11.825 are we able to participate in a

NOTE Confidence: 0.949181016153846

00:05:11.825 --> 00:05:13.674 study in which they are looking

NOTE Confidence: 0.949181016153846

00:05:13.674 --> 00:05:15.038 for things like cytokines,

NOTE Confidence: 0.949181016153846

00:05:15.040 --> 00:05:16.440 cortisol, etcetera,

NOTE Confidence: 0.88630349

00:05:17.680 --> 00:05:20.320 right. So the lesson study,

NOTE Confidence: 0.88630349

00:05:20.320 --> 00:05:22.606 it is currently collecting all the

NOTE Confidence: 0.88630349

00:05:22.606 --> 00:05:25.399 surveys from all of the participants,

NOTE Confidence: 0.88630349

00:05:25.400 --> 00:05:27.052 which is really important.

NOTE Confidence: 0.88630349

00:05:27.052 --> 00:05:29.416 That's what allowed us to look

NOTE Confidence: 0.88630349

00:05:29.416 --> 00:05:31.752 at the demographics and symptoms

NOTE Confidence: 0.88630349

00:05:31.752 --> 00:05:34.680 in people with long COVID versus

NOTE Confidence: 0.88630349

00:05:34.680 --> 00:05:37.200 post vaccine long haul and so on.

NOTE Confidence: 0.88630349

00:05:37.200 --> 00:05:38.424 And in the future,

NOTE Confidence: 0.88630349

00:05:38.424 --> 00:05:39.954 in a very near future,

NOTE Confidence: 0.88630349

00:05:39.960 --> 00:05:42.585 we will be asking some of the

NOTE Confidence: 0.88630349

00:05:42.585 --> 00:05:44.104 participants to participate in

NOTE Confidence: 0.88630349

00:05:44.104 --> 00:05:46.078 research study where we are going

NOTE Confidence: 0.88630349

00:05:46.078 --> 00:05:48.630 to be looking at all the different

NOTE Confidence: 0.88630349

00:05:48.630 --> 00:05:51.460 parameters that we've studied in the My

NOTE Confidence: 0.88630349

00:05:51.460 --> 00:05:54.360 long COVID study including cytokines,

NOTE Confidence: 0.88630349

00:05:54.360 --> 00:05:57.925 antibodies and then cortisol levels

NOTE Confidence: 0.88630349

00:05:57.925 --> 00:06:00.184 and many other features that

NOTE Confidence: 0.88630349

00:06:00.184 --> 00:06:02.114 we are currently looking into.

NOTE Confidence: 0.88630349

00:06:02.120 --> 00:06:04.694 So yes, some of the listened

NOTE Confidence: 0.88630349

00:06:04.694 --> 00:06:06.800 participants will be contacted to

NOTE Confidence: 0.88630349

00:06:06.800 --> 00:06:08.991 see if they also want to provide
NOTE Confidence: 0.88630349

00:06:08.991 --> 00:06:10.998 a blood samples or saliva.
NOTE Confidence: 0.96373857

00:06:12.720 --> 00:06:14.850 So this is another question
NOTE Confidence: 0.96373857

00:06:14.850 --> 00:06:16.554 from an interested participant.
NOTE Confidence: 0.96373857

00:06:16.560 --> 00:06:19.116 Very much agree with the urgency
NOTE Confidence: 0.96373857

00:06:19.116 --> 00:06:20.394 for vaccine complications.
NOTE Confidence: 0.96373857

00:06:20.400 --> 00:06:22.140 So much information coming out
NOTE Confidence: 0.96373857

00:06:22.140 --> 00:06:23.880 from everywhere on long COVID.
NOTE Confidence: 0.96373857

00:06:23.880 --> 00:06:27.121 But Yale Listen is the only major
NOTE Confidence: 0.96373857

00:06:27.121 --> 00:06:29.800 institution even mentioning vaccine effects.
NOTE Confidence: 0.96373857

00:06:29.800 --> 00:06:31.990 Can you increase profile of
NOTE Confidence: 0.96373857

00:06:31.990 --> 00:06:33.304 vaccine complication research
NOTE Confidence: 0.96373857

00:06:33.304 --> 00:06:35.759 since you are the only one doing?
NOTE Confidence: 0.96373857

00:06:35.760 --> 00:06:37.840 It's hard to maintain pro
NOTE Confidence: 0.96373857

00:06:37.840 --> 00:06:39.920 vaccine stance in the absence
NOTE Confidence: 0.96373857

00:06:40.000 --> 00:06:42.120 of etiology or therapeutics.

NOTE Confidence: 0.96373857

00:06:42.120 --> 00:06:44.080 Very hesitantly got the booster,

NOTE Confidence: 0.96373857

00:06:44.080 --> 00:06:46.390 but I'm quite worried that I'm an

NOTE Confidence: 0.96373857

00:06:46.390 --> 00:06:48.480 idiot to continue to get boosters.

NOTE Confidence: 0.7975786

00:06:50.600 --> 00:06:52.826 Well this is yeah,

NOTE Confidence: 0.7975786

00:06:52.826 --> 00:06:54.556 I'm sorry that you're suffering

NOTE Confidence: 0.7975786

00:06:54.556 --> 00:06:57.970 from this and I hope you did not

NOTE Confidence: 0.7975786

00:06:57.970 --> 00:07:00.477 suffer any post booster effect.

NOTE Confidence: 0.7975786

00:07:00.477 --> 00:07:03.072 So the currently it's frustrating

NOTE Confidence: 0.7975786

00:07:03.072 --> 00:07:06.379 that we don't even understand what

NOTE Confidence: 0.7975786

00:07:06.379 --> 00:07:09.312 to recommend to people who have a

NOTE Confidence: 0.7975786

00:07:09.312 --> 00:07:12.118 long COVID or post vaccine issues

NOTE Confidence: 0.7975786

00:07:12.120 --> 00:07:14.046 whether they the the boosters are

NOTE Confidence: 0.7975786

00:07:14.046 --> 00:07:16.385 going to be safe and what percentage

NOTE Confidence: 0.7975786

00:07:16.385 --> 00:07:18.734 of the people are going to have

NOTE Confidence: 0.7975786

00:07:18.734 --> 00:07:20.978 a similar kind of symptoms that

NOTE Confidence: 0.7975786

00:07:20.978 --> 00:07:22.959 they experience with other shots.
NOTE Confidence: 0.7975786

00:07:22.960 --> 00:07:26.296 So without having the the data
NOTE Confidence: 0.7975786

00:07:26.296 --> 00:07:30.119 to support one way or the other,
NOTE Confidence: 0.7975786

00:07:30.120 --> 00:07:33.080 boosters are obviously very important
NOTE Confidence: 0.7975786

00:07:33.080 --> 00:07:35.448 for providing protection from
NOTE Confidence: 0.7975786

00:07:35.448 --> 00:07:38.168 severe disease from the current
NOTE Confidence: 0.7975786

00:07:38.168 --> 00:07:40.576 Omicron pandemic that's going on.
NOTE Confidence: 0.7975786

00:07:40.576 --> 00:07:43.492 And so you're not at all idiot
NOTE Confidence: 0.7975786

00:07:43.492 --> 00:07:46.797 to to get the booster and I I
NOTE Confidence: 0.7975786

00:07:46.797 --> 00:07:49.671 really hope you didn't suffer any
NOTE Confidence: 0.7975786

00:07:49.671 --> 00:07:51.871 consequences that are more than
NOTE Confidence: 0.7975786

00:07:51.871 --> 00:07:56.480 just regular React reactogenicities.
NOTE Confidence: 0.7975786

00:07:56.480 --> 00:07:57.330 So yeah,
NOTE Confidence: 0.7975786

00:07:57.330 --> 00:07:59.455 this is a very important
NOTE Confidence: 0.7975786

00:07:59.455 --> 00:08:02.249 question and and as I mentioned
NOTE Confidence: 0.7975786

00:08:02.249 --> 00:08:04.639 earlier in my other responses,

NOTE Confidence: 0.7975786

00:08:04.640 --> 00:08:07.070 you know the vaccine post vaccine

NOTE Confidence: 0.7975786

00:08:07.070 --> 00:08:09.553 syndrome that that we are seeing

NOTE Confidence: 0.7975786

00:08:09.553 --> 00:08:12.290 here in the lesson study and and

NOTE Confidence: 0.7975786

00:08:12.290 --> 00:08:14.166 elsewhere in the world hasn't

NOTE Confidence: 0.7975786

00:08:14.166 --> 00:08:15.744 been studied rigorously.

NOTE Confidence: 0.7975786

00:08:15.744 --> 00:08:19.847 And that's what we're trying to do with

NOTE Confidence: 0.7975786

00:08:19.847 --> 00:08:22.836 the lesson and to elevate the profile.

NOTE Confidence: 0.7975786

00:08:22.840 --> 00:08:25.024 I think the best way to elevate

NOTE Confidence: 0.7975786

00:08:25.024 --> 00:08:27.578 the profile is actually doing the

NOTE Confidence: 0.7975786

00:08:27.578 --> 00:08:29.634 study and demonstrating biological

NOTE Confidence: 0.7975786

00:08:29.640 --> 00:08:33.165 factors that correlate with vaccine

NOTE Confidence: 0.7975786

00:08:33.165 --> 00:08:35.280 related adverse events.

NOTE Confidence: 0.7975786

00:08:35.280 --> 00:08:37.800 That way we can understand the

NOTE Confidence: 0.7975786

00:08:37.800 --> 00:08:39.994 underlying etiology of that disease

NOTE Confidence: 0.7975786

00:08:39.994 --> 00:08:42.604 and whether that's related to long

NOTE Confidence: 0.7975786

00:08:42.604 --> 00:08:45.380 COVID and ultimately the driver
NOTE Confidence: 0.7975786

00:08:45.380 --> 00:08:47.720 of of those diseases.
NOTE Confidence: 0.7975786

00:08:47.720 --> 00:08:50.702 So we are hoping that through doing
NOTE Confidence: 0.7975786

00:08:50.702 --> 00:08:53.128 rigorous studies that we will be
NOTE Confidence: 0.7975786

00:08:53.128 --> 00:08:55.480 able to highlight and elevate the
NOTE Confidence: 0.7975786

00:08:55.480 --> 00:08:58.078 importance of doing such a study.
NOTE Confidence: 0.7975786

00:08:58.080 --> 00:09:01.265 And that's why at Yale lesson we
NOTE Confidence: 0.7975786

00:09:01.265 --> 00:09:04.165 are dedicated to figuring out both
NOTE Confidence: 0.7975786

00:09:04.165 --> 00:09:06.440 kinds of diseases at the same time.
NOTE Confidence: 0.7764292975

00:09:08.160 --> 00:09:11.560 So here's a question about the viral genome.
NOTE Confidence: 0.7764292975

00:09:11.560 --> 00:09:14.269 Do we know if there has been a study
NOTE Confidence: 0.7764292975

00:09:14.269 --> 00:09:17.463 that analyzed full genome of virus
NOTE Confidence: 0.7764292975

00:09:17.463 --> 00:09:19.715 indicating replicating competent virus?
NOTE Confidence: 0.9589227333333333

00:09:21.400 --> 00:09:24.725 OK. So I think this question pertains
NOTE Confidence: 0.9589227333333333

00:09:24.725 --> 00:09:29.252 to the viral reservoir or OK.
NOTE Confidence: 0.9589227333333333

00:09:29.252 --> 00:09:33.070 So yeah, I I don't know of any

NOTE Confidence: 0.958922733333333
00:09:33.070 --> 00:09:35.650 studies that have test looked at
NOTE Confidence: 0.958922733333333
00:09:35.650 --> 00:09:38.591 the sequences of the viral genome
NOTE Confidence: 0.958922733333333
00:09:38.591 --> 00:09:40.679 that's within these tissues.
NOTE Confidence: 0.958922733333333
00:09:40.680 --> 00:09:43.674 That's a very important question and
NOTE Confidence: 0.958922733333333
00:09:43.674 --> 00:09:45.670 very important research endeavor
NOTE Confidence: 0.958922733333333
00:09:45.747 --> 00:09:47.630 to actually do because right now
NOTE Confidence: 0.958922733333333
00:09:47.630 --> 00:09:49.900 we don't know whether the bits of
NOTE Confidence: 0.958922733333333
00:09:49.900 --> 00:09:52.360 RNA that people are detecting from
NOTE Confidence: 0.958922733333333
00:09:52.360 --> 00:09:54.040 intestinal biopsies for example,
NOTE Confidence: 0.958922733333333
00:09:54.040 --> 00:09:57.320 whether they represent fully replication
NOTE Confidence: 0.958922733333333
00:09:57.320 --> 00:10:00.600 competent virus or some defective,
NOTE Confidence: 0.958922733333333
00:10:00.600 --> 00:10:02.820 you know, particle or just segments
NOTE Confidence: 0.958922733333333
00:10:02.820 --> 00:10:05.868 of the genome that remains somehow in
NOTE Confidence: 0.958922733333333
00:10:05.868 --> 00:10:08.353 different compartments within the cell.
NOTE Confidence: 0.958922733333333
00:10:08.360 --> 00:10:10.677 So this is a very important question
NOTE Confidence: 0.958922733333333

00:10:10.677 --> 00:10:12.599 that needs to be addressed.
NOTE Confidence: 0.9589227333333333

00:10:12.600 --> 00:10:15.795 I I haven't seen much studies on that yet.
NOTE Confidence: 0.847243995714286

00:10:17.800 --> 00:10:19.885 Here is a question about
NOTE Confidence: 0.847243995714286

00:10:19.885 --> 00:10:20.719 mitochondrial damage.
NOTE Confidence: 0.847243995714286

00:10:20.720 --> 00:10:22.460 So the participant is asking
NOTE Confidence: 0.847243995714286

00:10:22.460 --> 00:10:24.719 how much focus is being placed
NOTE Confidence: 0.847243995714286

00:10:24.719 --> 00:10:26.487 on mitochondrial damage related
NOTE Confidence: 0.847243995714286

00:10:26.487 --> 00:10:28.697 to vaccine injury and viral
NOTE Confidence: 0.847243995714286

00:10:28.773 --> 00:10:30.915 induced long haul or long COVID,
NOTE Confidence: 0.92304018

00:10:32.280 --> 00:10:35.896 Right. So one of the the key physiological
NOTE Confidence: 0.92304018

00:10:35.896 --> 00:10:38.572 defects that are have been reported
NOTE Confidence: 0.92304018

00:10:38.572 --> 00:10:42.651 for at least long COVID is that oxygen
NOTE Confidence: 0.92304018

00:10:42.651 --> 00:10:46.593 utilization by tissue is quite impaired,
NOTE Confidence: 0.92304018

00:10:46.600 --> 00:10:48.640 meaning that even though they're
NOTE Confidence: 0.92304018

00:10:48.640 --> 00:10:51.120 circulating oxygen levels in the blood,
NOTE Confidence: 0.92304018

00:10:51.120 --> 00:10:53.616 that blood blood oxygen isn't being

NOTE Confidence: 0.92304018

00:10:53.616 --> 00:10:56.421 properly utilized by the tissue like the

NOTE Confidence: 0.92304018

00:10:56.421 --> 00:10:59.320 muscles and other areas that we all need.

NOTE Confidence: 0.92304018

00:10:59.320 --> 00:11:02.316 Every cell in the body needs oxygen,

NOTE Confidence: 0.92304018

00:11:02.320 --> 00:11:05.518 whether that stems from mitochondrial defect,

NOTE Confidence: 0.92304018

00:11:05.520 --> 00:11:06.844 mitochondrial damage,

NOTE Confidence: 0.92304018

00:11:06.844 --> 00:11:10.816 or whether it stems from vascular

NOTE Confidence: 0.92304018

00:11:10.816 --> 00:11:14.085 defect or microcloths or some other

NOTE Confidence: 0.92304018

00:11:14.085 --> 00:11:17.120 issues we don't quite understand yet.

NOTE Confidence: 0.92304018

00:11:17.120 --> 00:11:21.422 There is plenty of evidence for platelet

NOTE Confidence: 0.92304018

00:11:21.422 --> 00:11:25.874 activation and micro clot formation and

NOTE Confidence: 0.92304018

00:11:25.880 --> 00:11:30.616 vascular damage in long COVID patients and

NOTE Confidence: 0.92304018

00:11:30.616 --> 00:11:33.752 and and that could certainly results in

NOTE Confidence: 0.92304018

00:11:33.752 --> 00:11:36.678 the reduced use of oxygen by the tissue.

NOTE Confidence: 0.92304018

00:11:36.680 --> 00:11:39.105 So whether the defect is

NOTE Confidence: 0.92304018

00:11:39.105 --> 00:11:40.560 upstream of mitochondria,

NOTE Confidence: 0.92304018

00:11:40.560 --> 00:11:42.785 or within the mitochondria or
NOTE Confidence: 0.92304018

00:11:42.785 --> 00:11:44.120 downstream of mitochondria,
NOTE Confidence: 0.92304018

00:11:44.120 --> 00:11:47.800 we don't quite understand well.
NOTE Confidence: 0.92304018

00:11:47.800 --> 00:11:50.904 Our team is also looking into this by
NOTE Confidence: 0.92304018

00:11:50.904 --> 00:11:54.277 looking at morphology of the mitochondria.
NOTE Confidence: 0.92304018

00:11:54.280 --> 00:11:56.800 We are collaborating with an expert
NOTE Confidence: 0.92304018

00:11:56.800 --> 00:11:59.060 Doctor Thomas Horvath at Yale
NOTE Confidence: 0.92304018

00:11:59.060 --> 00:12:01.826 University who looks at this using
NOTE Confidence: 0.92304018

00:12:01.826 --> 00:12:04.356 electron microscopy and we're also
NOTE Confidence: 0.92304018

00:12:04.356 --> 00:12:06.958 measuring the function of mitochondria
NOTE Confidence: 0.92304018

00:12:06.958 --> 00:12:09.916 from the people with long COVID.
NOTE Confidence: 0.92304018

00:12:09.920 --> 00:12:12.848 And obviously once the listen study
NOTE Confidence: 0.92304018

00:12:12.848 --> 00:12:15.794 launches we would love to do the
NOTE Confidence: 0.92304018

00:12:15.794 --> 00:12:17.588 same for vaccine related adverse
NOTE Confidence: 0.92304018

00:12:17.588 --> 00:12:20.360 event people with with that as well.
NOTE Confidence: 0.901406806470588

00:12:21.320 --> 00:12:23.642 Thank you. Here is a participant

NOTE Confidence: 0.901406806470588
00:12:23.642 --> 00:12:26.835 who wants to know a little more
NOTE Confidence: 0.901406806470588
00:12:26.835 --> 00:12:28.915 about post vaccination syndromes.
NOTE Confidence: 0.901406806470588
00:12:28.920 --> 00:12:30.424 This participant first congratulates
NOTE Confidence: 0.901406806470588
00:12:30.424 --> 00:12:33.508 you for your amazing work and then the
NOTE Confidence: 0.901406806470588
00:12:33.508 --> 00:12:35.418 question is post vaccination syndromes
NOTE Confidence: 0.901406806470588
00:12:35.418 --> 00:12:37.481 have never formally been studied even
NOTE Confidence: 0.901406806470588
00:12:37.481 --> 00:12:39.958 though we have seen them for HPV vaccines.
NOTE Confidence: 0.901406806470588
00:12:39.958 --> 00:12:43.304 Have you looked into G protein coupled
NOTE Confidence: 0.901406806470588
00:12:43.304 --> 00:12:45.520 receptor antibodies which have been
NOTE Confidence: 0.901406806470588
00:12:45.520 --> 00:12:48.278 identified in patients with POTS or DIS,
NOTE Confidence: 0.901406806470588
00:12:48.280 --> 00:12:51.320 Autonomia, long COVID and MECFS?
NOTE Confidence: 0.852438615714286
00:12:52.880 --> 00:12:55.334 Right. So because we have the
NOTE Confidence: 0.852438615714286
00:12:55.334 --> 00:12:56.970 fortune of collaborating with
NOTE Confidence: 0.852438615714286
00:12:57.044 --> 00:13:00.880 Doctor Aaron Ring's lab who has
NOTE Confidence: 0.852438615714286
00:13:00.880 --> 00:13:04.000 multiple GPCRS included in the REAP,
NOTE Confidence: 0.852438615714286

00:13:04.000 --> 00:13:07.088 we are able to detect if there are
NOTE Confidence: 0.852438615714286

00:13:07.088 --> 00:13:10.040 any of auto antibodies against GPCRS.
NOTE Confidence: 0.852438615714286

00:13:10.040 --> 00:13:12.476 And you know we are seeing,
NOTE Confidence: 0.852438615714286

00:13:12.480 --> 00:13:15.735 I mean so even healthy people have
NOTE Confidence: 0.852438615714286

00:13:15.735 --> 00:13:17.810 have multiple auto antibodies that
NOTE Confidence: 0.852438615714286

00:13:17.810 --> 00:13:20.400 that don't really cause any diseases.
NOTE Confidence: 0.852438615714286

00:13:20.400 --> 00:13:22.746 So it's very important to understand
NOTE Confidence: 0.852438615714286

00:13:22.746 --> 00:13:25.104 how different are these anti GPCR
NOTE Confidence: 0.852438615714286

00:13:25.104 --> 00:13:27.424 antibodies in a disease group
NOTE Confidence: 0.852438615714286

00:13:27.424 --> 00:13:30.000 compared to the healthy control.
NOTE Confidence: 0.852438615714286

00:13:30.000 --> 00:13:33.171 And so far studies that the the
NOTE Confidence: 0.852438615714286

00:13:33.171 --> 00:13:35.605 questioner is referring to hasn't
NOTE Confidence: 0.852438615714286

00:13:35.605 --> 00:13:38.445 done that hasn't really compared Potts
NOTE Confidence: 0.852438615714286

00:13:38.445 --> 00:13:40.635 versus healthy controls and so on.
NOTE Confidence: 0.852438615714286

00:13:40.640 --> 00:13:42.888 And there is a study that that has
NOTE Confidence: 0.852438615714286

00:13:42.888 --> 00:13:44.986 compared on the GPCR antibody levels

NOTE Confidence: 0.852438615714286
00:13:44.986 --> 00:13:47.188 in Potts versus healthy control and
NOTE Confidence: 0.852438615714286
00:13:47.253 --> 00:13:48.903 they haven't found any differences
NOTE Confidence: 0.852438615714286
00:13:48.903 --> 00:13:51.001 in the level or the intensity.
NOTE Confidence: 0.852438615714286
00:13:51.001 --> 00:13:54.529 So we have to be cautious like every
NOTE Confidence: 0.852438615714286
00:13:54.529 --> 00:13:57.618 study needs to be looked at with this
NOTE Confidence: 0.852438615714286
00:13:57.618 --> 00:14:00.560 with the eye of whether there has
NOTE Confidence: 0.852438615714286
00:14:00.560 --> 00:14:03.320 been a proper control group included.
NOTE Confidence: 0.852438615714286
00:14:03.320 --> 00:14:04.082 And if not,
NOTE Confidence: 0.852438615714286
00:14:04.082 --> 00:14:07.280 we need to be able to do that in the future.
NOTE Confidence: 0.852438615714286
00:14:07.280 --> 00:14:10.202 Otherwise we may be you know
NOTE Confidence: 0.852438615714286
00:14:10.202 --> 00:14:12.788 focusing on antibody auto antibodies
NOTE Confidence: 0.852438615714286
00:14:12.788 --> 00:14:16.034 that are not at all pathologic.
NOTE Confidence: 0.852438615714286
00:14:16.040 --> 00:14:16.901 As I mentioned,
NOTE Confidence: 0.852438615714286
00:14:16.901 --> 00:14:18.910 all of us carry lots of auto
NOTE Confidence: 0.852438615714286
00:14:18.979 --> 00:14:21.199 antibodies that don't do anything.
NOTE Confidence: 0.852438615714286

00:14:21.200 --> 00:14:23.419 So let's just be cautious about that
NOTE Confidence: 0.852438615714286

00:14:23.419 --> 00:14:26.595 to to do a proper study with the right
NOTE Confidence: 0.852438615714286

00:14:26.595 --> 00:14:29.307 controls and then see if there are
NOTE Confidence: 0.852438615714286

00:14:29.307 --> 00:14:32.114 specific auto antibodies that are coming up.
NOTE Confidence: 0.852438615714286

00:14:32.120 --> 00:14:35.318 So far with our Mylon COVID,
NOTE Confidence: 0.852438615714286

00:14:35.320 --> 00:14:37.560 we are not seeing specific
NOTE Confidence: 0.852438615714286

00:14:37.560 --> 00:14:39.800 anti GPCR antibodies that are
NOTE Confidence: 0.852438615714286

00:14:39.880 --> 00:14:42.440 enriched in long COVID patients.
NOTE Confidence: 0.904240243076923

00:14:44.080 --> 00:14:45.133 Thank you, Akiko.
NOTE Confidence: 0.904240243076923

00:14:45.133 --> 00:14:46.888 So the next question is
NOTE Confidence: 0.904240243076923

00:14:46.888 --> 00:14:49.200 from a participant who says,
NOTE Confidence: 0.904240243076923

00:14:49.200 --> 00:14:51.610 so we are still identifying
NOTE Confidence: 0.904240243076923

00:14:51.610 --> 00:14:54.020 characteristics of long COVID and
NOTE Confidence: 0.904240243076923

00:14:54.107 --> 00:14:56.555 there is no focus on pathology.
NOTE Confidence: 0.904240243076923

00:14:56.560 --> 00:14:57.640 So that's the question.
NOTE Confidence: 0.8644160475

00:14:58.240 --> 00:14:59.790 Oh, I'm sorry. Can you

NOTE Confidence: 0.8644160475

00:14:59.790 --> 00:15:00.880 repeat the question? Yeah,

NOTE Confidence: 0.93584762

00:15:00.920 --> 00:15:03.286 sure. So the participant is a little

NOTE Confidence: 0.93584762

00:15:03.286 --> 00:15:05.820 upset that we are still identifying

NOTE Confidence: 0.93584762

00:15:05.820 --> 00:15:08.225 characteristics of long COVID without

NOTE Confidence: 0.93584762

00:15:08.225 --> 00:15:10.720 focusing on the pathology so far. Oh,

NOTE Confidence: 0.955292635

00:15:11.920 --> 00:15:14.440 I see. Well, that's what we're trying

NOTE Confidence: 0.955292635

00:15:14.440 --> 00:15:16.908 to focus on with our own studies.

NOTE Confidence: 0.955292635

00:15:16.908 --> 00:15:20.025 It's to look at the what is the

NOTE Confidence: 0.955292635

00:15:20.025 --> 00:15:22.405 pathology and more specifically what

NOTE Confidence: 0.955292635

00:15:22.405 --> 00:15:25.120 is the pathogenesis of this disease,

NOTE Confidence: 0.955292635

00:15:25.120 --> 00:15:28.348 which means what are the molecular

NOTE Confidence: 0.955292635

00:15:28.348 --> 00:15:31.022 triggers that ultimately results in

NOTE Confidence: 0.955292635

00:15:31.022 --> 00:15:33.638 the defects that are being detected

NOTE Confidence: 0.955292635

00:15:33.640 --> 00:15:36.629 in the patients with one COVID or

NOTE Confidence: 0.955292635

00:15:36.629 --> 00:15:38.520 vaccine related adverse events.

NOTE Confidence: 0.955292635

00:15:38.520 --> 00:15:40.325 So for instance the vascular
NOTE Confidence: 0.955292635

00:15:40.325 --> 00:15:42.555 damage and things like that are
NOTE Confidence: 0.955292635

00:15:42.555 --> 00:15:44.330 downstream of something that happens
NOTE Confidence: 0.955292635

00:15:44.330 --> 00:15:46.720 as a result of the infection.
NOTE Confidence: 0.955292635

00:15:46.720 --> 00:15:49.408 We want to connect the dots between the
NOTE Confidence: 0.955292635

00:15:49.408 --> 00:15:51.896 infection all the way to the pathology
NOTE Confidence: 0.955292635

00:15:51.896 --> 00:15:54.280 that's being detected in these patients.
NOTE Confidence: 0.955292635

00:15:54.280 --> 00:15:55.844 So without that line,
NOTE Confidence: 0.955292635

00:15:55.844 --> 00:15:57.799 it's very difficult to intervene
NOTE Confidence: 0.955292635

00:15:57.799 --> 00:15:59.424 with this process, right.
NOTE Confidence: 0.955292635

00:15:59.424 --> 00:16:02.160 So if what if we want to give the
NOTE Confidence: 0.955292635

00:16:02.160 --> 00:16:04.908 most promising therapy for people who
NOTE Confidence: 0.955292635

00:16:04.908 --> 00:16:07.480 are suffering from these diseases,
NOTE Confidence: 0.955292635

00:16:07.480 --> 00:16:09.517 we really need to know the driver.
NOTE Confidence: 0.955292635

00:16:09.520 --> 00:16:11.676 And in order to understand the driver,
NOTE Confidence: 0.955292635

00:16:11.680 --> 00:16:14.720 you need to just deeply profile these people.

NOTE Confidence: 0.955292635

00:16:14.720 --> 00:16:17.160 And and that's what the whole purpose of.

NOTE Confidence: 0.955292635

00:16:17.160 --> 00:16:19.920 Yeah, listen study is.

NOTE Confidence: 0.955292635

00:16:19.920 --> 00:16:20.160 Thank

NOTE Confidence: 0.930256124375

00:16:20.160 --> 00:16:22.904 you, Kiko. So this brings me to the

NOTE Confidence: 0.930256124375

00:16:22.904 --> 00:16:25.275 last question that I have on my list.

NOTE Confidence: 0.930256124375

00:16:25.280 --> 00:16:28.115 So the last question is about EBV

NOTE Confidence: 0.930256124375

00:16:28.115 --> 00:16:29.639 reactivation. The question is,

NOTE Confidence: 0.930256124375

00:16:29.639 --> 00:16:32.600 could the EBV or other latent viruses,

NOTE Confidence: 0.930256124375

00:16:32.600 --> 00:16:35.360 reactivation of which be mainly due

NOTE Confidence: 0.930256124375

00:16:35.445 --> 00:16:38.160 to the overall TH1 to TH2 shift?

NOTE Confidence: 0.873251065

00:16:39.760 --> 00:16:42.994 Yeah, I mean, I'd love to know

NOTE Confidence: 0.873251065

00:16:42.994 --> 00:16:45.559 why EBV reactivation is occurring

NOTE Confidence: 0.873251065

00:16:45.560 --> 00:16:49.556 in a subset of long haulers.

NOTE Confidence: 0.873251065

00:16:49.560 --> 00:16:50.628 There are many theories.

NOTE Confidence: 0.873251065

00:16:50.628 --> 00:16:52.920 We don't have a a real answer yet,

NOTE Confidence: 0.873251065

00:16:52.920 --> 00:16:57.246 but many sort of triggers can cause

NOTE Confidence: 0.873251065

00:16:57.246 --> 00:17:00.839 reactivation of these latent viruses,

NOTE Confidence: 0.873251065

00:17:00.840 --> 00:17:04.848 one of which is defect in T

NOTE Confidence: 0.873251065

00:17:04.848 --> 00:17:07.720 cell surveillance of these viral

NOTE Confidence: 0.873251065

00:17:07.720 --> 00:17:10.484 latent viruses and that may be

NOTE Confidence: 0.873251065

00:17:10.484 --> 00:17:12.439 what's happening in these people.

NOTE Confidence: 0.873251065

00:17:12.440 --> 00:17:15.416 So Jim Heath's group has shown

NOTE Confidence: 0.873251065

00:17:15.416 --> 00:17:17.937 nicely looking at the longitudinal

NOTE Confidence: 0.873251065

00:17:17.937 --> 00:17:21.159 study from the time of COVID

NOTE Confidence: 0.873251065

00:17:21.159 --> 00:17:24.070 infection to three months post

NOTE Confidence: 0.873251065

00:17:24.070 --> 00:17:28.520 COVID infection that there is this,

NOTE Confidence: 0.873251065

00:17:28.520 --> 00:17:31.256 the viremia that occurs as a

NOTE Confidence: 0.873251065

00:17:31.256 --> 00:17:33.379 result of EBB reactivation happens

NOTE Confidence: 0.873251065

00:17:33.379 --> 00:17:35.472 in a subset of people who who

NOTE Confidence: 0.873251065

00:17:35.472 --> 00:17:37.798 then go on to develop long COVID.

NOTE Confidence: 0.873251065

00:17:37.800 --> 00:17:40.464 So it's one of the four risk factors

NOTE Confidence: 0.873251065

00:17:40.464 --> 00:17:42.458 for developing long COVID that you

NOTE Confidence: 0.873251065

00:17:42.458 --> 00:17:44.800 can look at during the acute phase.

NOTE Confidence: 0.873251065

00:17:44.800 --> 00:17:47.968 So that to me suggests that this ebb

NOTE Confidence: 0.873251065

00:17:47.968 --> 00:17:51.832 latency is somehow broken or or like

NOTE Confidence: 0.873251065

00:17:51.832 --> 00:17:54.376 allowing to become reactivated as a

NOTE Confidence: 0.873251065

00:17:54.376 --> 00:17:57.200 result of the acute infection phase.

NOTE Confidence: 0.873251065

00:17:57.200 --> 00:18:00.245 And that could be because of the

NOTE Confidence: 0.873251065

00:18:00.245 --> 00:18:03.038 source code V2 viruses impact on

NOTE Confidence: 0.873251065

00:18:03.038 --> 00:18:06.279 T cells or surveillance by the T

NOTE Confidence: 0.873251065

00:18:06.377 --> 00:18:09.480 cells that is enabling these like

NOTE Confidence: 0.873251065

00:18:09.480 --> 00:18:12.120 latent viruses to become activated.

NOTE Confidence: 0.873251065

00:18:12.120 --> 00:18:13.840 There could be other reasons.

NOTE Confidence: 0.873251065

00:18:13.840 --> 00:18:16.780 And one of my graduate students is

NOTE Confidence: 0.873251065

00:18:16.780 --> 00:18:19.476 actually looking at why this might

NOTE Confidence: 0.873251065

00:18:19.476 --> 00:18:22.633 happen using a variety of different models.

NOTE Confidence: 0.873251065

00:18:22.640 --> 00:18:23.374 Right now,

NOTE Confidence: 0.873251065

00:18:23.374 --> 00:18:25.943 we don't know how the ebb reactivated

NOTE Confidence: 0.873251065

00:18:25.943 --> 00:18:28.715 and what the consequences of that is.

NOTE Confidence: 0.873251065

00:18:28.720 --> 00:18:30.718 So it's a very important question,

NOTE Confidence: 0.873251065

00:18:30.720 --> 00:18:34.000 but we have very little data on that.

NOTE Confidence: 0.873251065

00:18:34.000 --> 00:18:34.360 OK, go.

NOTE Confidence: 0.881842149

00:18:34.600 --> 00:18:36.080 These were the questions that

NOTE Confidence: 0.881842149

00:18:36.080 --> 00:18:37.880 I had on my list. Thank you

NOTE Confidence: 0.964573681428572

00:18:37.920 --> 00:18:40.320 for your time. Thank you so much, Bernali.