

WEBVTT

NOTE duration: "01:02:43.059"

NOTE Confidence: 0.87553495

00:00:05.839 --> 00:00:07.060 Good afternoon, everyone,

NOTE Confidence: 0.9601423

00:00:08.240 --> 00:00:08.740 and,

NOTE Confidence: 0.9157026

00:00:09.679 --> 00:00:10.179 welcome.

NOTE Confidence: 0.9629118

00:00:11.679 --> 00:00:13.380 Welcome to this, inaugural

NOTE Confidence: 0.9388675

00:00:14.474 --> 00:00:15.375 webinar lecture,

NOTE Confidence: 0.9931476

00:00:15.915 --> 00:00:17.355 presented by the Yale Center

NOTE Confidence: 0.9931476

00:00:17.355 --> 00:00:18.574 for the Science of

NOTE Confidence: 0.9478894

00:00:18.875 --> 00:00:20.335 Cannabis and Cannabinoids.

NOTE Confidence: 0.93524295

00:00:21.355 --> 00:00:23.294 I'm, Deepak Cyril D'Souza.

NOTE Confidence: 0.81398356

00:00:24.154 --> 00:00:25.375 I'm thrilled,

NOTE Confidence: 0.9637692

00:00:26.154 --> 00:00:27.615 as we launch this webinar

NOTE Confidence: 0.9637692

00:00:27.675 --> 00:00:29.275 series, which was designed to

NOTE Confidence: 0.9637692

00:00:29.275 --> 00:00:29.775 support

NOTE Confidence: 0.97606945

00:00:30.449 --> 00:00:31.890 our mission and provide a

NOTE Confidence: 0.97606945

00:00:31.890 --> 00:00:32.390 platform,
NOTE Confidence: 0.98834974
00:00:34.290 --> 00:00:36.949 for meaningful dialogue and discovery
NOTE Confidence: 0.98834974
00:00:37.090 --> 00:00:38.530 about the science of cannabis
NOTE Confidence: 0.98834974
00:00:38.530 --> 00:00:39.190 and cannabinoids.
NOTE Confidence: 0.9912835
00:00:40.290 --> 00:00:42.149 The next four web webinars,
NOTE Confidence: 0.9912835
00:00:42.290 --> 00:00:43.829 which we will announce soon,
NOTE Confidence: 0.9912835
00:00:44.050 --> 00:00:44.629 are focused
NOTE Confidence: 0.9955522
00:00:45.265 --> 00:00:46.784 on the impact of cannabis
NOTE Confidence: 0.9955522
00:00:46.784 --> 00:00:47.845 on brain development.
NOTE Confidence: 0.98296344
00:00:49.184 --> 00:00:51.104 This is the inaugural webinar.
NOTE Confidence: 0.98296344
00:00:51.104 --> 00:00:52.325 And to kick it off,
NOTE Confidence: 0.9821888
00:00:52.784 --> 00:00:53.985 we are honored to have
NOTE Confidence: 0.9821888
00:00:53.985 --> 00:00:56.405 no other than, Yasmin Hurd
NOTE Confidence: 0.8133144
00:00:56.864 --> 00:00:57.845 as our inaugural,
NOTE Confidence: 0.99836963
00:00:58.625 --> 00:00:59.125 speaker.
NOTE Confidence: 0.9774311
00:00:59.740 --> 00:01:01.760 Doctor Hurd needs no introduction.

NOTE Confidence: 0.875052
00:01:02.540 --> 00:01:04.640 She is award Coleman chair
NOTE Confidence: 0.9824412
00:01:04.940 --> 00:01:06.400 of translation neuroscience
NOTE Confidence: 0.98287135
00:01:06.940 --> 00:01:07.980 and the director of the
NOTE Confidence: 0.98287135
00:01:07.980 --> 00:01:10.080 Addiction Institute at Mount Sinai.
NOTE Confidence: 0.97847265
00:01:10.620 --> 00:01:12.060 She's a she has a
NOTE Confidence: 0.97847265
00:01:12.060 --> 00:01:12.560 prolific
NOTE Confidence: 0.999663
00:01:13.185 --> 00:01:13.685 publication
NOTE Confidence: 0.9881086
00:01:13.985 --> 00:01:15.665 record in in the top
NOTE Confidence: 0.9881086
00:01:15.665 --> 00:01:17.525 tier scientific journals.
NOTE Confidence: 0.9656847
00:01:18.545 --> 00:01:20.065 She was, she has many
NOTE Confidence: 0.9656847
00:01:20.065 --> 00:01:21.425 honors and awards, which I'm
NOTE Confidence: 0.9656847
00:01:21.425 --> 00:01:22.865 not going to spend time
NOTE Confidence: 0.9656847
00:01:22.865 --> 00:01:23.365 on,
NOTE Confidence: 0.9635076
00:01:23.905 --> 00:01:26.310 but, some important ones, she
NOTE Confidence: 0.9635076
00:01:26.310 --> 00:01:27.910 is, she was elected to
NOTE Confidence: 0.9635076

00:01:27.910 --> 00:01:29.450 the National Academy of Sciences,
NOTE Confidence: 0.9731917

00:01:30.630 --> 00:01:31.510 and this is one of
NOTE Confidence: 0.9731917

00:01:31.510 --> 00:01:32.870 the highest honors a scientist
NOTE Confidence: 0.9731917

00:01:32.870 --> 00:01:34.010 can receive recognizing
NOTE Confidence: 0.9852414

00:01:34.709 --> 00:01:36.630 their groundbreaking work. She's also
NOTE Confidence: 0.9852414

00:01:36.630 --> 00:01:38.250 elected to the National Academy
NOTE Confidence: 0.9969034

00:01:38.870 --> 00:01:39.610 of Medicine.
NOTE Confidence: 0.9345534

00:01:40.715 --> 00:01:42.174 She's a renowned neuroscientist,
NOTE Confidence: 0.94290495

00:01:42.795 --> 00:01:44.255 whose research has significantly,
NOTE Confidence: 0.9465166

00:01:46.395 --> 00:01:48.395 advanced our understanding of, drug
NOTE Confidence: 0.9465166

00:01:48.395 --> 00:01:49.935 addiction and related disorders.
NOTE Confidence: 0.9983021

00:01:50.955 --> 00:01:52.895 So we are really excited,
NOTE Confidence: 0.99174684

00:01:53.360 --> 00:01:54.560 Yasmin, that you could join
NOTE Confidence: 0.99174684

00:01:54.560 --> 00:01:55.760 us and help us kick
NOTE Confidence: 0.99174684

00:01:55.760 --> 00:01:57.940 off this webinar series. Thanks.
NOTE Confidence: 0.98478585

00:01:58.560 --> 00:02:00.080 Thanks so much for having

NOTE Confidence: 0.98478585
00:02:00.080 --> 00:02:01.520 me. Let me share my
NOTE Confidence: 0.98478585
00:02:01.520 --> 00:02:02.020 slide.
NOTE Confidence: 0.99870443
00:02:02.400 --> 00:02:03.860 And I do wanna say
NOTE Confidence: 0.78006434
00:02:04.320 --> 00:02:04.820 congratulations,
NOTE Confidence: 0.9579403
00:02:07.985 --> 00:02:09.264 to getting this,
NOTE Confidence: 0.92155486
00:02:09.745 --> 00:02:11.365 honor to be able to
NOTE Confidence: 0.92155486
00:02:11.505 --> 00:02:13.044 have the center for science
NOTE Confidence: 0.9569332
00:02:13.425 --> 00:02:14.945 the science of cannabis and
NOTE Confidence: 0.9569332
00:02:14.945 --> 00:02:17.345 and cannabinoids. So I look
NOTE Confidence: 0.9569332
00:02:17.345 --> 00:02:19.264 forward to seeing how your
NOTE Confidence: 0.9569332
00:02:19.264 --> 00:02:21.264 center develops and in continue
NOTE Confidence: 0.9569332
00:02:21.264 --> 00:02:21.925 to impact,
NOTE Confidence: 0.98373157
00:02:22.370 --> 00:02:23.250 you know, given all the
NOTE Confidence: 0.98373157
00:02:23.250 --> 00:02:24.530 work that you guys have
NOTE Confidence: 0.98373157
00:02:24.530 --> 00:02:25.569 all done and more to
NOTE Confidence: 0.98373157

00:02:25.569 --> 00:02:26.549 come, I know.
NOTE Confidence: 0.9941314
00:02:26.930 --> 00:02:28.310 Let me just move over
NOTE Confidence: 0.9941314
00:02:28.609 --> 00:02:29.430 all of these
NOTE Confidence: 0.9983669
00:02:29.969 --> 00:02:31.189 things floating around.
NOTE Confidence: 0.92992103
00:02:31.730 --> 00:02:32.230 So,
NOTE Confidence: 0.96703017
00:02:35.034 --> 00:02:36.474 clearly, for me, you know,
NOTE Confidence: 0.96703017
00:02:36.635 --> 00:02:37.674 as I said, I'm I'm
NOTE Confidence: 0.96703017
00:02:37.674 --> 00:02:39.435 really happy that you you
NOTE Confidence: 0.96703017
00:02:39.435 --> 00:02:41.375 received this this the center
NOTE Confidence: 0.9270081
00:02:41.995 --> 00:02:43.754 and the focus that it
NOTE Confidence: 0.9270081
00:02:43.754 --> 00:02:44.875 will have in the beginning,
NOTE Confidence: 0.9270081
00:02:44.875 --> 00:02:46.680 as you said, on development.
NOTE Confidence: 0.9270081
00:02:46.840 --> 00:02:48.040 Development, since a large part
NOTE Confidence: 0.9270081
00:02:48.040 --> 00:02:49.180 of the work that I
NOTE Confidence: 0.9270081
00:02:49.239 --> 00:02:50.439 I do on cannabis relates
NOTE Confidence: 0.9270081
00:02:50.439 --> 00:02:51.480 to that and in terms

NOTE Confidence: 0.9270081
00:02:51.480 --> 00:02:52.859 of thinking about pathways
NOTE Confidence: 0.975466
00:02:53.799 --> 00:02:54.459 to addiction.
NOTE Confidence: 0.93032634
00:02:54.760 --> 00:02:56.359 But it also is important,
NOTE Confidence: 0.93032634
00:02:56.359 --> 00:02:57.419 and I'll end with
NOTE Confidence: 0.9201746
00:02:58.040 --> 00:02:59.799 where we're seeing cannabis in
NOTE Confidence: 0.9201746
00:02:59.799 --> 00:03:01.260 regard to and cannabinoids
NOTE Confidence: 0.847334
00:03:01.639 --> 00:03:02.219 in particular
NOTE Confidence: 0.9698886
00:03:04.055 --> 00:03:05.495 to, giving us pathways from
NOTE Confidence: 0.9698886
00:03:05.495 --> 00:03:05.995 addiction.
NOTE Confidence: 0.9982212
00:03:06.615 --> 00:03:07.115 And
NOTE Confidence: 0.9833995
00:03:08.375 --> 00:03:09.835 I have nothing to disclose,
NOTE Confidence: 0.99330914
00:03:10.135 --> 00:03:11.895 unfortunately, right now. Hopefully, some
NOTE Confidence: 0.99330914
00:03:11.895 --> 00:03:12.855 things will come later on
NOTE Confidence: 0.99330914
00:03:12.855 --> 00:03:14.135 as we do more cannabis
NOTE Confidence: 0.99330914
00:03:14.135 --> 00:03:14.635 work.
NOTE Confidence: 0.9876129

00:03:15.320 --> 00:03:16.620 As all of you know,
NOTE Confidence: 0.9876129

00:03:16.840 --> 00:03:18.440 cannabis is now legal in
NOTE Confidence: 0.9876129

00:03:18.440 --> 00:03:19.960 most of the states in
NOTE Confidence: 0.9876129

00:03:19.960 --> 00:03:20.940 United States
NOTE Confidence: 0.9796562

00:03:21.320 --> 00:03:23.000 and in many different flavors.
NOTE Confidence: 0.9796562

00:03:23.000 --> 00:03:24.120 And one of the big
NOTE Confidence: 0.9796562

00:03:24.120 --> 00:03:25.820 issues is that this patchwork
NOTE Confidence: 0.9796562

00:03:26.120 --> 00:03:26.620 of
NOTE Confidence: 0.8219012

00:03:26.919 --> 00:03:27.419 legality,
NOTE Confidence: 0.9155407

00:03:27.720 --> 00:03:29.240 some have states having,
NOTE Confidence: 0.9901835

00:03:30.435 --> 00:03:32.615 legal use for recreational purposes
NOTE Confidence: 0.9866562

00:03:33.235 --> 00:03:35.235 or for medicinal purposes or
NOTE Confidence: 0.9866562

00:03:35.235 --> 00:03:37.075 both. And this definitely has
NOTE Confidence: 0.9866562

00:03:37.075 --> 00:03:38.435 led to a lot of
NOTE Confidence: 0.9866562

00:03:38.435 --> 00:03:39.415 issues statewide
NOTE Confidence: 0.93968165

00:03:40.115 --> 00:03:41.475 and where I think it

NOTE Confidence: 0.93968165
00:03:41.475 --> 00:03:43.315 even contributes to what I
NOTE Confidence: 0.93968165
00:03:43.315 --> 00:03:45.155 call today's perfect storm for
NOTE Confidence: 0.93968165
00:03:45.155 --> 00:03:45.655 cannabis.
NOTE Confidence: 0.9884582
00:03:46.170 --> 00:03:48.329 One, obviously, the increase in
NOTE Confidence: 0.9884582
00:03:48.329 --> 00:03:48.829 THC
NOTE Confidence: 0.9984592
00:03:49.129 --> 00:03:49.629 concentrations
NOTE Confidence: 0.99010307
00:03:50.010 --> 00:03:50.750 over time
NOTE Confidence: 0.82242954
00:03:51.290 --> 00:03:53.069 while another cannabinoid, CBD,
NOTE Confidence: 0.9312331
00:03:54.170 --> 00:03:55.930 is decreased because as you
NOTE Confidence: 0.9312331
00:03:55.930 --> 00:03:57.370 guys know, this very complex
NOTE Confidence: 0.9312331
00:03:57.370 --> 00:03:58.925 plant with so many cannabinoids.
NOTE Confidence: 0.9719154
00:03:59.465 --> 00:04:01.145 So this is, I think,
NOTE Confidence: 0.9719154
00:04:01.145 --> 00:04:02.425 one of the bases when
NOTE Confidence: 0.9719154
00:04:02.425 --> 00:04:04.345 you think about this complex
NOTE Confidence: 0.9719154
00:04:04.345 --> 00:04:06.345 plant with so many chemicals
NOTE Confidence: 0.9719154

00:04:06.345 --> 00:04:08.185 that, including over a hundred

NOTE Confidence: 0.9719154

00:04:08.185 --> 00:04:09.625 cannabinoids that we still do

NOTE Confidence: 0.9719154

00:04:09.625 --> 00:04:10.285 not know

NOTE Confidence: 0.98224723

00:04:10.790 --> 00:04:12.410 most of their biological,

NOTE Confidence: 0.96599376

00:04:13.190 --> 00:04:13.690 function.

NOTE Confidence: 0.99972063

00:04:14.390 --> 00:04:15.850 And the fact that

NOTE Confidence: 0.9991522

00:04:16.310 --> 00:04:17.290 it's not just

NOTE Confidence: 0.9724819

00:04:17.990 --> 00:04:19.190 the flower that has changed

NOTE Confidence: 0.9724819

00:04:19.190 --> 00:04:20.630 in regard to the amount

NOTE Confidence: 0.9724819

00:04:20.630 --> 00:04:22.964 of THC, but the the

NOTE Confidence: 0.9724819

00:04:22.964 --> 00:04:24.324 potency of a lot of

NOTE Confidence: 0.9724819

00:04:24.324 --> 00:04:25.284 the products that are out

NOTE Confidence: 0.9724819

00:04:25.284 --> 00:04:26.645 there today, I mean, there's

NOTE Confidence: 0.9724819

00:04:26.645 --> 00:04:27.944 a cornucopia of,

NOTE Confidence: 0.9757549

00:04:28.245 --> 00:04:29.685 you know, the the shutters,

NOTE Confidence: 0.9757549

00:04:29.685 --> 00:04:30.425 the damps,

NOTE Confidence: 0.9390756

00:04:31.044 --> 00:04:32.404 and many different routes of

NOTE Confidence: 0.9390756

00:04:32.404 --> 00:04:34.664 administration, obviously, not just smoking,

NOTE Confidence: 0.98285365

00:04:35.310 --> 00:04:36.550 the edibles that have all,

NOTE Confidence: 0.98285365

00:04:36.550 --> 00:04:38.270 you know, led to, again,

NOTE Confidence: 0.98285365

00:04:38.270 --> 00:04:39.890 more complexity of the storm.

NOTE Confidence: 0.98285365

00:04:40.190 --> 00:04:41.630 Another thing is not just

NOTE Confidence: 0.98285365

00:04:41.630 --> 00:04:42.130 the

NOTE Confidence: 0.9692378

00:04:42.990 --> 00:04:44.990 the cannabis and THC from

NOTE Confidence: 0.9692378

00:04:44.990 --> 00:04:46.990 the natural flower, but the

NOTE Confidence: 0.9692378

00:04:46.990 --> 00:04:48.670 semi synthetic products that are

NOTE Confidence: 0.9692378

00:04:48.670 --> 00:04:49.490 being created,

NOTE Confidence: 0.9943365

00:04:50.275 --> 00:04:52.055 again, because the federal government,

NOTE Confidence: 0.96818596

00:04:52.435 --> 00:04:53.335 when they they,

NOTE Confidence: 0.9880701

00:04:53.875 --> 00:04:55.414 made hemp, cannabis,

NOTE Confidence: 0.79347587

00:04:56.194 --> 00:04:56.694 legal,

NOTE Confidence: 0.9064689

00:04:57.235 --> 00:04:58.435 and so less than one
NOTE Confidence: 0.9064689

00:04:58.435 --> 00:04:59.974 point three percent THC,
NOTE Confidence: 0.97625583

00:05:00.595 --> 00:05:01.634 what it meant was that
NOTE Confidence: 0.97625583

00:05:01.634 --> 00:05:02.914 people then could take the
NOTE Confidence: 0.97625583

00:05:02.914 --> 00:05:04.354 the CBD that's in this
NOTE Confidence: 0.97625583

00:05:04.354 --> 00:05:05.735 hemp plant and chemically
NOTE Confidence: 0.9902241

00:05:06.080 --> 00:05:07.700 change them to THC,
NOTE Confidence: 0.94393206

00:05:08.240 --> 00:05:10.180 products, which are themselves potent.
NOTE Confidence: 0.8869018

00:05:10.640 --> 00:05:11.620 And then also
NOTE Confidence: 0.9627849

00:05:12.080 --> 00:05:13.839 rare cannabinoids that were found
NOTE Confidence: 0.9627849

00:05:13.839 --> 00:05:14.580 in the plant
NOTE Confidence: 0.9486833

00:05:14.960 --> 00:05:16.960 that were extremely potent, even
NOTE Confidence: 0.9486833

00:05:16.960 --> 00:05:18.560 greater than thirty percent more
NOTE Confidence: 0.9486833

00:05:18.560 --> 00:05:20.225 potent than delta nine THC,
NOTE Confidence: 0.9931116

00:05:20.685 --> 00:05:21.645 they can now make it
NOTE Confidence: 0.9931116

00:05:21.645 --> 00:05:22.145 synthetically.

NOTE Confidence: 0.982549
00:05:22.445 --> 00:05:23.485 So that's what we're up
NOTE Confidence: 0.982549
00:05:23.485 --> 00:05:24.764 against in our society. That's
NOTE Confidence: 0.982549
00:05:24.764 --> 00:05:26.145 why I call it today's
NOTE Confidence: 0.982549
00:05:26.285 --> 00:05:27.264 perfect storm.
NOTE Confidence: 0.95990366
00:05:27.725 --> 00:05:29.505 That perfect storm of increasing
NOTE Confidence: 0.95990366
00:05:29.565 --> 00:05:31.420 concentrations has also led, as
NOTE Confidence: 0.95990366
00:05:31.420 --> 00:05:32.620 you can see, to more
NOTE Confidence: 0.95990366
00:05:32.620 --> 00:05:34.060 cannabis being used in terms
NOTE Confidence: 0.95990366
00:05:34.060 --> 00:05:36.000 of as cannabis has become
NOTE Confidence: 0.95990366
00:05:36.140 --> 00:05:37.360 legal and the stigma.
NOTE Confidence: 0.96832645
00:05:37.820 --> 00:05:38.940 And I think rightly so
NOTE Confidence: 0.96832645
00:05:38.940 --> 00:05:39.740 in terms of, you know,
NOTE Confidence: 0.96832645
00:05:39.740 --> 00:05:41.260 decreasing the stigma of,
NOTE Confidence: 0.95150405
00:05:41.580 --> 00:05:42.460 and I should say the
NOTE Confidence: 0.95150405
00:05:42.460 --> 00:05:42.960 criminalization
NOTE Confidence: 0.96045786

00:05:43.580 --> 00:05:45.345 of cannabis use. But it
NOTE Confidence: 0.96045786

00:05:45.345 --> 00:05:46.944 has consequences, such as you
NOTE Confidence: 0.96045786

00:05:46.944 --> 00:05:48.565 see the increase in cannabis.
NOTE Confidence: 0.96045786

00:05:48.865 --> 00:05:49.824 But if you take that
NOTE Confidence: 0.96045786

00:05:49.824 --> 00:05:51.845 number of the increase in
NOTE Confidence: 0.96045786

00:05:51.904 --> 00:05:52.305 the,
NOTE Confidence: 0.9797515

00:05:52.865 --> 00:05:54.384 the use of cannabis, those
NOTE Confidence: 0.9797515

00:05:54.384 --> 00:05:55.585 who are using daily or
NOTE Confidence: 0.9797515

00:05:55.585 --> 00:05:57.505 near daily are now higher
NOTE Confidence: 0.9797515

00:05:57.505 --> 00:05:58.005 than,
NOTE Confidence: 0.88904417

00:05:58.464 --> 00:05:58.705 than,
NOTE Confidence: 0.9933208

00:05:59.580 --> 00:06:01.600 people using alcohol daily.
NOTE Confidence: 0.9953861

00:06:01.980 --> 00:06:03.580 So that's where cannabis has
NOTE Confidence: 0.9953861

00:06:03.580 --> 00:06:04.080 gone.
NOTE Confidence: 0.93190855

00:06:04.620 --> 00:06:05.660 And one of the things
NOTE Confidence: 0.93190855

00:06:05.660 --> 00:06:06.460 that we have seen if

NOTE Confidence: 0.93190855

00:06:06.460 --> 00:06:07.360 we take, for example,

NOTE Confidence: 0.8902055

00:06:08.060 --> 00:06:09.600 a state that legalized cannabis

NOTE Confidence: 0.8902055

00:06:09.740 --> 00:06:10.720 early, for example,

NOTE Confidence: 0.88795316

00:06:11.354 --> 00:06:12.634 California, I was gonna say,

NOTE Confidence: 0.88795316

00:06:12.634 --> 00:06:13.835 Canada, which will barely be

NOTE Confidence: 0.88795316

00:06:13.835 --> 00:06:15.755 certain people want it. Cannabis

NOTE Confidence: 0.88795316

00:06:15.755 --> 00:06:17.595 used during early pregnancy, we

NOTE Confidence: 0.88795316

00:06:17.595 --> 00:06:20.014 saw that when the recreational,

NOTE Confidence: 0.9421416

00:06:21.595 --> 00:06:23.820 cannabis legalization occurred and was

NOTE Confidence: 0.9421416

00:06:23.820 --> 00:06:25.260 implemented, you see now that

NOTE Confidence: 0.9421416

00:06:25.260 --> 00:06:26.540 there is even a a

NOTE Confidence: 0.9421416

00:06:26.540 --> 00:06:27.580 a bigger jump up in

NOTE Confidence: 0.9421416

00:06:27.580 --> 00:06:29.580 terms of pregnant women using

NOTE Confidence: 0.9421416

00:06:29.580 --> 00:06:31.260 cannabis. And it's mainly in

NOTE Confidence: 0.9421416

00:06:31.339 --> 00:06:32.720 within even can California,

NOTE Confidence: 0.89955616

00:06:34.139 --> 00:06:36.060 those places where their the
NOTE Confidence: 0.89955616

00:06:36.060 --> 00:06:36.560 retail
NOTE Confidence: 0.8543122

00:06:37.555 --> 00:06:38.055 sales,
NOTE Confidence: 0.9718252

00:06:38.675 --> 00:06:40.435 are allowed, that's what's driving
NOTE Confidence: 0.9718252

00:06:40.435 --> 00:06:41.235 a lot of that,
NOTE Confidence: 0.99272144

00:06:41.714 --> 00:06:42.214 use.
NOTE Confidence: 0.9523934

00:06:42.675 --> 00:06:44.675 So for me and, obviously,
NOTE Confidence: 0.9523934

00:06:44.675 --> 00:06:46.214 for for many of you,
NOTE Confidence: 0.9523934

00:06:46.275 --> 00:06:47.335 the issue about,
NOTE Confidence: 0.9812446

00:06:48.914 --> 00:06:51.074 cannabis per se is the
NOTE Confidence: 0.9812446

00:06:51.074 --> 00:06:52.694 aspect of addiction risk.
NOTE Confidence: 0.9396639

00:06:53.170 --> 00:06:54.930 But we studied often along
NOTE Confidence: 0.9396639

00:06:54.930 --> 00:06:56.690 with the psychiatric risk of,
NOTE Confidence: 0.86925673

00:06:58.050 --> 00:06:59.730 the psychiatric disorders. We studied
NOTE Confidence: 0.86925673

00:06:59.730 --> 00:07:00.870 them mainly in adulthood.
NOTE Confidence: 0.9549349

00:07:01.330 --> 00:07:02.370 But we know that there's

NOTE Confidence: 0.9549349
00:07:02.370 --> 00:07:04.290 a developmental origin to most
NOTE Confidence: 0.9549349
00:07:04.290 --> 00:07:05.585 of them and not just
NOTE Confidence: 0.9549349
00:07:05.585 --> 00:07:06.085 adolescents
NOTE Confidence: 0.9553318
00:07:06.945 --> 00:07:07.445 for,
NOTE Confidence: 0.94260424
00:07:08.145 --> 00:07:09.905 for adult psychiatric and addiction
NOTE Confidence: 0.94260424
00:07:09.905 --> 00:07:11.745 risk, but also in regard
NOTE Confidence: 0.94260424
00:07:11.745 --> 00:07:13.525 to understanding even prenatal.
NOTE Confidence: 0.95148957
00:07:13.905 --> 00:07:15.585 And cannabis is an important
NOTE Confidence: 0.95148957
00:07:15.585 --> 00:07:16.785 part of that because of
NOTE Confidence: 0.95148957
00:07:16.785 --> 00:07:17.905 the numbers I just showed
NOTE Confidence: 0.95148957
00:07:17.905 --> 00:07:19.590 you that more women pregnant
NOTE Confidence: 0.95148957
00:07:19.590 --> 00:07:21.510 women are using cannabis that
NOTE Confidence: 0.9642861
00:07:22.310 --> 00:07:23.030 I didn't show you the
NOTE Confidence: 0.9642861
00:07:23.030 --> 00:07:24.390 numbers, but that increase in
NOTE Confidence: 0.9642861
00:07:24.390 --> 00:07:25.930 the frequency and daily use,
NOTE Confidence: 0.9471964

00:07:26.310 --> 00:07:28.070 were also there in in
NOTE Confidence: 0.9471964

00:07:28.070 --> 00:07:28.570 adolescence.
NOTE Confidence: 0.8867506

00:07:29.430 --> 00:07:31.430 And a major issue for
NOTE Confidence: 0.8867506

00:07:31.430 --> 00:07:32.330 this the
NOTE Confidence: 0.9993704

00:07:32.745 --> 00:07:33.245 concern
NOTE Confidence: 0.99372286

00:07:33.625 --> 00:07:34.125 regarding,
NOTE Confidence: 0.9860883

00:07:35.065 --> 00:07:37.245 the the exposure of cannabis
NOTE Confidence: 0.9860883

00:07:37.305 --> 00:07:38.665 early on is that we
NOTE Confidence: 0.9860883

00:07:38.665 --> 00:07:40.445 know that the endogenous cannabinoid
NOTE Confidence: 0.9860883

00:07:40.585 --> 00:07:41.085 system
NOTE Confidence: 0.9954737

00:07:41.465 --> 00:07:42.905 does play a really critical
NOTE Confidence: 0.9954737

00:07:42.905 --> 00:07:43.405 role,
NOTE Confidence: 0.9725367

00:07:43.945 --> 00:07:45.865 throughout the you know, throughout
NOTE Confidence: 0.9725367

00:07:45.865 --> 00:07:48.180 life, but especially during early
NOTE Confidence: 0.9725367

00:07:48.180 --> 00:07:49.620 development in terms of not
NOTE Confidence: 0.9725367

00:07:49.620 --> 00:07:51.640 just neurogenesis, but also the

NOTE Confidence: 0.9725367
00:07:51.700 --> 00:07:52.440 the the
NOTE Confidence: 0.9513099
00:07:53.300 --> 00:07:54.580 the birth of of many
NOTE Confidence: 0.9513099
00:07:54.580 --> 00:07:56.260 different types of cells, their
NOTE Confidence: 0.9513099
00:07:56.260 --> 00:07:58.280 migration, the synapses that they
NOTE Confidence: 0.9513099
00:07:58.340 --> 00:08:00.180 form, and even program cell
NOTE Confidence: 0.9513099
00:08:00.180 --> 00:08:00.680 death.
NOTE Confidence: 0.97034997
00:08:01.315 --> 00:08:02.515 And and later on, in
NOTE Confidence: 0.97034997
00:08:02.515 --> 00:08:03.655 terms of late adulthood
NOTE Confidence: 0.8514568
00:08:04.515 --> 00:08:06.275 sorry. Late adolescence into early
NOTE Confidence: 0.8514568
00:08:06.275 --> 00:08:06.775 adulthood,
NOTE Confidence: 0.99628127
00:08:07.155 --> 00:08:09.015 the fine tuning and maturation
NOTE Confidence: 0.95232946
00:08:09.795 --> 00:08:11.095 of the of the cortex,
NOTE Confidence: 0.99950135
00:08:11.555 --> 00:08:13.095 a lot of the endocannabinoid
NOTE Confidence: 0.9862595
00:08:13.555 --> 00:08:14.915 system is critical in the
NOTE Confidence: 0.9862595
00:08:15.075 --> 00:08:16.455 in these, processes.
NOTE Confidence: 0.9945876

00:08:16.939 --> 00:08:18.060 And as I said, we
NOTE Confidence: 0.9945876

00:08:18.060 --> 00:08:20.159 know that there's more exposure
NOTE Confidence: 0.9995116

00:08:20.780 --> 00:08:21.520 to cannabis
NOTE Confidence: 0.99057645

00:08:21.979 --> 00:08:23.099 in during these,
NOTE Confidence: 0.9972291

00:08:23.580 --> 00:08:24.879 important key developmental
NOTE Confidence: 0.96642184

00:08:25.180 --> 00:08:25.680 stages,
NOTE Confidence: 0.9116411

00:08:26.139 --> 00:08:27.120 not just adolescence,
NOTE Confidence: 0.8830311

00:08:27.500 --> 00:08:28.639 but, throughout,
NOTE Confidence: 0.9891731

00:08:29.099 --> 00:08:30.240 from fetal infancy,
NOTE Confidence: 0.97784317

00:08:30.694 --> 00:08:32.214 childhood, and so on. So
NOTE Confidence: 0.97784317

00:08:32.214 --> 00:08:33.095 this is one of the
NOTE Confidence: 0.97784317

00:08:33.095 --> 00:08:34.054 things that you know, the
NOTE Confidence: 0.97784317

00:08:34.054 --> 00:08:35.334 question is, what are the
NOTE Confidence: 0.97784317

00:08:35.334 --> 00:08:36.795 lit the long term impact
NOTE Confidence: 0.97784317

00:08:36.934 --> 00:08:38.554 on on behavior?
NOTE Confidence: 0.96593606

00:08:39.175 --> 00:08:41.015 And when we look at

NOTE Confidence: 0.96593606
00:08:41.015 --> 00:08:42.154 where does THC,
NOTE Confidence: 0.9113064
00:08:42.850 --> 00:08:45.110 the cannabinoid that leads to
NOTE Confidence: 0.9113064
00:08:45.170 --> 00:08:47.170 the, you know, the reinforcing
NOTE Confidence: 0.9113064
00:08:47.170 --> 00:08:48.710 effects and even obviously,
NOTE Confidence: 0.90479547
00:08:49.330 --> 00:08:50.530 at Yale shown, you know,
NOTE Confidence: 0.90479547
00:08:50.530 --> 00:08:51.730 its importance for,
NOTE Confidence: 0.99660164
00:08:52.530 --> 00:08:54.150 for the psychosis that
NOTE Confidence: 0.96776336
00:08:54.530 --> 00:08:56.470 acute cannabis use can induce.
NOTE Confidence: 0.96776336
00:08:56.765 --> 00:08:57.645 We know that it binds
NOTE Confidence: 0.96776336
00:08:57.645 --> 00:08:58.945 to the cannabinoid receptor,
NOTE Confidence: 0.93687445
00:08:59.325 --> 00:09:00.845 the CB one receptor, which
NOTE Confidence: 0.93687445
00:09:00.845 --> 00:09:02.684 is the most abundant key
NOTE Confidence: 0.93687445
00:09:02.684 --> 00:09:04.125 protein coupled receptor in the
NOTE Confidence: 0.93687445
00:09:04.125 --> 00:09:05.825 brain. So it's highly abundant
NOTE Confidence: 0.93687445
00:09:05.965 --> 00:09:06.925 throughout most,
NOTE Confidence: 0.9930054

00:09:07.404 --> 00:09:08.225 brain regions.
NOTE Confidence: 0.99291646

00:09:09.029 --> 00:09:09.910 But when you look in
NOTE Confidence: 0.99291646

00:09:09.910 --> 00:09:12.490 the, the fetal developing brain,
NOTE Confidence: 0.9453711

00:09:13.190 --> 00:09:14.709 there is a developmental process
NOTE Confidence: 0.9453711

00:09:14.709 --> 00:09:16.149 which we would expect. But
NOTE Confidence: 0.9453711

00:09:16.149 --> 00:09:17.029 you do see that the
NOTE Confidence: 0.9453711

00:09:17.029 --> 00:09:18.170 cannabinoid receptor
NOTE Confidence: 0.9996623

00:09:19.110 --> 00:09:20.730 is expressed very highly
NOTE Confidence: 0.9354307

00:09:21.204 --> 00:09:22.904 in, for example, the amygdala,
NOTE Confidence: 0.9354307

00:09:23.125 --> 00:09:25.045 brain region, really critical for
NOTE Confidence: 0.9354307

00:09:25.045 --> 00:09:26.024 emotional regulation,
NOTE Confidence: 0.9552386

00:09:26.565 --> 00:09:27.524 not on this slide, but
NOTE Confidence: 0.9552386

00:09:27.524 --> 00:09:29.365 in the nucleus accumbens, importance
NOTE Confidence: 0.9552386

00:09:29.365 --> 00:09:31.045 reward, goal directed behavior, and
NOTE Confidence: 0.9552386

00:09:31.045 --> 00:09:32.725 so on. So we know
NOTE Confidence: 0.9552386

00:09:32.725 --> 00:09:34.105 from very early on

NOTE Confidence: 0.99948245

00:09:34.460 --> 00:09:35.600 that the endocannabinoid

NOTE Confidence: 0.96859634

00:09:36.059 --> 00:09:38.220 system and, therefore, exposure to

NOTE Confidence: 0.96859634

00:09:38.220 --> 00:09:39.740 cannabis and cannabinoids during this

NOTE Confidence: 0.96859634

00:09:39.740 --> 00:09:41.340 time period might have important

NOTE Confidence: 0.96859634

00:09:41.340 --> 00:09:41.840 implications

NOTE Confidence: 0.99169314

00:09:42.220 --> 00:09:43.280 relevant to,

NOTE Confidence: 0.99873835

00:09:43.980 --> 00:09:45.200 mental health risk.

NOTE Confidence: 0.98193526

00:09:45.660 --> 00:09:47.980 And so when we look

NOTE Confidence: 0.98193526

00:09:47.980 --> 00:09:50.434 at I'm gonna I've separated

NOTE Confidence: 0.98193526

00:09:50.495 --> 00:09:51.535 the the talk in two

NOTE Confidence: 0.98193526

00:09:51.535 --> 00:09:53.855 parts, focusing first on the

NOTE Confidence: 0.98193526

00:09:54.095 --> 00:09:56.015 on fetal development, and then

NOTE Confidence: 0.98193526

00:09:56.015 --> 00:09:57.954 I'll go to adolescent exposure,

NOTE Confidence: 0.9902415

00:09:58.654 --> 00:10:00.434 to, cannabis and cannabinoids.

NOTE Confidence: 0.91921103

00:10:01.250 --> 00:10:02.470 So as I said,

NOTE Confidence: 0.9388809

00:10:03.010 --> 00:10:04.690 the endocannabinoid system plays a

NOTE Confidence: 0.9388809

00:10:04.690 --> 00:10:06.209 really critical role doing this

NOTE Confidence: 0.9388809

00:10:06.209 --> 00:10:07.589 early developmental processes

NOTE Confidence: 0.94948107

00:10:08.050 --> 00:10:09.889 where the oh, that was

NOTE Confidence: 0.94948107

00:10:09.889 --> 00:10:11.410 still did I go back?

NOTE Confidence: 0.94948107

00:10:11.410 --> 00:10:13.410 Where, there is a huge

NOTE Confidence: 0.94948107

00:10:13.410 --> 00:10:14.389 dynamic change

NOTE Confidence: 0.99978167

00:10:15.095 --> 00:10:16.315 in the endocannabinoid

NOTE Confidence: 0.99223566

00:10:16.695 --> 00:10:18.235 system during this time period.

NOTE Confidence: 0.99223566

00:10:18.375 --> 00:10:19.575 So a big question for

NOTE Confidence: 0.99223566

00:10:19.575 --> 00:10:21.815 us was, does early exposure

NOTE Confidence: 0.99223566

00:10:21.815 --> 00:10:22.555 during prenatal

NOTE Confidence: 0.93749

00:10:23.095 --> 00:10:24.615 exposure, does that have a

NOTE Confidence: 0.93749

00:10:24.615 --> 00:10:26.455 long term impact on on

NOTE Confidence: 0.93749

00:10:26.455 --> 00:10:27.195 on future,

NOTE Confidence: 0.9885261

00:10:27.575 --> 00:10:28.635 offspring development?

NOTE Confidence: 0.9968117
00:10:29.309 --> 00:10:31.470 And this project actually became
NOTE Confidence: 0.9968117
00:10:31.470 --> 00:10:32.210 much more,
NOTE Confidence: 0.80822057
00:10:34.350 --> 00:10:35.250 I will say,
NOTE Confidence: 0.9792514
00:10:35.790 --> 00:10:37.070 real because we wanted to
NOTE Confidence: 0.9792514
00:10:37.070 --> 00:10:38.110 really get a sense of
NOTE Confidence: 0.9792514
00:10:38.110 --> 00:10:40.270 what's happening in humans. And
NOTE Confidence: 0.9792514
00:10:40.270 --> 00:10:42.030 so my colleague, Yoko Nomura,
NOTE Confidence: 0.9792514
00:10:42.030 --> 00:10:43.070 at that time was studying
NOTE Confidence: 0.9792514
00:10:43.070 --> 00:10:44.670 stress during pregnancy and looking
NOTE Confidence: 0.9792514
00:10:44.670 --> 00:10:44.955 at
NOTE Confidence: 0.8871609
00:10:45.515 --> 00:10:46.015 offspring,
NOTE Confidence: 0.90780026
00:10:47.035 --> 00:10:48.155 behavior, and they wanted to
NOTE Confidence: 0.90780026
00:10:48.155 --> 00:10:49.755 study cannabis. And so we
NOTE Confidence: 0.90780026
00:10:49.755 --> 00:10:50.815 combined our efforts.
NOTE Confidence: 0.9962312
00:10:51.195 --> 00:10:52.315 And one of the things
NOTE Confidence: 0.9962312

00:10:52.315 --> 00:10:54.015 that we were able to,
NOTE Confidence: 0.98874664

00:10:55.195 --> 00:10:56.495 to actually centralize
NOTE Confidence: 0.92628825

00:10:56.795 --> 00:10:58.475 from the stress perspective, because
NOTE Confidence: 0.92628825

00:10:58.475 --> 00:10:59.215 many pregnant,
NOTE Confidence: 0.96141106

00:10:59.670 --> 00:11:01.110 women will have different stressors.
NOTE Confidence: 0.96141106

00:11:01.110 --> 00:11:02.410 But there was an objective
NOTE Confidence: 0.96141106

00:11:02.470 --> 00:11:03.929 common stress that all,
NOTE Confidence: 0.90690064

00:11:04.309 --> 00:11:05.510 everybody in our study at
NOTE Confidence: 0.90690064

00:11:05.510 --> 00:11:07.750 that time experienced. Those, obviously,
NOTE Confidence: 0.90690064

00:11:07.750 --> 00:11:09.350 before we were studying people
NOTE Confidence: 0.90690064

00:11:09.350 --> 00:11:11.210 before, superstorm Sandy,
NOTE Confidence: 0.93136674

00:11:11.804 --> 00:11:13.085 around over little over a
NOTE Confidence: 0.93136674

00:11:13.085 --> 00:11:15.245 decade ago now and during
NOTE Confidence: 0.93136674

00:11:15.245 --> 00:11:16.684 and post. And we collected
NOTE Confidence: 0.93136674

00:11:16.684 --> 00:11:18.684 many different things and, studied
NOTE Confidence: 0.93136674

00:11:18.684 --> 00:11:20.145 their kids also afterwards.

NOTE Confidence: 0.9843289
00:11:20.605 --> 00:11:22.365 So the question was, does
NOTE Confidence: 0.97095686
00:11:23.889 --> 00:11:24.850 you know, what can we
NOTE Confidence: 0.97095686
00:11:24.850 --> 00:11:26.290 look at prenatally to be
NOTE Confidence: 0.97095686
00:11:26.290 --> 00:11:27.190 able to understand,
NOTE Confidence: 0.9729492
00:11:27.730 --> 00:11:29.089 what might be an impact
NOTE Confidence: 0.9729492
00:11:29.089 --> 00:11:30.850 of cannabis exposure during in
NOTE Confidence: 0.9729492
00:11:30.850 --> 00:11:31.350 utero,
NOTE Confidence: 0.8571669
00:11:31.889 --> 00:11:32.389 development?
NOTE Confidence: 0.97013646
00:11:32.690 --> 00:11:34.529 And we thought about the
NOTE Confidence: 0.97013646
00:11:34.529 --> 00:11:36.804 placenta. Obviously, you know, considered
NOTE Confidence: 0.97013646
00:11:37.025 --> 00:11:38.304 the third brain, the link
NOTE Confidence: 0.97013646
00:11:38.304 --> 00:11:40.304 between maternal and and and
NOTE Confidence: 0.97013646
00:11:40.304 --> 00:11:42.065 fetal brain. And as all
NOTE Confidence: 0.97013646
00:11:42.065 --> 00:11:43.184 of you know, the placenta
NOTE Confidence: 0.97013646
00:11:43.184 --> 00:11:45.605 is critical for fetal development
NOTE Confidence: 0.97474

00:11:46.065 --> 00:11:48.225 on every single aspect of
NOTE Confidence: 0.97474

00:11:48.225 --> 00:11:49.525 of of fetal development.
NOTE Confidence: 0.9803095

00:11:49.910 --> 00:11:51.510 And, also, studies have shown
NOTE Confidence: 0.9803095

00:11:51.510 --> 00:11:52.890 that placental programming
NOTE Confidence: 0.9803995

00:11:53.270 --> 00:11:54.470 is actually critical for,
NOTE Confidence: 0.9708266

00:11:56.309 --> 00:11:58.410 not just neurodevelopment, but psychiatric
NOTE Confidence: 0.9708266

00:11:58.630 --> 00:12:00.330 risks seen later in life.
NOTE Confidence: 0.9708266

00:12:00.630 --> 00:12:02.525 So we decided to ask
NOTE Confidence: 0.9708266

00:12:02.525 --> 00:12:03.965 the question, does cannabis impact
NOTE Confidence: 0.9708266

00:12:03.965 --> 00:12:06.065 the placental environment? And, therefore,
NOTE Confidence: 0.9708266

00:12:06.205 --> 00:12:07.665 we did RNA sequencing
NOTE Confidence: 0.9794923

00:12:08.125 --> 00:12:08.925 and just to look at
NOTE Confidence: 0.9794923

00:12:08.925 --> 00:12:10.785 the transcriptome of the placenta.
NOTE Confidence: 0.7763986

00:12:11.165 --> 00:12:12.125 And they posted at that
NOTE Confidence: 0.7763986

00:12:12.125 --> 00:12:13.645 time with Greg Rompala. We
NOTE Confidence: 0.7763986

00:12:13.645 --> 00:12:14.625 could see that,

NOTE Confidence: 0.97820514
00:12:15.240 --> 00:12:17.000 for example, candidate genes like
NOTE Confidence: 0.97820514
00:12:17.000 --> 00:12:19.320 the cannabinoid receptor gene was
NOTE Confidence: 0.97820514
00:12:19.320 --> 00:12:19.820 significantly
NOTE Confidence: 0.9557483
00:12:20.280 --> 00:12:22.780 impacted with maternal cannabis use
NOTE Confidence: 0.9557483
00:12:23.080 --> 00:12:24.940 and was, and even correlated
NOTE Confidence: 0.9557483
00:12:25.000 --> 00:12:26.200 to the amount of use
NOTE Confidence: 0.9557483
00:12:26.200 --> 00:12:27.559 that they the the women
NOTE Confidence: 0.9557483
00:12:27.559 --> 00:12:28.460 reported using.
NOTE Confidence: 0.9983051
00:12:29.080 --> 00:12:30.220 But what we were
NOTE Confidence: 0.991378
00:12:30.945 --> 00:12:32.725 surprised about, at least initially,
NOTE Confidence: 0.99939376
00:12:33.265 --> 00:12:34.385 was that there was this
NOTE Confidence: 0.99939376
00:12:34.385 --> 00:12:35.205 really strong
NOTE Confidence: 0.9973305
00:12:35.985 --> 00:12:38.145 dysregulation of immune related genes
NOTE Confidence: 0.9973305
00:12:38.145 --> 00:12:39.825 in the placenta. No matter
NOTE Confidence: 0.9973305
00:12:39.825 --> 00:12:40.325 how,
NOTE Confidence: 0.99744445

00:12:40.705 --> 00:12:42.385 the data was analyzed, we
NOTE Confidence: 0.99744445

00:12:42.385 --> 00:12:43.745 could see that this had
NOTE Confidence: 0.99744445

00:12:43.745 --> 00:12:45.045 a really strong effect.
NOTE Confidence: 0.9434313

00:12:45.350 --> 00:12:47.270 We then have replicated in
NOTE Confidence: 0.9434313

00:12:47.270 --> 00:12:49.270 a subgroup again, and here
NOTE Confidence: 0.9434313

00:12:49.270 --> 00:12:50.230 trying to see if there
NOTE Confidence: 0.9434313

00:12:50.230 --> 00:12:51.270 are any differences in the
NOTE Confidence: 0.9434313

00:12:51.270 --> 00:12:52.150 sex. And one of the
NOTE Confidence: 0.9434313

00:12:52.150 --> 00:12:53.350 things that we could see,
NOTE Confidence: 0.9434313

00:12:53.350 --> 00:12:54.870 well, there are significant sex
NOTE Confidence: 0.9434313

00:12:54.870 --> 00:12:55.370 differences
NOTE Confidence: 0.99761033

00:12:55.830 --> 00:12:57.610 in regard to the placental
NOTE Confidence: 0.99761033

00:12:57.670 --> 00:12:58.170 transcriptome
NOTE Confidence: 0.9935163

00:12:58.545 --> 00:12:59.665 that it was males that
NOTE Confidence: 0.9935163

00:12:59.665 --> 00:13:01.425 were driving a lot of
NOTE Confidence: 0.9935163

00:13:01.425 --> 00:13:03.045 these changes that we saw

NOTE Confidence: 0.9935163
00:13:03.184 --> 00:13:04.785 in in the placenta of
NOTE Confidence: 0.9935163
00:13:04.785 --> 00:13:05.684 those exposed,
NOTE Confidence: 0.9979482
00:13:06.065 --> 00:13:08.005 to to to cannabis.
NOTE Confidence: 0.9703819
00:13:08.785 --> 00:13:10.404 We also then,
NOTE Confidence: 0.99889195
00:13:11.105 --> 00:13:12.565 to be able to understand
NOTE Confidence: 0.99889195
00:13:12.865 --> 00:13:14.005 causal relationships
NOTE Confidence: 0.96403533
00:13:14.970 --> 00:13:17.050 to cannabis. We then developed
NOTE Confidence: 0.96403533
00:13:17.050 --> 00:13:19.309 a translational animal model where,
NOTE Confidence: 0.96403533
00:13:19.529 --> 00:13:21.610 pregnant dams are exposed with
NOTE Confidence: 0.96403533
00:13:21.610 --> 00:13:22.750 vapor to THC,
NOTE Confidence: 0.9348354
00:13:23.529 --> 00:13:24.649 and a very small amount
NOTE Confidence: 0.9348354
00:13:24.649 --> 00:13:25.630 of of CBD,
NOTE Confidence: 0.973259
00:13:26.170 --> 00:13:27.290 and also looked at the
NOTE Confidence: 0.973259
00:13:27.290 --> 00:13:29.295 placenta in those animals. And
NOTE Confidence: 0.973259
00:13:29.295 --> 00:13:31.235 it replicated what we see
NOTE Confidence: 0.99970096

00:13:31.615 --> 00:13:32.915 in the human placenta
NOTE Confidence: 0.97878265

00:13:33.295 --> 00:13:35.214 where, once again, there's much
NOTE Confidence: 0.97878265

00:13:35.214 --> 00:13:36.895 stronger effects in the in
NOTE Confidence: 0.97878265

00:13:36.895 --> 00:13:38.335 the male placenta than in
NOTE Confidence: 0.97878265

00:13:38.335 --> 00:13:39.955 the females. And in rodents,
NOTE Confidence: 0.97878265

00:13:40.095 --> 00:13:41.774 the the siblings are next
NOTE Confidence: 0.97878265

00:13:41.774 --> 00:13:43.019 to each other, So it's
NOTE Confidence: 0.97878265

00:13:43.019 --> 00:13:43.519 not,
NOTE Confidence: 0.7099096

00:13:43.899 --> 00:13:44.399 because,
NOTE Confidence: 0.9557374

00:13:45.420 --> 00:13:47.420 rodents have multiple births, and
NOTE Confidence: 0.9557374

00:13:47.420 --> 00:13:48.699 you could see still this
NOTE Confidence: 0.9557374

00:13:48.699 --> 00:13:49.679 this sex difference.
NOTE Confidence: 0.9705884

00:13:50.380 --> 00:13:51.339 One of the things that
NOTE Confidence: 0.9705884

00:13:51.339 --> 00:13:52.699 we saw, again, in terms
NOTE Confidence: 0.9705884

00:13:52.699 --> 00:13:54.300 of, replicating what we saw
NOTE Confidence: 0.9705884

00:13:54.300 --> 00:13:55.500 in the human, was once

NOTE Confidence: 0.9705884
00:13:55.500 --> 00:13:57.759 again these immune related dysregulation
NOTE Confidence: 0.98950034
00:13:58.595 --> 00:14:00.035 of the genes in in
NOTE Confidence: 0.98950034
00:14:00.035 --> 00:14:01.655 the placenta that were exposed,
NOTE Confidence: 0.99531364
00:14:02.195 --> 00:14:03.015 to THC.
NOTE Confidence: 0.96284413
00:14:04.355 --> 00:14:06.035 And we could see also
NOTE Confidence: 0.96284413
00:14:06.035 --> 00:14:07.475 these epigenetic changes that I
NOTE Confidence: 0.96284413
00:14:07.475 --> 00:14:08.835 didn't go into, with the
NOTE Confidence: 0.96284413
00:14:08.835 --> 00:14:10.355 with the human, but I'll
NOTE Confidence: 0.96284413
00:14:10.355 --> 00:14:11.795 go into a little later
NOTE Confidence: 0.96284413
00:14:11.795 --> 00:14:12.755 as well where there are
NOTE Confidence: 0.96284413
00:14:12.755 --> 00:14:13.895 these specific epigenetic
NOTE Confidence: 0.9901018
00:14:14.280 --> 00:14:15.800 dysregulation that we could also
NOTE Confidence: 0.9901018
00:14:15.800 --> 00:14:16.300 see,
NOTE Confidence: 0.96543485
00:14:16.680 --> 00:14:17.500 in the placenta.
NOTE Confidence: 0.95780456
00:14:18.840 --> 00:14:20.120 We also wanted to see,
NOTE Confidence: 0.95780456

00:14:20.120 --> 00:14:21.720 is it only on the
NOTE Confidence: 0.95780456

00:14:21.720 --> 00:14:23.400 gene expression level? Is it
NOTE Confidence: 0.95780456

00:14:23.400 --> 00:14:24.360 also there on the pro
NOTE Confidence: 0.95780456

00:14:24.840 --> 00:14:25.960 the protein level? So we
NOTE Confidence: 0.95780456

00:14:25.960 --> 00:14:27.785 looked at proteomics using the
NOTE Confidence: 0.95780456

00:14:27.785 --> 00:14:28.285 Yale,
NOTE Confidence: 0.93848044

00:14:29.385 --> 00:14:31.225 proteomics core, and we could
NOTE Confidence: 0.93848044

00:14:31.225 --> 00:14:32.605 replicate that indeed
NOTE Confidence: 0.9537499

00:14:32.905 --> 00:14:34.925 that there were significant differences
NOTE Confidence: 0.9537499

00:14:34.985 --> 00:14:36.285 in immune related,
NOTE Confidence: 0.94879115

00:14:37.625 --> 00:14:39.405 proteins. I'm not highlighting them.
NOTE Confidence: 0.94879115

00:14:39.465 --> 00:14:41.190 Not only in the in
NOTE Confidence: 0.94879115

00:14:41.190 --> 00:14:42.630 the human, but also in
NOTE Confidence: 0.94879115

00:14:42.630 --> 00:14:43.290 the rat.
NOTE Confidence: 0.839217

00:14:43.910 --> 00:14:45.910 So definitely both,
NOTE Confidence: 0.9946633

00:14:46.710 --> 00:14:48.250 prenatal cannabis exposure

NOTE Confidence: 0.9532094
00:14:48.870 --> 00:14:50.310 and THC exposure in our
NOTE Confidence: 0.9532094
00:14:50.310 --> 00:14:51.770 animal models replicate.
NOTE Confidence: 0.99926263
00:14:52.790 --> 00:14:53.290 So
NOTE Confidence: 0.94815767
00:14:53.754 --> 00:14:55.754 the question was, okay. You
NOTE Confidence: 0.94815767
00:14:55.754 --> 00:14:57.915 see these placental changes. Do
NOTE Confidence: 0.94815767
00:14:57.915 --> 00:15:00.014 they really influence and impact,
NOTE Confidence: 0.98629594
00:15:00.954 --> 00:15:02.714 the future phenotype of the
NOTE Confidence: 0.98629594
00:15:02.714 --> 00:15:03.214 offspring?
NOTE Confidence: 0.9343761
00:15:03.834 --> 00:15:05.274 And so we had brought
NOTE Confidence: 0.9343761
00:15:05.274 --> 00:15:06.975 back in the kids yearly,
NOTE Confidence: 0.9063136
00:15:08.230 --> 00:15:09.190 for the women who we
NOTE Confidence: 0.9063136
00:15:09.190 --> 00:15:11.050 had, studied while pregnant.
NOTE Confidence: 0.93918455
00:15:11.589 --> 00:15:12.550 And I'll just show a
NOTE Confidence: 0.93918455
00:15:12.550 --> 00:15:13.829 few of of the data.
NOTE Confidence: 0.93918455
00:15:13.829 --> 00:15:14.630 I mean, a lot has
NOTE Confidence: 0.93918455

00:15:14.630 --> 00:15:16.230 happened since then, but I'm
NOTE Confidence: 0.93918455

00:15:16.230 --> 00:15:17.029 just showing a list of
NOTE Confidence: 0.93918455

00:15:17.029 --> 00:15:18.069 the published ones where we
NOTE Confidence: 0.93918455

00:15:18.069 --> 00:15:19.269 could see that, for example,
NOTE Confidence: 0.93918455

00:15:19.269 --> 00:15:21.225 in their hair, steroid hormone
NOTE Confidence: 0.93918455

00:15:21.225 --> 00:15:23.225 cortisol was increased in those
NOTE Confidence: 0.93918455

00:15:23.225 --> 00:15:25.005 who had been exposed prenatally,
NOTE Confidence: 0.99944687

00:15:25.465 --> 00:15:26.125 to cannabis.
NOTE Confidence: 0.9513213

00:15:26.825 --> 00:15:28.045 They have clinical,
NOTE Confidence: 0.92842233

00:15:29.385 --> 00:15:29.885 measures,
NOTE Confidence: 0.9660576

00:15:30.345 --> 00:15:31.485 every year by,
NOTE Confidence: 0.9465559

00:15:32.350 --> 00:15:34.510 psychologists, psychiatrists, and social workers,
NOTE Confidence: 0.9465559

00:15:34.510 --> 00:15:35.810 and we could see that,
NOTE Confidence: 0.9465559

00:15:35.870 --> 00:15:37.870 again, those individuals that had
NOTE Confidence: 0.9465559

00:15:37.870 --> 00:15:39.470 been who had been exposed
NOTE Confidence: 0.9465559

00:15:39.470 --> 00:15:41.550 to cannabis prenatally showed greater

NOTE Confidence: 0.9465559
00:15:41.550 --> 00:15:43.810 anxiety, greater aggression, greater,
NOTE Confidence: 0.9996393
00:15:44.270 --> 00:15:44.770 hyperactivity.
NOTE Confidence: 0.9827954
00:15:46.055 --> 00:15:47.415 We also saw, though, that
NOTE Confidence: 0.9827954
00:15:47.415 --> 00:15:48.154 there is
NOTE Confidence: 0.9474365
00:15:49.014 --> 00:15:50.954 a a really strong synergistic
NOTE Confidence: 0.9995389
00:15:51.334 --> 00:15:54.074 interaction between the prenatal exposure
NOTE Confidence: 0.9995389
00:15:54.295 --> 00:15:55.274 to stress
NOTE Confidence: 0.9866596
00:15:55.815 --> 00:15:57.654 with cannabis. So, yes, you
NOTE Confidence: 0.9866596
00:15:57.654 --> 00:15:59.095 get this increase in anxiety
NOTE Confidence: 0.9866596
00:15:59.095 --> 00:16:01.175 in those exposed to cannabis
NOTE Confidence: 0.9866596
00:16:01.175 --> 00:16:02.850 and stress, But the the
NOTE Confidence: 0.9866596
00:16:03.070 --> 00:16:04.830 combination of both in their
NOTE Confidence: 0.9866596
00:16:04.830 --> 00:16:05.330 offspring
NOTE Confidence: 0.8987047
00:16:05.870 --> 00:16:06.990 led to a much of
NOTE Confidence: 0.8987047
00:16:06.990 --> 00:16:08.050 this huge synergistic,
NOTE Confidence: 0.9841272

00:16:08.590 --> 00:16:09.090 effect
NOTE Confidence: 0.97450113

00:16:09.470 --> 00:16:09.970 that,
NOTE Confidence: 0.9920855

00:16:10.510 --> 00:16:12.270 even the earlier onset of
NOTE Confidence: 0.9920855

00:16:12.270 --> 00:16:12.930 the diagnosis,
NOTE Confidence: 0.96520394

00:16:13.630 --> 00:16:15.635 not just in the the,
NOTE Confidence: 0.9950379

00:16:16.095 --> 00:16:16.755 the magnitude
NOTE Confidence: 0.9949876

00:16:17.215 --> 00:16:19.235 of their their behavioral differences.
NOTE Confidence: 0.9763907

00:16:20.175 --> 00:16:22.575 So synergistic effects are really
NOTE Confidence: 0.9763907

00:16:22.575 --> 00:16:23.935 critical, and I think that
NOTE Confidence: 0.9763907

00:16:23.935 --> 00:16:25.535 also plays into I'm not
NOTE Confidence: 0.9763907

00:16:25.535 --> 00:16:26.915 gonna talk about the environmental
NOTE Confidence: 0.9763907

00:16:26.975 --> 00:16:28.175 factors that we also have
NOTE Confidence: 0.9763907

00:16:28.175 --> 00:16:28.835 to consider.
NOTE Confidence: 0.917015

00:16:29.670 --> 00:16:30.790 But one of the things
NOTE Confidence: 0.917015

00:16:30.790 --> 00:16:31.750 that that said what we
NOTE Confidence: 0.917015

00:16:31.750 --> 00:16:33.750 were interested in is does

NOTE Confidence: 0.917015
00:16:33.750 --> 00:16:34.570 early life
NOTE Confidence: 0.9995363
00:16:35.029 --> 00:16:35.529 events
NOTE Confidence: 0.8710063
00:16:35.910 --> 00:16:36.649 and that we
NOTE Confidence: 0.9513752
00:16:36.950 --> 00:16:39.210 use the placental gene, transcriptome,
NOTE Confidence: 0.9638757
00:16:39.830 --> 00:16:41.430 does it really predict future
NOTE Confidence: 0.9638757
00:16:41.430 --> 00:16:42.630 behavior? And we could see
NOTE Confidence: 0.9638757
00:16:42.630 --> 00:16:44.730 that, indeed, that
NOTE Confidence: 0.912571
00:16:45.824 --> 00:16:48.084 off the placental transcriptome,
NOTE Confidence: 0.9336613
00:16:48.545 --> 00:16:50.884 the cytokine, the immune related,
NOTE Confidence: 0.9966335
00:16:51.824 --> 00:16:52.725 gene networks
NOTE Confidence: 0.9659165
00:16:53.105 --> 00:16:53.925 really predicted
NOTE Confidence: 0.9583206
00:16:54.384 --> 00:16:56.964 anxiety behavior in the offspring
NOTE Confidence: 0.9583206
00:16:57.185 --> 00:16:58.910 of those women who had
NOTE Confidence: 0.9583206
00:16:58.910 --> 00:17:01.410 been abused cannabis during pregnancy,
NOTE Confidence: 0.98042446
00:17:02.510 --> 00:17:03.630 and we did not see
NOTE Confidence: 0.98042446

00:17:03.630 --> 00:17:05.550 a relationship in those who,
NOTE Confidence: 0.98042446

00:17:05.950 --> 00:17:07.250 in the control subjects.
NOTE Confidence: 0.9561774

00:17:07.950 --> 00:17:09.869 We've, as I said, studied
NOTE Confidence: 0.9561774

00:17:09.869 --> 00:17:11.470 a subgroup of individuals, and
NOTE Confidence: 0.9561774

00:17:11.470 --> 00:17:12.850 we once again see
NOTE Confidence: 0.9754899

00:17:13.795 --> 00:17:15.875 that, the relationship of the
NOTE Confidence: 0.9754899

00:17:15.875 --> 00:17:16.375 immune,
NOTE Confidence: 0.98065853

00:17:16.915 --> 00:17:18.855 related placental gene expression,
NOTE Confidence: 0.9924896

00:17:20.035 --> 00:17:22.035 are associated with anxiety later
NOTE Confidence: 0.9924896

00:17:22.035 --> 00:17:23.555 on in their their kids.
NOTE Confidence: 0.9924896

00:17:23.555 --> 00:17:25.015 But we also see that
NOTE Confidence: 0.97312355

00:17:25.350 --> 00:17:27.270 those gene networks related to,
NOTE Confidence: 0.97312355

00:17:27.270 --> 00:17:28.970 for example, lipid processing,
NOTE Confidence: 0.9543821

00:17:30.549 --> 00:17:31.929 are really critical,
NOTE Confidence: 0.9947079

00:17:32.390 --> 00:17:33.450 and are so significantly
NOTE Confidence: 0.9762652

00:17:33.750 --> 00:17:35.770 associated with depression,

NOTE Confidence: 0.99881905
00:17:36.390 --> 00:17:36.890 behaviors
NOTE Confidence: 0.9974114
00:17:37.270 --> 00:17:38.570 in the in the offspring.
NOTE Confidence: 0.9992355
00:17:40.575 --> 00:17:41.075 So
NOTE Confidence: 0.96572244
00:17:41.855 --> 00:17:43.234 we see this in children,
NOTE Confidence: 0.96572244
00:17:43.295 --> 00:17:44.195 and so now,
NOTE Confidence: 0.9633545
00:17:44.815 --> 00:17:46.655 we are started looking in
NOTE Confidence: 0.9633545
00:17:46.655 --> 00:17:48.335 our animal models because when
NOTE Confidence: 0.9633545
00:17:48.335 --> 00:17:49.375 we first started looking at
NOTE Confidence: 0.9633545
00:17:49.375 --> 00:17:50.994 the prenatal effects of cannabis,
NOTE Confidence: 0.9633545
00:17:51.135 --> 00:17:51.795 we actually,
NOTE Confidence: 0.8478613
00:17:53.040 --> 00:17:53.860 looked immediately
NOTE Confidence: 0.9412961
00:17:54.320 --> 00:17:55.060 in adulthood.
NOTE Confidence: 0.9662951
00:17:55.360 --> 00:17:56.720 But our human studies told
NOTE Confidence: 0.9662951
00:17:56.720 --> 00:17:58.340 us that there may be,
NOTE Confidence: 0.9328454
00:17:59.760 --> 00:18:01.540 indices earlier in life,
NOTE Confidence: 0.9909815

00:18:01.840 --> 00:18:02.900 even from infancy.
NOTE Confidence: 0.9783787

00:18:03.360 --> 00:18:04.800 So we've started now to
NOTE Confidence: 0.9783787

00:18:04.800 --> 00:18:06.160 look in our animal models
NOTE Confidence: 0.9783787

00:18:06.240 --> 00:18:07.360 using our animal models to
NOTE Confidence: 0.9783787

00:18:07.360 --> 00:18:08.100 look at prenatal,
NOTE Confidence: 0.93122536

00:18:08.945 --> 00:18:10.705 THC exposure and looking at
NOTE Confidence: 0.93122536

00:18:10.705 --> 00:18:11.685 earlier outcomes.
NOTE Confidence: 0.9823151

00:18:12.225 --> 00:18:12.725 And,
NOTE Confidence: 0.9536955

00:18:13.425 --> 00:18:14.385 one of the things that
NOTE Confidence: 0.9536955

00:18:14.385 --> 00:18:15.665 we could see, for example,
NOTE Confidence: 0.9536955

00:18:15.665 --> 00:18:16.705 one of the first measures
NOTE Confidence: 0.9536955

00:18:16.705 --> 00:18:18.065 that you could have in
NOTE Confidence: 0.9536955

00:18:18.065 --> 00:18:18.565 rodents,
NOTE Confidence: 0.90199864

00:18:19.425 --> 00:18:20.785 as a the postnatal late
NOTE Confidence: 0.90199864

00:18:20.785 --> 00:18:22.165 ten in terms of ultrasonic
NOTE Confidence: 0.90199864

00:18:22.305 --> 00:18:24.090 vocalization, how they communicate with

NOTE Confidence: 0.90199864
00:18:24.090 --> 00:18:25.210 their moms. And we could
NOTE Confidence: 0.90199864
00:18:25.210 --> 00:18:26.090 see that there was a
NOTE Confidence: 0.90199864
00:18:26.090 --> 00:18:27.150 significant difference,
NOTE Confidence: 0.8668218
00:18:27.929 --> 00:18:29.470 sorry, significant difference
NOTE Confidence: 0.9962169
00:18:29.850 --> 00:18:30.970 in in the calls that
NOTE Confidence: 0.9962169
00:18:30.970 --> 00:18:32.830 are made in the infant
NOTE Confidence: 0.92063296
00:18:33.369 --> 00:18:34.590 THC exposed,
NOTE Confidence: 0.8885749
00:18:35.609 --> 00:18:37.309 pups as compared to vehicle.
NOTE Confidence: 0.956558
00:18:37.795 --> 00:18:39.955 And these altered communication patterns
NOTE Confidence: 0.956558
00:18:39.955 --> 00:18:41.655 we're still, looking into.
NOTE Confidence: 0.98578197
00:18:42.195 --> 00:18:43.234 A little later on in
NOTE Confidence: 0.98578197
00:18:43.234 --> 00:18:44.935 infancy, we can see that,
NOTE Confidence: 0.96479434
00:18:45.555 --> 00:18:46.055 we
NOTE Confidence: 0.79422355
00:18:46.835 --> 00:18:47.975 these animals underwent
NOTE Confidence: 0.9174381
00:18:48.435 --> 00:18:50.435 a a homing behavioral test
NOTE Confidence: 0.9174381

00:18:50.435 --> 00:18:51.895 for looking at social discrimination.

NOTE Confidence: 0.9174381

00:18:52.035 --> 00:18:53.840 And then we measured, looked

NOTE Confidence: 0.9839156

00:18:54.779 --> 00:18:56.220 at plasma levels the next

NOTE Confidence: 0.9839156

00:18:56.220 --> 00:18:56.940 day, and we could see

NOTE Confidence: 0.9839156

00:18:56.940 --> 00:18:57.840 that the circulating

NOTE Confidence: 0.9388671

00:18:58.700 --> 00:19:00.000 cytokines, these immune

NOTE Confidence: 0.6388677

00:19:00.539 --> 00:19:01.039 changes

NOTE Confidence: 0.8346899

00:19:01.340 --> 00:19:02.559 were were significantly

NOTE Confidence: 0.99880135

00:19:02.859 --> 00:19:04.400 different in the males

NOTE Confidence: 0.9623635

00:19:04.859 --> 00:19:05.359 now

NOTE Confidence: 0.9911662

00:19:06.725 --> 00:19:08.244 a day later after this

NOTE Confidence: 0.9911662

00:19:08.244 --> 00:19:09.145 homing behavior.

NOTE Confidence: 0.96539795

00:19:09.605 --> 00:19:10.965 And, again, we could see

NOTE Confidence: 0.96539795

00:19:10.965 --> 00:19:11.945 that there were,

NOTE Confidence: 0.9995307

00:19:12.725 --> 00:19:13.225 relationships

NOTE Confidence: 0.7908778

00:19:13.685 --> 00:19:14.265 with the

NOTE Confidence: 0.93789095
00:19:17.045 --> 00:19:18.805 an immune related gene expression,
NOTE Confidence: 0.93789095
00:19:18.805 --> 00:19:20.460 NF kappa b, and the
NOTE Confidence: 0.93789095
00:19:20.460 --> 00:19:20.960 circulating
NOTE Confidence: 0.99056673
00:19:21.260 --> 00:19:23.600 cytokines that was completely disrupted
NOTE Confidence: 0.9895694
00:19:24.220 --> 00:19:24.619 in,
NOTE Confidence: 0.9762871
00:19:25.020 --> 00:19:25.980 in the animals that have
NOTE Confidence: 0.9762871
00:19:25.980 --> 00:19:27.660 been prenatally exposed to to
NOTE Confidence: 0.9762871
00:19:27.660 --> 00:19:28.160 THC.
NOTE Confidence: 0.9919618
00:19:29.260 --> 00:19:30.559 And when they get into
NOTE Confidence: 0.9919618
00:19:30.619 --> 00:19:32.540 adolescence, we once again see
NOTE Confidence: 0.9919618
00:19:32.540 --> 00:19:33.580 that there are
NOTE Confidence: 0.9986292
00:19:35.044 --> 00:19:35.544 Sorry.
NOTE Confidence: 0.9772179
00:19:35.845 --> 00:19:37.125 We once again see that
NOTE Confidence: 0.9772179
00:19:37.125 --> 00:19:38.804 there are differences, but, again,
NOTE Confidence: 0.9772179
00:19:38.804 --> 00:19:40.164 there's a sex difference where
NOTE Confidence: 0.9772179

00:19:40.164 --> 00:19:41.765 males that were exposed prenatal

NOTE Confidence: 0.9772179

00:19:41.765 --> 00:19:42.424 to THC

NOTE Confidence: 0.9197448

00:19:42.804 --> 00:19:44.565 showed these really strong differences

NOTE Confidence: 0.9197448

00:19:44.565 --> 00:19:46.505 in, for example, social play.

NOTE Confidence: 0.99642766

00:19:47.220 --> 00:19:49.299 So from even infancy and

NOTE Confidence: 0.99642766

00:19:49.299 --> 00:19:51.059 into adolescence, you can see

NOTE Confidence: 0.99642766

00:19:51.059 --> 00:19:52.679 that there are significant,

NOTE Confidence: 0.9973919

00:19:53.380 --> 00:19:54.600 effects on behavior.

NOTE Confidence: 0.86616737

00:19:55.140 --> 00:19:56.419 But in adulthood, this was

NOTE Confidence: 0.86616737

00:19:56.419 --> 00:19:57.940 from our earlier study earliest

NOTE Confidence: 0.86616737

00:19:57.940 --> 00:19:58.820 studies, and so I was

NOTE Confidence: 0.86616737

00:19:58.820 --> 00:19:59.720 showing because

NOTE Confidence: 0.9524134

00:20:00.100 --> 00:20:01.244 we wanted to look at,

NOTE Confidence: 0.9524134

00:20:01.484 --> 00:20:03.165 is there an impact or

NOTE Confidence: 0.9524134

00:20:03.165 --> 00:20:04.305 relevance to,

NOTE Confidence: 0.76262236

00:20:05.244 --> 00:20:06.785 adult behaviors and particularly

NOTE Confidence: 0.7948792
00:20:07.325 --> 00:20:07.825 people
NOTE Confidence: 0.9663028
00:20:08.125 --> 00:20:09.244 at that time, we're talking
NOTE Confidence: 0.9663028
00:20:09.244 --> 00:20:10.225 about, like, gateway
NOTE Confidence: 0.9008395
00:20:10.525 --> 00:20:11.965 in of cannabis, and we
NOTE Confidence: 0.9008395
00:20:11.965 --> 00:20:13.965 could see that animal adult
NOTE Confidence: 0.9008395
00:20:13.965 --> 00:20:15.450 animals that had been exposed
NOTE Confidence: 0.9008395
00:20:15.450 --> 00:20:17.369 prenatally to THC and never
NOTE Confidence: 0.9008395
00:20:17.369 --> 00:20:19.230 had THC exposure again,
NOTE Confidence: 0.9609935
00:20:19.530 --> 00:20:20.669 if when they were,
NOTE Confidence: 0.99189615
00:20:21.130 --> 00:20:22.809 could choose in terms of
NOTE Confidence: 0.99189615
00:20:22.809 --> 00:20:24.510 the self administration of heroin,
NOTE Confidence: 0.9970945
00:20:24.970 --> 00:20:26.830 they self administered more heroin.
NOTE Confidence: 0.9919553
00:20:27.394 --> 00:20:28.615 And even when we,
NOTE Confidence: 0.97475255
00:20:29.475 --> 00:20:30.994 and they were when we
NOTE Confidence: 0.97475255
00:20:30.994 --> 00:20:32.514 made the situation such that
NOTE Confidence: 0.97475255

00:20:32.514 --> 00:20:33.554 the animals would take the
NOTE Confidence: 0.97475255

00:20:33.554 --> 00:20:34.695 same amount of heroin,
NOTE Confidence: 0.9656529

00:20:36.034 --> 00:20:37.475 those that had those adult
NOTE Confidence: 0.9656529

00:20:37.475 --> 00:20:39.075 animals that had prenatal exposure
NOTE Confidence: 0.9656529

00:20:39.075 --> 00:20:40.115 to THC, they would be
NOTE Confidence: 0.9656529

00:20:40.115 --> 00:20:41.075 the first to run to
NOTE Confidence: 0.9656529

00:20:41.075 --> 00:20:41.955 get the first hit of
NOTE Confidence: 0.9656529

00:20:41.955 --> 00:20:42.455 heroin.
NOTE Confidence: 0.9360232

00:20:42.859 --> 00:20:44.140 And if they were stressed,
NOTE Confidence: 0.9360232

00:20:44.140 --> 00:20:45.900 just mild stress, it increased
NOTE Confidence: 0.9360232

00:20:45.900 --> 00:20:47.520 their heroin seeking behavior.
NOTE Confidence: 0.9668349

00:20:48.140 --> 00:20:49.260 So there were we knew
NOTE Confidence: 0.9668349

00:20:49.260 --> 00:20:50.540 from very long that there
NOTE Confidence: 0.9668349

00:20:50.540 --> 00:20:52.000 was this long term effect
NOTE Confidence: 0.9668349

00:20:52.060 --> 00:20:53.440 of prenatal, cannabis
NOTE Confidence: 0.9214347

00:20:54.060 --> 00:20:55.520 on on behavior,

NOTE Confidence: 0.99569577
00:20:55.984 --> 00:20:57.125 on adult behavior.
NOTE Confidence: 0.9575357
00:20:57.425 --> 00:20:58.865 We could see use looking
NOTE Confidence: 0.9575357
00:20:58.865 --> 00:21:00.965 at other outcomes as well.
NOTE Confidence: 0.9575357
00:21:01.025 --> 00:21:02.785 For example, looking at progressive
NOTE Confidence: 0.9575357
00:21:02.785 --> 00:21:03.765 ratio schedules,
NOTE Confidence: 0.9773903
00:21:04.065 --> 00:21:05.345 whether or not that would
NOTE Confidence: 0.9773903
00:21:05.345 --> 00:21:07.425 look at motivated behavior, we
NOTE Confidence: 0.9773903
00:21:07.425 --> 00:21:08.940 could see that the the
NOTE Confidence: 0.9773903
00:21:08.940 --> 00:21:09.440 prenatal,
NOTE Confidence: 0.891948
00:21:09.820 --> 00:21:10.320 exposed,
NOTE Confidence: 0.9254299
00:21:10.700 --> 00:21:12.460 THC animals showed changes in
NOTE Confidence: 0.9254299
00:21:12.460 --> 00:21:14.539 motivated behavior, changes in in
NOTE Confidence: 0.9254299
00:21:14.539 --> 00:21:16.139 the mobility behavior that looks
NOTE Confidence: 0.9254299
00:21:16.139 --> 00:21:16.380 at,
NOTE Confidence: 0.8958949
00:21:16.940 --> 00:21:18.460 really is a a model
NOTE Confidence: 0.8958949

00:21:18.460 --> 00:21:20.859 of depression like phenotype, and
NOTE Confidence: 0.8958949

00:21:20.859 --> 00:21:22.639 even their hedonic state
NOTE Confidence: 0.9992323

00:21:23.225 --> 00:21:24.905 was changed in relation to
NOTE Confidence: 0.9992323

00:21:24.905 --> 00:21:27.165 stress and their sucrose intake.
NOTE Confidence: 0.9994635

00:21:27.705 --> 00:21:28.205 So
NOTE Confidence: 0.95633227

00:21:29.545 --> 00:21:30.984 for us seeing these long
NOTE Confidence: 0.95633227

00:21:30.984 --> 00:21:32.984 term effects into adulthood, the
NOTE Confidence: 0.95633227

00:21:32.984 --> 00:21:34.105 question was, what are the
NOTE Confidence: 0.95633227

00:21:34.105 --> 00:21:35.970 mechanisms that are maintaining this?
NOTE Confidence: 0.95633227

00:21:36.130 --> 00:21:37.010 And that's when we started
NOTE Confidence: 0.95633227

00:21:37.010 --> 00:21:38.770 to look at epigenetic mechanisms
NOTE Confidence: 0.95633227

00:21:38.770 --> 00:21:40.049 because we know, obviously, we're
NOTE Confidence: 0.95633227

00:21:40.049 --> 00:21:41.750 not changing the genetic,
NOTE Confidence: 0.97020704

00:21:42.289 --> 00:21:43.970 sequence of these animals and
NOTE Confidence: 0.97020704

00:21:43.970 --> 00:21:45.650 that the environment, though, can
NOTE Confidence: 0.97020704

00:21:45.650 --> 00:21:46.150 change,

NOTE Confidence: 0.9117709
00:21:46.770 --> 00:21:48.630 gene activity. And that mechanism
NOTE Confidence: 0.9117709
00:21:48.690 --> 00:21:49.890 by which environment does that
NOTE Confidence: 0.9117709
00:21:49.890 --> 00:21:51.215 through these epigenetic
NOTE Confidence: 0.8186785
00:21:51.755 --> 00:21:53.455 cuts that can increase,
NOTE Confidence: 0.8929808
00:21:54.234 --> 00:21:55.835 open up the the DNA
NOTE Confidence: 0.8929808
00:21:55.835 --> 00:21:57.294 so to increase transcription
NOTE Confidence: 0.989992
00:21:57.755 --> 00:21:59.035 or to close it and
NOTE Confidence: 0.989992
00:21:59.035 --> 00:21:59.934 decrease transcription
NOTE Confidence: 0.9924253
00:22:00.315 --> 00:22:02.255 in selective ways. The epigenetic
NOTE Confidence: 0.9924253
00:22:02.395 --> 00:22:03.535 mechanisms are
NOTE Confidence: 0.9626956
00:22:04.050 --> 00:22:05.830 numerous, and they're growing daily.
NOTE Confidence: 0.98492
00:22:06.290 --> 00:22:08.070 And at that time, we
NOTE Confidence: 0.98492
00:22:08.290 --> 00:22:08.790 then
NOTE Confidence: 0.9428048
00:22:09.170 --> 00:22:10.370 wanted to look at,
NOTE Confidence: 0.989414
00:22:11.890 --> 00:22:12.390 we
NOTE Confidence: 0.9881559

00:22:12.850 --> 00:22:14.130 we looked at the gene
NOTE Confidence: 0.9881559

00:22:14.130 --> 00:22:16.950 expression of known epigenetic mechanisms
NOTE Confidence: 0.9881559

00:22:17.010 --> 00:22:17.990 at that time
NOTE Confidence: 0.96748084

00:22:18.765 --> 00:22:19.965 to to be able to
NOTE Confidence: 0.96748084

00:22:19.965 --> 00:22:21.805 to screen to see were
NOTE Confidence: 0.96748084

00:22:21.805 --> 00:22:23.725 there specific epigenetic changes that
NOTE Confidence: 0.96748084

00:22:23.725 --> 00:22:25.484 were occurring in the brains
NOTE Confidence: 0.96748084

00:22:25.484 --> 00:22:27.085 of animals of adult animals
NOTE Confidence: 0.96748084

00:22:27.085 --> 00:22:29.025 with this prenatal THC exposure.
NOTE Confidence: 0.96748084

00:22:29.165 --> 00:22:29.965 And when we looked at
NOTE Confidence: 0.96748084

00:22:29.965 --> 00:22:30.605 all of these,
NOTE Confidence: 0.99807996

00:22:31.085 --> 00:22:33.720 mechanisms, one was repeated in
NOTE Confidence: 0.8984189

00:22:34.740 --> 00:22:35.460 in all of our,
NOTE Confidence: 0.95558184

00:22:36.020 --> 00:22:37.700 cohorts of our our our
NOTE Confidence: 0.95558184

00:22:37.700 --> 00:22:38.200 animals,
NOTE Confidence: 0.887406

00:22:38.580 --> 00:22:40.020 and that was KMT two

NOTE Confidence: 0.887406
00:22:40.020 --> 00:22:40.980 a, which is also m
NOTE Confidence: 0.887406
00:22:40.980 --> 00:22:42.419 l o one. And this
NOTE Confidence: 0.887406
00:22:42.419 --> 00:22:43.640 is a histone methyltransferase
NOTE Confidence: 0.9933622
00:22:44.260 --> 00:22:45.619 that really plays a really
NOTE Confidence: 0.9933622
00:22:45.619 --> 00:22:47.000 critical role in neurogenesis
NOTE Confidence: 0.9406062
00:22:47.475 --> 00:22:48.775 and is a key maintenance
NOTE Confidence: 0.9406062
00:22:49.075 --> 00:22:50.615 of transcriptional memory.
NOTE Confidence: 0.99076426
00:22:51.155 --> 00:22:52.115 And I don't know if
NOTE Confidence: 0.99076426
00:22:52.115 --> 00:22:52.855 you remember,
NOTE Confidence: 0.99813867
00:22:53.475 --> 00:22:54.674 h three k four was
NOTE Confidence: 0.99813867
00:22:54.674 --> 00:22:55.494 one of the epigenetic
NOTE Confidence: 0.9991914
00:22:55.955 --> 00:22:57.234 signatures that we saw in
NOTE Confidence: 0.9991914
00:22:57.234 --> 00:22:57.895 the placenta
NOTE Confidence: 0.9291741
00:22:58.755 --> 00:22:59.955 of those that had been
NOTE Confidence: 0.9291741
00:22:59.955 --> 00:23:00.455 exposed,
NOTE Confidence: 0.8403753

00:23:01.234 --> 00:23:01.734 to,
NOTE Confidence: 0.9936101

00:23:02.115 --> 00:23:02.615 to
NOTE Confidence: 0.83964014

00:23:03.380 --> 00:23:04.440 THC candidates.
NOTE Confidence: 0.9943044

00:23:04.740 --> 00:23:05.700 And we can see this
NOTE Confidence: 0.9943044

00:23:05.700 --> 00:23:06.840 not only prenatally
NOTE Confidence: 0.9674624

00:23:07.220 --> 00:23:08.420 or right at at birth.
NOTE Confidence: 0.9674624

00:23:08.420 --> 00:23:09.540 We can see this throughout
NOTE Confidence: 0.9674624

00:23:09.540 --> 00:23:10.740 their lives, not only in
NOTE Confidence: 0.9674624

00:23:10.740 --> 00:23:12.260 the gene expression, but also
NOTE Confidence: 0.9674624

00:23:12.260 --> 00:23:13.380 in the protein level as
NOTE Confidence: 0.9674624

00:23:13.380 --> 00:23:14.820 well. The one thing with
NOTE Confidence: 0.9674624

00:23:14.820 --> 00:23:16.340 animal models, we can at
NOTE Confidence: 0.9674624

00:23:16.340 --> 00:23:17.640 least go in and mechanistically
NOTE Confidence: 0.99922687

00:23:18.020 --> 00:23:20.225 see is this epigenetic
NOTE Confidence: 0.96619385

00:23:23.325 --> 00:23:25.085 modification critical for the behaviors
NOTE Confidence: 0.96619385

00:23:25.085 --> 00:23:26.305 that we see in adulthood?

NOTE Confidence: 0.96619385
00:23:26.525 --> 00:23:27.725 So we can go in
NOTE Confidence: 0.96619385
00:23:27.725 --> 00:23:29.505 and virally, for example,
NOTE Confidence: 0.9769273
00:23:30.365 --> 00:23:31.345 change the
NOTE Confidence: 0.7210792
00:23:32.350 --> 00:23:33.409 increase the expression,
NOTE Confidence: 0.951637
00:23:33.710 --> 00:23:34.510 or I should say, knock
NOTE Confidence: 0.951637
00:23:34.510 --> 00:23:35.710 down the expression of this
NOTE Confidence: 0.951637
00:23:35.710 --> 00:23:37.630 particular gene, and we could
NOTE Confidence: 0.951637
00:23:37.630 --> 00:23:39.549 actually then change their behavior.
NOTE Confidence: 0.951637
00:23:39.549 --> 00:23:40.450 So for example,
NOTE Confidence: 0.93447435
00:23:41.549 --> 00:23:42.669 animals, as I showed you
NOTE Confidence: 0.93447435
00:23:42.669 --> 00:23:44.510 before, that, they've showed changes
NOTE Confidence: 0.93447435
00:23:44.510 --> 00:23:46.634 in motivated behavior with prenatal
NOTE Confidence: 0.93447435
00:23:46.634 --> 00:23:48.715 THC exposure and knocking down
NOTE Confidence: 0.93447435
00:23:48.715 --> 00:23:50.654 the KMT two a epigenetic
NOTE Confidence: 0.9741503
00:23:51.034 --> 00:23:53.054 gene, it normalized their behavior.
NOTE Confidence: 0.9732413

00:23:53.835 --> 00:23:54.894 We can also,
NOTE Confidence: 0.9132012

00:23:55.674 --> 00:23:56.575 see that,
NOTE Confidence: 0.99861145

00:23:57.780 --> 00:24:00.020 this particular epigenetic tag is
NOTE Confidence: 0.99861145

00:24:00.020 --> 00:24:01.400 a really strong
NOTE Confidence: 0.9999007

00:24:01.700 --> 00:24:02.200 driver
NOTE Confidence: 0.95370656

00:24:02.580 --> 00:24:03.700 of the genes that are
NOTE Confidence: 0.95370656

00:24:03.700 --> 00:24:04.200 downregulated.
NOTE Confidence: 0.9852082

00:24:04.820 --> 00:24:05.940 For example, here in the
NOTE Confidence: 0.9852082

00:24:05.940 --> 00:24:06.920 nucleus accumbens,
NOTE Confidence: 0.98066634

00:24:07.220 --> 00:24:08.119 this is already,
NOTE Confidence: 0.99609375

00:24:09.060 --> 00:24:10.040 during infancy.
NOTE Confidence: 0.9855919

00:24:10.555 --> 00:24:11.835 Early infancy, we can see
NOTE Confidence: 0.9855919

00:24:11.835 --> 00:24:13.115 that this plays a really
NOTE Confidence: 0.9855919

00:24:13.115 --> 00:24:13.855 key role,
NOTE Confidence: 0.9985705

00:24:14.234 --> 00:24:16.255 and it's related to
NOTE Confidence: 0.9692353

00:24:18.555 --> 00:24:19.135 the postsynaptic

NOTE Confidence: 0.94719744
00:24:19.435 --> 00:24:21.695 density, the synaptic organization,
NOTE Confidence: 0.99870646
00:24:22.795 --> 00:24:24.255 in these in these animals.
NOTE Confidence: 0.96986884
00:24:25.210 --> 00:24:26.730 In adulthood, we we could
NOTE Confidence: 0.96986884
00:24:26.970 --> 00:24:28.570 we also looked at where
NOTE Confidence: 0.96986884
00:24:28.570 --> 00:24:30.030 is this particular epigenetic
NOTE Confidence: 0.8619095
00:24:30.330 --> 00:24:30.830 tag,
NOTE Confidence: 0.9630088
00:24:32.810 --> 00:24:34.430 localized to all these genes.
NOTE Confidence: 0.9630088
00:24:34.650 --> 00:24:35.950 And we could see that
NOTE Confidence: 0.9630088
00:24:36.170 --> 00:24:36.670 in
NOTE Confidence: 0.97380304
00:24:37.505 --> 00:24:39.605 in normal animals, the relationship
NOTE Confidence: 0.97380304
00:24:39.665 --> 00:24:41.125 of where these tags are
NOTE Confidence: 0.97380304
00:24:41.185 --> 00:24:43.125 completely changed in those,
NOTE Confidence: 0.95834017
00:24:43.825 --> 00:24:44.645 that had,
NOTE Confidence: 0.9933053
00:24:45.185 --> 00:24:47.205 been exposed prenatally to THC.
NOTE Confidence: 0.9566745
00:24:47.744 --> 00:24:49.285 It completely reorganized,
NOTE Confidence: 0.9996948

00:24:49.905 --> 00:24:51.605 and it was very strongly
NOTE Confidence: 0.99682915

00:24:52.450 --> 00:24:54.869 enriched in immune related genes.
NOTE Confidence: 0.9858108

00:24:55.570 --> 00:24:57.170 And this is the, the
NOTE Confidence: 0.9858108

00:24:57.170 --> 00:24:59.170 nucleus accumbens of of adult
NOTE Confidence: 0.9858108

00:24:59.170 --> 00:25:01.110 rats with prenatal THC exposure.
NOTE Confidence: 0.9235035

00:25:02.050 --> 00:25:03.510 We could also see that
NOTE Confidence: 0.98155093

00:25:04.304 --> 00:25:05.664 consistent with what we saw
NOTE Confidence: 0.98155093

00:25:05.664 --> 00:25:06.945 even early in life that
NOTE Confidence: 0.98155093

00:25:06.945 --> 00:25:08.945 this particular tag is really
NOTE Confidence: 0.98155093

00:25:08.945 --> 00:25:10.164 strongly linked to,
NOTE Confidence: 0.9996277

00:25:10.945 --> 00:25:11.445 regulating
NOTE Confidence: 0.9261476

00:25:12.225 --> 00:25:14.004 aspects of synaptic plasticity.
NOTE Confidence: 0.9822307

00:25:15.825 --> 00:25:16.325 So,
NOTE Confidence: 0.9737241

00:25:17.980 --> 00:25:18.480 yes,
NOTE Confidence: 0.86380833

00:25:19.179 --> 00:25:21.100 the fetal or exposure to
NOTE Confidence: 0.86380833

00:25:21.100 --> 00:25:22.960 cannabis and and to THC,

NOTE Confidence: 0.98593515
00:25:23.500 --> 00:25:24.619 we can see long term
NOTE Confidence: 0.98593515
00:25:24.619 --> 00:25:26.460 effects. We can see specific
NOTE Confidence: 0.98593515
00:25:26.460 --> 00:25:26.960 changes,
NOTE Confidence: 0.9557882
00:25:28.380 --> 00:25:29.920 in not only in placenta
NOTE Confidence: 0.9557882
00:25:29.980 --> 00:25:31.040 that predicts later
NOTE Confidence: 0.94326925
00:25:31.615 --> 00:25:32.815 behavior both in a human
NOTE Confidence: 0.94326925
00:25:32.815 --> 00:25:34.195 and in our animal models,
NOTE Confidence: 0.94326925
00:25:34.255 --> 00:25:35.455 but we can also see
NOTE Confidence: 0.94326925
00:25:35.455 --> 00:25:36.734 this long term effects into
NOTE Confidence: 0.94326925
00:25:36.734 --> 00:25:37.234 adulthood.
NOTE Confidence: 0.9995983
00:25:38.335 --> 00:25:39.315 The other developmental
NOTE Confidence: 0.99989057
00:25:39.615 --> 00:25:40.115 window
NOTE Confidence: 0.7768501
00:25:40.815 --> 00:25:42.335 that we studied and actually
NOTE Confidence: 0.7768501
00:25:42.335 --> 00:25:44.195 perhaps we started with adolescents,
NOTE Confidence: 0.9435372
00:25:44.600 --> 00:25:45.640 And in in part of
NOTE Confidence: 0.9435372

00:25:45.640 --> 00:25:46.760 that time, as I mentioned
NOTE Confidence: 0.9435372

00:25:46.760 --> 00:25:47.260 earlier,
NOTE Confidence: 0.93016714

00:25:47.640 --> 00:25:49.080 you know, these questions about,
NOTE Confidence: 0.93016714

00:25:49.080 --> 00:25:50.780 quote, unquote, the gateway hypothesis
NOTE Confidence: 0.93016714

00:25:50.840 --> 00:25:51.960 of cannabis, as there was
NOTE Confidence: 0.93016714

00:25:51.960 --> 00:25:53.240 a gateway with nicotine and
NOTE Confidence: 0.93016714

00:25:53.240 --> 00:25:55.100 alcohol, does it lead to
NOTE Confidence: 0.7571587

00:25:55.400 --> 00:25:55.900 greater,
NOTE Confidence: 0.92473245

00:25:56.815 --> 00:25:58.575 intake of of, like, heavy
NOTE Confidence: 0.92473245

00:25:58.575 --> 00:26:00.255 drugs such as heroin or
NOTE Confidence: 0.92473245

00:26:00.255 --> 00:26:00.755 so?
NOTE Confidence: 0.999146

00:26:01.055 --> 00:26:01.555 And
NOTE Confidence: 0.89035475

00:26:02.494 --> 00:26:04.175 the question again, you know,
NOTE Confidence: 0.89035475

00:26:04.175 --> 00:26:06.195 this has been a huge,
NOTE Confidence: 0.93637335

00:26:07.135 --> 00:26:08.355 debate in our society.
NOTE Confidence: 0.9965565

00:26:08.734 --> 00:26:09.475 And so

NOTE Confidence: 0.9776726
00:26:10.440 --> 00:26:11.320 we now have a lot
NOTE Confidence: 0.9776726
00:26:11.320 --> 00:26:13.020 of studies looking into this.
NOTE Confidence: 0.9776726
00:26:13.080 --> 00:26:13.960 And one of the things
NOTE Confidence: 0.9776726
00:26:13.960 --> 00:26:15.240 about the adolescent brain that,
NOTE Confidence: 0.9776726
00:26:15.240 --> 00:26:16.840 as I mentioned earlier, you
NOTE Confidence: 0.9776726
00:26:16.840 --> 00:26:19.000 know, this is the last
NOTE Confidence: 0.9776726
00:26:19.000 --> 00:26:20.200 window and into the young
NOTE Confidence: 0.9776726
00:26:20.200 --> 00:26:21.799 adulthood of the fine tuning
NOTE Confidence: 0.9776726
00:26:21.799 --> 00:26:23.419 and maturation of the prefrontal
NOTE Confidence: 0.9776726
00:26:23.559 --> 00:26:24.059 cortex.
NOTE Confidence: 0.95654523
00:26:24.544 --> 00:26:25.744 And we know now that,
NOTE Confidence: 0.95654523
00:26:25.744 --> 00:26:27.184 you know, more teens are
NOTE Confidence: 0.95654523
00:26:27.184 --> 00:26:28.945 using cannabis in terms of
NOTE Confidence: 0.95654523
00:26:28.945 --> 00:26:29.684 more frequently
NOTE Confidence: 0.94668
00:26:30.304 --> 00:26:32.145 and more near daily use
NOTE Confidence: 0.94668

00:26:32.145 --> 00:26:32.965 of cannabis.
NOTE Confidence: 0.99672973

00:26:33.585 --> 00:26:34.085 And
NOTE Confidence: 0.97211915

00:26:35.345 --> 00:26:36.145 at the end of the
NOTE Confidence: 0.97211915

00:26:36.145 --> 00:26:37.890 day, we also know that
NOTE Confidence: 0.97211915

00:26:38.130 --> 00:26:39.570 adolescence is a really important
NOTE Confidence: 0.97211915

00:26:39.570 --> 00:26:40.770 window if we wanna talk
NOTE Confidence: 0.97211915

00:26:40.770 --> 00:26:43.410 about or intervene and reduce
NOTE Confidence: 0.97211915

00:26:43.490 --> 00:26:44.869 and mitigate some of the
NOTE Confidence: 0.97211915

00:26:45.090 --> 00:26:46.850 adult substance use disorders that
NOTE Confidence: 0.97211915

00:26:46.850 --> 00:26:48.609 we see. And sadly, a
NOTE Confidence: 0.97211915

00:26:48.609 --> 00:26:50.210 large percentage of teens already
NOTE Confidence: 0.97211915

00:26:50.210 --> 00:26:51.750 meet a cannabis use disorder.
NOTE Confidence: 0.99191535

00:26:52.165 --> 00:26:53.785 So it's really an important,
NOTE Confidence: 0.99191535

00:26:53.925 --> 00:26:55.445 I think, developmental window for
NOTE Confidence: 0.99191535

00:26:55.445 --> 00:26:56.425 us to look at.
NOTE Confidence: 0.97813255

00:26:57.125 --> 00:26:59.285 So the question, you know,

NOTE Confidence: 0.97813255
00:26:59.285 --> 00:27:00.565 as we see it is
NOTE Confidence: 0.97813255
00:27:00.565 --> 00:27:02.585 that the you know, we
NOTE Confidence: 0.97813255
00:27:02.645 --> 00:27:03.605 know that a number of
NOTE Confidence: 0.97813255
00:27:03.605 --> 00:27:03.845 studies
NOTE Confidence: 0.866818
00:27:04.500 --> 00:27:05.380 this is where I thought
NOTE Confidence: 0.866818
00:27:05.380 --> 00:27:05.960 I had
NOTE Confidence: 0.9617748
00:27:06.420 --> 00:27:07.540 a number of studies have
NOTE Confidence: 0.9617748
00:27:07.540 --> 00:27:08.359 shown that,
NOTE Confidence: 0.79472256
00:27:09.140 --> 00:27:09.960 in humans,
NOTE Confidence: 0.9555738
00:27:10.580 --> 00:27:12.740 population, longitudinal studies, that there
NOTE Confidence: 0.9555738
00:27:12.740 --> 00:27:13.940 are changes in the prefrontal
NOTE Confidence: 0.9555738
00:27:13.940 --> 00:27:15.160 cortex with cannabis,
NOTE Confidence: 0.9501543
00:27:15.859 --> 00:27:17.800 exposure during use during adolescence.
NOTE Confidence: 0.9604812
00:27:18.180 --> 00:27:19.540 And there there are studies
NOTE Confidence: 0.9604812
00:27:19.540 --> 00:27:19.965 that
NOTE Confidence: 0.9029459

00:27:20.924 --> 00:27:23.424 will contradict those results and
NOTE Confidence: 0.9029459

00:27:23.484 --> 00:27:24.845 more of the studies being
NOTE Confidence: 0.9029459

00:27:24.845 --> 00:27:25.804 done like the a, b,
NOTE Confidence: 0.9029459

00:27:25.804 --> 00:27:27.645 c, d and imaging from
NOTE Confidence: 0.9029459

00:27:27.645 --> 00:27:28.225 the Europe,
NOTE Confidence: 0.96068794

00:27:29.005 --> 00:27:31.005 neuroimaging studies are really helping
NOTE Confidence: 0.96068794

00:27:31.005 --> 00:27:32.225 to give us some insights.
NOTE Confidence: 0.96068794

00:27:32.450 --> 00:27:33.490 But what we wanted to
NOTE Confidence: 0.96068794

00:27:33.490 --> 00:27:34.530 look at is, like, using
NOTE Confidence: 0.96068794

00:27:34.530 --> 00:27:35.809 an animal model, not to
NOTE Confidence: 0.96068794

00:27:35.809 --> 00:27:37.010 worry about their friends or
NOTE Confidence: 0.96068794

00:27:37.010 --> 00:27:37.750 their mothers,
NOTE Confidence: 0.95098597

00:27:38.210 --> 00:27:40.609 does adolescent TFT exposure impact
NOTE Confidence: 0.95098597

00:27:40.609 --> 00:27:42.690 prefrontal cortical development? And so
NOTE Confidence: 0.95098597

00:27:42.690 --> 00:27:44.290 we can actually look at
NOTE Confidence: 0.95098597

00:27:44.290 --> 00:27:45.350 cortical cells,

NOTE Confidence: 0.9971631
00:27:45.875 --> 00:27:47.255 and we could see that
NOTE Confidence: 0.9971631
00:27:47.315 --> 00:27:49.415 in, young adults that had,
NOTE Confidence: 0.9278531
00:27:50.275 --> 00:27:51.975 adolescent exposure to THC
NOTE Confidence: 0.9008973
00:27:52.595 --> 00:27:54.435 that their the cortical their
NOTE Confidence: 0.9008973
00:27:54.435 --> 00:27:54.935 prefrontal
NOTE Confidence: 0.99957013
00:27:55.475 --> 00:27:56.535 pyramidal cells
NOTE Confidence: 0.92974234
00:27:57.075 --> 00:27:58.835 look very different compared to
NOTE Confidence: 0.92974234
00:27:58.835 --> 00:27:59.335 normal,
NOTE Confidence: 0.9889685
00:27:59.670 --> 00:28:01.270 That there was a difference
NOTE Confidence: 0.9889685
00:28:01.270 --> 00:28:02.250 in the complexity
NOTE Confidence: 0.95312005
00:28:02.790 --> 00:28:03.770 of the neurons,
NOTE Confidence: 0.99281126
00:28:04.070 --> 00:28:05.430 both in the apical branching
NOTE Confidence: 0.99281126
00:28:05.430 --> 00:28:06.490 and basal branching.
NOTE Confidence: 0.99966633
00:28:07.110 --> 00:28:08.150 And the thing that was
NOTE Confidence: 0.99966633
00:28:08.150 --> 00:28:09.290 interesting is that
NOTE Confidence: 0.9326747

00:28:09.590 --> 00:28:11.290 where these changes were occurring

NOTE Confidence: 0.99742186

00:28:12.045 --> 00:28:12.865 really resembled

NOTE Confidence: 0.9390183

00:28:13.485 --> 00:28:15.085 what morphological change that had

NOTE Confidence: 0.9390183

00:28:15.085 --> 00:28:16.925 been documented in the prefrontal

NOTE Confidence: 0.9390183

00:28:16.925 --> 00:28:17.425 cortex

NOTE Confidence: 0.99169165

00:28:17.725 --> 00:28:19.405 with stress. So that was

NOTE Confidence: 0.99169165

00:28:19.405 --> 00:28:21.244 very interesting to us. And

NOTE Confidence: 0.99169165

00:28:21.244 --> 00:28:22.145 one of the things

NOTE Confidence: 0.9583035

00:28:23.165 --> 00:28:24.430 oh, this is strange. One

NOTE Confidence: 0.9583035

00:28:24.430 --> 00:28:25.470 of the things that we

NOTE Confidence: 0.9583035

00:28:25.470 --> 00:28:26.670 could also see is that

NOTE Confidence: 0.9583035

00:28:26.670 --> 00:28:27.470 we could pick up these

NOTE Confidence: 0.9583035

00:28:27.470 --> 00:28:28.350 cells and let the in

NOTE Confidence: 0.9583035

00:28:28.510 --> 00:28:29.630 the video is not going.

NOTE Confidence: 0.9583035

00:28:29.630 --> 00:28:30.590 Don't know why. And we

NOTE Confidence: 0.9583035

00:28:30.590 --> 00:28:31.790 could pick up with lasers

NOTE Confidence: 0.9583035
00:28:31.790 --> 00:28:33.330 and then sequence these cells.
NOTE Confidence: 0.9583035
00:28:33.630 --> 00:28:35.010 And we could see that
NOTE Confidence: 0.9474964
00:28:35.790 --> 00:28:37.170 in adults with,
NOTE Confidence: 0.89518195
00:28:38.205 --> 00:28:40.225 normal development of vehicle animals,
NOTE Confidence: 0.89518195
00:28:40.445 --> 00:28:42.465 that what what were gene,
NOTE Confidence: 0.99271905
00:28:43.005 --> 00:28:44.445 expression patterns that were changed
NOTE Confidence: 0.99271905
00:28:44.445 --> 00:28:45.804 were consistent with what we
NOTE Confidence: 0.99271905
00:28:45.804 --> 00:28:46.304 know
NOTE Confidence: 0.97847533
00:28:46.924 --> 00:28:48.784 happens during the normal developmental
NOTE Confidence: 0.97847533
00:28:48.845 --> 00:28:50.705 process into into adulthood.
NOTE Confidence: 0.9990017
00:28:51.085 --> 00:28:52.385 But there was a complete
NOTE Confidence: 0.9568564
00:28:53.330 --> 00:28:53.830 reorganization,
NOTE Confidence: 0.7959861
00:28:54.370 --> 00:28:54.870 complete
NOTE Confidence: 0.9680571
00:28:55.330 --> 00:28:55.830 reprogramming
NOTE Confidence: 0.97835684
00:28:56.450 --> 00:28:58.310 of the prefrontal cortical transcriptome
NOTE Confidence: 0.9484422

00:28:58.850 --> 00:29:00.050 in those adults that have
NOTE Confidence: 0.9484422

00:29:00.050 --> 00:29:01.910 had adolescent THC exposure.
NOTE Confidence: 0.97375077

00:29:02.450 --> 00:29:04.050 And where the changes were
NOTE Confidence: 0.97375077

00:29:04.050 --> 00:29:04.550 located,
NOTE Confidence: 0.93928224

00:29:05.815 --> 00:29:07.355 reflecting what we saw morphologically,
NOTE Confidence: 0.98820394

00:29:08.055 --> 00:29:09.735 meaning that the gene networks
NOTE Confidence: 0.98820394

00:29:09.735 --> 00:29:11.435 related to, you know, dendritic
NOTE Confidence: 0.98820394

00:29:11.495 --> 00:29:13.515 development and the the cell,
NOTE Confidence: 0.98521084

00:29:14.055 --> 00:29:15.975 projections and so on. But
NOTE Confidence: 0.98521084

00:29:15.975 --> 00:29:17.575 there was also this huge
NOTE Confidence: 0.98521084

00:29:17.575 --> 00:29:18.795 change in these epigenetic
NOTE Confidence: 0.9535517

00:29:19.095 --> 00:29:19.595 signatures.
NOTE Confidence: 0.9391878

00:29:20.210 --> 00:29:21.030 And interestingly,
NOTE Confidence: 0.9431693

00:29:21.570 --> 00:29:22.850 similar to what we saw
NOTE Confidence: 0.9431693

00:29:22.850 --> 00:29:24.210 in the placenta to what
NOTE Confidence: 0.9431693

00:29:24.210 --> 00:29:25.910 we saw in prenatal

NOTE Confidence: 0.9441981
00:29:26.450 --> 00:29:28.150 prenatally exposed adults,
NOTE Confidence: 0.9380212
00:29:28.610 --> 00:29:30.550 this particular epigenetic mark,
NOTE Confidence: 0.857592
00:29:31.170 --> 00:29:33.350 trimethylation of of of lysine
NOTE Confidence: 0.857592
00:29:33.410 --> 00:29:34.210 four with the k m
NOTE Confidence: 0.857592
00:29:34.210 --> 00:29:35.775 t two a gene were
NOTE Confidence: 0.857592
00:29:35.775 --> 00:29:36.515 the strongest,
NOTE Confidence: 0.9972847
00:29:37.455 --> 00:29:39.315 functional networks that were changed.
NOTE Confidence: 0.9748039
00:29:39.935 --> 00:29:41.055 They were changed in such
NOTE Confidence: 0.9748039
00:29:41.055 --> 00:29:42.115 a way that,
NOTE Confidence: 0.9202643
00:29:43.295 --> 00:29:45.795 that these epigenetic related genes
NOTE Confidence: 0.9202643
00:29:46.015 --> 00:29:48.275 and these dendritic or synaptic
NOTE Confidence: 0.9202643
00:29:48.415 --> 00:29:49.875 blastocystis related genes
NOTE Confidence: 0.98206407
00:29:50.870 --> 00:29:52.470 are you know, they're not
NOTE Confidence: 0.98206407
00:29:52.470 --> 00:29:52.970 really
NOTE Confidence: 0.6622441
00:29:53.350 --> 00:29:54.010 a strong,
NOTE Confidence: 0.9498971

00:29:54.630 --> 00:29:57.190 correlation in normal animals. But
NOTE Confidence: 0.9498971

00:29:57.190 --> 00:29:58.790 in those adults with the,
NOTE Confidence: 0.9498971

00:29:59.030 --> 00:30:00.950 adolescent THC exposure, there was
NOTE Confidence: 0.9498971

00:30:00.950 --> 00:30:01.610 a complete,
NOTE Confidence: 0.9712455

00:30:01.990 --> 00:30:03.050 again, reorganization.
NOTE Confidence: 0.9921863

00:30:03.975 --> 00:30:05.815 And there was an overlap
NOTE Confidence: 0.9921863

00:30:05.815 --> 00:30:08.475 between these differentially expressed genes
NOTE Confidence: 0.9921863

00:30:08.535 --> 00:30:10.054 in our animal models and
NOTE Confidence: 0.9921863

00:30:10.054 --> 00:30:11.835 when we studied the prefrontal
NOTE Confidence: 0.9921863

00:30:11.975 --> 00:30:12.475 cortex
NOTE Confidence: 0.96993434

00:30:12.775 --> 00:30:14.215 of individuals who had been
NOTE Confidence: 0.96993434

00:30:14.215 --> 00:30:15.355 diagnosed with schizophrenia.
NOTE Confidence: 0.97722447

00:30:16.100 --> 00:30:17.480 So it's interesting that
NOTE Confidence: 0.99786925

00:30:17.780 --> 00:30:18.520 the THC
NOTE Confidence: 0.9359793

00:30:19.220 --> 00:30:21.140 is, is impacting on some
NOTE Confidence: 0.9359793

00:30:21.140 --> 00:30:22.200 similar networks

NOTE Confidence: 0.99934304
00:30:22.820 --> 00:30:24.680 that you see with schizophrenia.
NOTE Confidence: 0.9914812
00:30:26.180 --> 00:30:26.980 One of the things that
NOTE Confidence: 0.9914812
00:30:26.980 --> 00:30:28.340 we had seen from very
NOTE Confidence: 0.9914812
00:30:28.340 --> 00:30:30.260 early was that adolescent THC
NOTE Confidence: 0.9914812
00:30:30.260 --> 00:30:32.554 exposure increases heroin self administration.
NOTE Confidence: 0.95414066
00:30:33.015 --> 00:30:34.054 So it's not about the
NOTE Confidence: 0.95414066
00:30:34.054 --> 00:30:35.095 friends. It's not about, you
NOTE Confidence: 0.95414066
00:30:35.095 --> 00:30:36.135 know, their parents and their
NOTE Confidence: 0.95414066
00:30:36.135 --> 00:30:37.895 neighborhoods, just in terms of
NOTE Confidence: 0.95414066
00:30:37.895 --> 00:30:39.835 changing the biological signatures
NOTE Confidence: 0.99866366
00:30:40.215 --> 00:30:41.914 and sensitivity to opioids.
NOTE Confidence: 0.936892
00:30:44.710 --> 00:30:45.669 But one of the things
NOTE Confidence: 0.936892
00:30:45.669 --> 00:30:46.789 that we also wanted to
NOTE Confidence: 0.936892
00:30:46.789 --> 00:30:47.990 look at was this aspect
NOTE Confidence: 0.936892
00:30:47.990 --> 00:30:49.750 that we saw repeatedly coming
NOTE Confidence: 0.936892

00:30:49.750 --> 00:30:50.870 up is this aspect of
NOTE Confidence: 0.936892

00:30:50.870 --> 00:30:52.230 stress. And at that time,
NOTE Confidence: 0.936892

00:30:52.230 --> 00:30:53.110 a new post doc of
NOTE Confidence: 0.936892

00:30:53.110 --> 00:30:53.990 the team at that time,
NOTE Confidence: 0.936892

00:30:53.990 --> 00:30:55.270 Jackie Furlan, who now runs
NOTE Confidence: 0.936892

00:30:55.270 --> 00:30:57.130 her own show, was interested
NOTE Confidence: 0.936892

00:30:57.190 --> 00:30:58.975 also in understanding this aspect
NOTE Confidence: 0.936892

00:30:58.975 --> 00:30:59.635 of stress.
NOTE Confidence: 0.9586682

00:31:00.015 --> 00:31:00.895 And the reason is when
NOTE Confidence: 0.9586682

00:31:00.895 --> 00:31:02.915 we gave THC to adolescent
NOTE Confidence: 0.9586682

00:31:03.215 --> 00:31:03.715 animals,
NOTE Confidence: 0.933869

00:31:04.015 --> 00:31:05.855 we see this huge increase
NOTE Confidence: 0.933869

00:31:05.855 --> 00:31:07.635 in their stress hormone, corticosterone.
NOTE Confidence: 0.9742704

00:31:08.335 --> 00:31:09.855 We, we had also seen
NOTE Confidence: 0.9742704

00:31:09.855 --> 00:31:11.535 increased cortisol levels in our
NOTE Confidence: 0.9742704

00:31:11.535 --> 00:31:13.360 human subjects, but this lasted

NOTE Confidence: 0.9742704
00:31:13.360 --> 00:31:14.480 for a very long time
NOTE Confidence: 0.9742704
00:31:14.480 --> 00:31:15.940 after their last injection
NOTE Confidence: 0.94321764
00:31:16.240 --> 00:31:18.000 in these animal models. And
NOTE Confidence: 0.94321764
00:31:18.000 --> 00:31:19.040 if we had,
NOTE Confidence: 0.97534084
00:31:19.679 --> 00:31:21.299 exposed them to an acute
NOTE Confidence: 0.97534084
00:31:21.360 --> 00:31:21.860 isolation
NOTE Confidence: 0.9962926
00:31:22.160 --> 00:31:22.660 stress,
NOTE Confidence: 0.9307711
00:31:23.280 --> 00:31:25.200 those animals that had and
NOTE Confidence: 0.9307711
00:31:25.200 --> 00:31:26.080 I should have said sorry,
NOTE Confidence: 0.9307711
00:31:26.080 --> 00:31:26.960 that we looked at two
NOTE Confidence: 0.9307711
00:31:26.960 --> 00:31:28.100 doses. And because
NOTE Confidence: 0.99494094
00:31:28.615 --> 00:31:30.075 the dose of THC,
NOTE Confidence: 0.98932683
00:31:31.015 --> 00:31:33.015 in cannabis has has increased
NOTE Confidence: 0.98932683
00:31:33.015 --> 00:31:34.475 so much over the years,
NOTE Confidence: 0.98932683
00:31:34.534 --> 00:31:35.495 we decided to look at
NOTE Confidence: 0.98932683

00:31:35.495 --> 00:31:36.695 what does a low dose,
NOTE Confidence: 0.98932683

00:31:36.695 --> 00:31:37.735 which was, you know, what
NOTE Confidence: 0.98932683

00:31:37.735 --> 00:31:39.575 the cannabis THC doses were
NOTE Confidence: 0.98932683

00:31:39.575 --> 00:31:40.235 back then
NOTE Confidence: 0.95262766

00:31:40.580 --> 00:31:41.320 to today,
NOTE Confidence: 0.90459394

00:31:41.860 --> 00:31:43.380 THC doses. And we can
NOTE Confidence: 0.90459394

00:31:43.380 --> 00:31:44.760 see that the dose matter
NOTE Confidence: 0.969773

00:31:45.060 --> 00:31:46.840 so that the stress levels
NOTE Confidence: 0.9858721

00:31:47.140 --> 00:31:49.060 were or hormone levels were
NOTE Confidence: 0.9858721

00:31:49.060 --> 00:31:50.280 maintained mainly
NOTE Confidence: 0.9442843

00:31:50.660 --> 00:31:51.960 in the high dose animals,
NOTE Confidence: 0.97807515

00:31:52.500 --> 00:31:54.500 and their response to,
NOTE Confidence: 0.9911711

00:31:55.060 --> 00:31:55.720 a reward
NOTE Confidence: 0.54435426

00:31:56.475 --> 00:31:56.975 reward
NOTE Confidence: 0.9318989

00:31:58.475 --> 00:31:59.695 after being isolated,
NOTE Confidence: 0.94048965

00:32:00.075 --> 00:32:00.975 social isolation,

NOTE Confidence: 0.9656414

00:32:01.275 --> 00:32:02.395 was again in the high

NOTE Confidence: 0.9656414

00:32:02.395 --> 00:32:03.835 dose animals, not the low

NOTE Confidence: 0.9656414

00:32:03.835 --> 00:32:04.335 dose.

NOTE Confidence: 0.9687725

00:32:05.674 --> 00:32:07.595 Now decision making, again, we

NOTE Confidence: 0.9687725

00:32:07.595 --> 00:32:08.554 see these changes in the

NOTE Confidence: 0.9687725

00:32:08.554 --> 00:32:10.715 prefrontal cortex, and decision making

NOTE Confidence: 0.9687725

00:32:10.715 --> 00:32:12.100 is really a critical feature

NOTE Confidence: 0.9687725

00:32:12.100 --> 00:32:13.799 of of a lot of

NOTE Confidence: 0.9687725

00:32:13.860 --> 00:32:15.080 substance use disorder,

NOTE Confidence: 0.8489313

00:32:16.740 --> 00:32:17.240 phenotypes.

NOTE Confidence: 0.93958414

00:32:17.860 --> 00:32:19.220 And we know that decision

NOTE Confidence: 0.93958414

00:32:19.220 --> 00:32:21.080 making in human cannabis users,

NOTE Confidence: 0.90202075

00:32:21.860 --> 00:32:23.299 we this they were studied

NOTE Confidence: 0.90202075

00:32:23.299 --> 00:32:25.365 with the Iowa gambling task.

NOTE Confidence: 0.90202075

00:32:25.605 --> 00:32:27.705 So they're this task basically

NOTE Confidence: 0.90202075

00:32:27.845 --> 00:32:28.345 measures,
NOTE Confidence: 0.85702956
00:32:28.645 --> 00:32:30.005 you know, as as a
NOTE Confidence: 0.85702956
00:32:30.005 --> 00:32:31.385 decision making for,
NOTE Confidence: 0.8542815
00:32:31.925 --> 00:32:33.605 understanding that the the decks
NOTE Confidence: 0.8542815
00:32:33.605 --> 00:32:34.345 of cards
NOTE Confidence: 0.8886527
00:32:34.725 --> 00:32:35.465 may give,
NOTE Confidence: 0.99108386
00:32:36.085 --> 00:32:36.585 advantageous
NOTE Confidence: 0.90553576
00:32:37.810 --> 00:32:38.630 money reward,
NOTE Confidence: 0.99633324
00:32:39.250 --> 00:32:41.410 but those are over time,
NOTE Confidence: 0.99633324
00:32:41.410 --> 00:32:42.930 you will actually lose if
NOTE Confidence: 0.99633324
00:32:42.930 --> 00:32:44.690 you choose continue to choose
NOTE Confidence: 0.99633324
00:32:44.690 --> 00:32:45.190 those.
NOTE Confidence: 0.99860686
00:32:45.570 --> 00:32:46.070 And
NOTE Confidence: 0.8409804
00:32:46.530 --> 00:32:47.030 most,
NOTE Confidence: 0.9964453
00:32:47.730 --> 00:32:48.790 healthy individuals
NOTE Confidence: 0.9813533
00:32:49.570 --> 00:32:51.090 learn very quickly to make

NOTE Confidence: 0.9813533
00:32:51.090 --> 00:32:52.070 optimal choices.
NOTE Confidence: 0.96360207
00:32:52.695 --> 00:32:54.934 But individual adults with cannabis
NOTE Confidence: 0.96360207
00:32:54.934 --> 00:32:55.674 use disorder,
NOTE Confidence: 0.9982721
00:32:55.975 --> 00:32:57.595 they make the riskier choices
NOTE Confidence: 0.98227435
00:32:58.135 --> 00:32:59.975 in this Iowa gambling task.
NOTE Confidence: 0.98227435
00:32:59.975 --> 00:33:01.255 And this actually fits with
NOTE Confidence: 0.98227435
00:33:01.255 --> 00:33:02.294 what you see with other
NOTE Confidence: 0.98227435
00:33:02.294 --> 00:33:02.794 substance,
NOTE Confidence: 0.93697715
00:33:03.095 --> 00:33:04.294 use disorders. So it's not
NOTE Confidence: 0.93697715
00:33:04.294 --> 00:33:06.154 just only cannabis users.
NOTE Confidence: 0.9270838
00:33:06.980 --> 00:33:08.100 But we then want to
NOTE Confidence: 0.9270838
00:33:08.100 --> 00:33:08.980 see, can we look at
NOTE Confidence: 0.9270838
00:33:08.980 --> 00:33:09.780 the same thing in our
NOTE Confidence: 0.9270838
00:33:09.780 --> 00:33:11.700 animal models? And so we
NOTE Confidence: 0.9270838
00:33:11.700 --> 00:33:13.380 would use the rat gambling
NOTE Confidence: 0.9270838

00:33:13.380 --> 00:33:14.900 task, and they don't care
NOTE Confidence: 0.9270838

00:33:14.900 --> 00:33:16.260 about money, but they care
NOTE Confidence: 0.9270838

00:33:16.260 --> 00:33:18.020 about, for example, sucrose. And
NOTE Confidence: 0.9270838

00:33:18.020 --> 00:33:19.480 it's the same thing where
NOTE Confidence: 0.9270838

00:33:19.540 --> 00:33:20.600 they the pope,
NOTE Confidence: 0.29769987

00:33:21.285 --> 00:33:21.785 in
NOTE Confidence: 0.7410026

00:33:24.245 --> 00:33:25.705 nose pokes for
NOTE Confidence: 0.9240287

00:33:27.045 --> 00:33:28.725 either getting, like, one pellet
NOTE Confidence: 0.9240287

00:33:28.725 --> 00:33:30.265 or four pellets, and these
NOTE Confidence: 0.9240287

00:33:30.405 --> 00:33:31.865 the pellets that initially,
NOTE Confidence: 0.92606354

00:33:32.325 --> 00:33:33.365 look like they're gonna give
NOTE Confidence: 0.92606354

00:33:33.365 --> 00:33:34.245 you a lot turn out
NOTE Confidence: 0.92606354

00:33:34.245 --> 00:33:35.465 in the end to be,
NOTE Confidence: 0.99340445

00:33:35.809 --> 00:33:36.309 disadvantageous.
NOTE Confidence: 0.9321801

00:33:37.010 --> 00:33:37.890 And similar to what we
NOTE Confidence: 0.9321801

00:33:37.890 --> 00:33:38.950 see in our humans,

NOTE Confidence: 0.98250467
00:33:39.250 --> 00:33:40.210 at least for the high
NOTE Confidence: 0.98250467
00:33:40.210 --> 00:33:40.710 dose,
NOTE Confidence: 0.98828924
00:33:41.090 --> 00:33:42.530 the animals that had high
NOTE Confidence: 0.98828924
00:33:42.530 --> 00:33:44.530 dose THC during adolescence, they
NOTE Confidence: 0.98828924
00:33:44.530 --> 00:33:46.550 show more riskier decision making.
NOTE Confidence: 0.97406834
00:33:47.410 --> 00:33:48.950 Interesting, the low dose animals
NOTE Confidence: 0.90177697
00:33:49.570 --> 00:33:50.530 seem to stick to one
NOTE Confidence: 0.90177697
00:33:50.530 --> 00:33:52.585 and does which interesting those,
NOTE Confidence: 0.90177697
00:33:52.585 --> 00:33:53.804 quote, unquote, optimal.
NOTE Confidence: 0.99947137
00:33:54.424 --> 00:33:54.924 So
NOTE Confidence: 0.9985591
00:33:56.265 --> 00:33:58.184 decision making is impacted also
NOTE Confidence: 0.9985591
00:33:58.184 --> 00:33:58.924 by dose.
NOTE Confidence: 0.9864752
00:34:00.025 --> 00:34:00.985 Another thing that we could
NOTE Confidence: 0.9864752
00:34:00.985 --> 00:34:01.865 see is when they were
NOTE Confidence: 0.9864752
00:34:01.865 --> 00:34:03.485 exposed once again in adulthood
NOTE Confidence: 0.9864752

00:34:03.784 --> 00:34:04.525 to THC,
NOTE Confidence: 0.99403846

00:34:05.220 --> 00:34:07.320 once again, it's those animals
NOTE Confidence: 0.99403846

00:34:07.380 --> 00:34:08.200 that had
NOTE Confidence: 0.9145974

00:34:08.900 --> 00:34:09.859 oops. I don't know why
NOTE Confidence: 0.9145974

00:34:09.859 --> 00:34:10.980 I keep on pressing too
NOTE Confidence: 0.9145974

00:34:10.980 --> 00:34:12.660 quickly. Those animals that had
NOTE Confidence: 0.9145974

00:34:12.660 --> 00:34:14.260 the high dose THC exposure
NOTE Confidence: 0.9145974

00:34:14.260 --> 00:34:16.020 during adolescent that continue to
NOTE Confidence: 0.9145974

00:34:16.020 --> 00:34:16.520 show,
NOTE Confidence: 0.77175295

00:34:17.460 --> 00:34:18.840 risk and decision making,
NOTE Confidence: 0.9994582

00:34:19.685 --> 00:34:20.665 greater impulsivity
NOTE Confidence: 0.81368595

00:34:21.765 --> 00:34:23.145 when in in adulthood.
NOTE Confidence: 0.9499746

00:34:25.364 --> 00:34:26.645 So the question is, what
NOTE Confidence: 0.9499746

00:34:26.645 --> 00:34:28.485 are the neurobiological underpinnings? Because
NOTE Confidence: 0.9499746

00:34:28.485 --> 00:34:29.765 that's a key thing for
NOTE Confidence: 0.9499746

00:34:29.765 --> 00:34:31.364 us. And so for this

NOTE Confidence: 0.9499746

00:34:31.364 --> 00:34:32.635 particular study, we've looked at

NOTE Confidence: 0.9499746

00:34:32.885 --> 00:34:34.029 I know we've looked in

NOTE Confidence: 0.9499746

00:34:34.029 --> 00:34:35.309 the prefrontal cortex. We also

NOTE Confidence: 0.9499746

00:34:35.309 --> 00:34:37.069 see significant changes there, just

NOTE Confidence: 0.9499746

00:34:37.069 --> 00:34:38.589 emphasizing one aspect of the

NOTE Confidence: 0.9499746

00:34:38.589 --> 00:34:40.109 amygdala here because the amygdala

NOTE Confidence: 0.9499746

00:34:40.109 --> 00:34:41.309 people only think about, you

NOTE Confidence: 0.9499746

00:34:41.309 --> 00:34:42.510 know, in terms of emotional

NOTE Confidence: 0.9499746

00:34:42.510 --> 00:34:44.269 regulation and, yes, definitely anxiety

NOTE Confidence: 0.9499746

00:34:44.269 --> 00:34:45.549 and stress, but it's also

NOTE Confidence: 0.9499746

00:34:45.549 --> 00:34:47.765 critical for decision making. And

NOTE Confidence: 0.9499746

00:34:47.765 --> 00:34:49.125 we could see that the

NOTE Confidence: 0.9499746

00:34:49.125 --> 00:34:51.125 gene expression profile in the

NOTE Confidence: 0.9499746

00:34:51.125 --> 00:34:51.625 amygdala

NOTE Confidence: 0.95523393

00:34:52.325 --> 00:34:53.844 of these animals were really

NOTE Confidence: 0.95523393

00:34:53.844 --> 00:34:55.625 dramatically changed when they were
NOTE Confidence: 0.95523393

00:34:55.685 --> 00:34:57.864 stressed with this isolated stress.
NOTE Confidence: 0.97779274

00:34:58.405 --> 00:34:59.445 But it was the high
NOTE Confidence: 0.97779274

00:34:59.445 --> 00:35:01.125 dose in the combination with
NOTE Confidence: 0.97779274

00:35:01.125 --> 00:35:02.405 stress that showed the greatest
NOTE Confidence: 0.97779274

00:35:02.405 --> 00:35:02.905 effects.
NOTE Confidence: 0.93748564

00:35:03.460 --> 00:35:04.660 And the what we saw
NOTE Confidence: 0.93748564

00:35:04.660 --> 00:35:05.940 that was interesting was that
NOTE Confidence: 0.93748564

00:35:05.940 --> 00:35:06.760 these changes
NOTE Confidence: 0.9837048

00:35:07.140 --> 00:35:10.040 were really prominent in reducing
NOTE Confidence: 0.9837048

00:35:10.260 --> 00:35:10.760 expression
NOTE Confidence: 0.989169

00:35:11.780 --> 00:35:13.880 in astrocytes, these glial cells
NOTE Confidence: 0.989169

00:35:13.940 --> 00:35:15.239 that are really critical
NOTE Confidence: 0.9980421

00:35:15.940 --> 00:35:18.360 for regulating glutamate and GABA
NOTE Confidence: 0.90771645

00:35:20.085 --> 00:35:21.545 at the synaptic homeostasis,
NOTE Confidence: 0.98995763

00:35:22.245 --> 00:35:23.925 and they're really important for

NOTE Confidence: 0.98995763
00:35:23.925 --> 00:35:26.025 regulating oxidative stress and inflammation
NOTE Confidence: 0.8201859
00:35:26.565 --> 00:35:27.385 in the brain.
NOTE Confidence: 0.98932886
00:35:27.685 --> 00:35:28.565 And we could see it's
NOTE Confidence: 0.98932886
00:35:28.565 --> 00:35:29.605 not only on the gene
NOTE Confidence: 0.98932886
00:35:29.605 --> 00:35:31.525 expression level, but the actual
NOTE Confidence: 0.98932886
00:35:31.525 --> 00:35:33.205 structure, the morphology of these
NOTE Confidence: 0.98932886
00:35:33.205 --> 00:35:33.705 astrocytes
NOTE Confidence: 0.9808711
00:35:34.119 --> 00:35:35.400 were changed in the high
NOTE Confidence: 0.9808711
00:35:35.400 --> 00:35:36.920 dose animals, but not the
NOTE Confidence: 0.9808711
00:35:36.920 --> 00:35:37.900 low dose animals.
NOTE Confidence: 0.99868256
00:35:39.000 --> 00:35:39.500 So
NOTE Confidence: 0.92530656
00:35:40.520 --> 00:35:41.660 the stress sensitivity,
NOTE Confidence: 0.9891593
00:35:41.960 --> 00:35:43.320 we're looking into a lot
NOTE Confidence: 0.9891593
00:35:43.320 --> 00:35:44.839 of the perturbation, but the
NOTE Confidence: 0.9891593
00:35:44.839 --> 00:35:46.485 thing that's interesting is that
NOTE Confidence: 0.9891593

00:35:46.725 --> 00:35:48.885 these astrocyte related sorry. These
NOTE Confidence: 0.9891593

00:35:48.885 --> 00:35:50.265 astrocyte related changes
NOTE Confidence: 0.9948636

00:35:50.565 --> 00:35:52.485 actually correlated to their decision
NOTE Confidence: 0.9948636

00:35:52.485 --> 00:35:54.345 making and their impulsivity.
NOTE Confidence: 0.9967998

00:35:58.245 --> 00:35:58.745 So
NOTE Confidence: 0.93061423

00:36:00.599 --> 00:36:01.559 for us, what we have
NOTE Confidence: 0.93061423

00:36:01.559 --> 00:36:02.359 seen with a lot of
NOTE Confidence: 0.93061423

00:36:02.359 --> 00:36:03.640 our data and in terms
NOTE Confidence: 0.93061423

00:36:03.640 --> 00:36:03.960 of,
NOTE Confidence: 0.97115326

00:36:04.839 --> 00:36:05.980 not going into
NOTE Confidence: 0.95196575

00:36:07.319 --> 00:36:08.119 didn't show you all of
NOTE Confidence: 0.95196575

00:36:08.119 --> 00:36:09.239 this, but in terms of
NOTE Confidence: 0.95196575

00:36:09.239 --> 00:36:10.520 what also the field knows
NOTE Confidence: 0.95196575

00:36:10.520 --> 00:36:12.119 is that cannabis use disorder,
NOTE Confidence: 0.95196575

00:36:12.119 --> 00:36:13.400 the risk and outcomes are
NOTE Confidence: 0.95196575

00:36:13.400 --> 00:36:13.640 very

NOTE Confidence: 0.9914458
00:36:14.555 --> 00:36:15.695 are getting more clear.
NOTE Confidence: 0.9613479
00:36:15.995 --> 00:36:17.675 We definitely know that the
NOTE Confidence: 0.9613479
00:36:17.675 --> 00:36:19.135 male sex are more vulnerable,
NOTE Confidence: 0.9613479
00:36:19.275 --> 00:36:21.035 that frequent use before age
NOTE Confidence: 0.9613479
00:36:21.035 --> 00:36:21.535 sixteen,
NOTE Confidence: 0.9672074
00:36:21.835 --> 00:36:23.275 that there's, I didn't talk
NOTE Confidence: 0.9672074
00:36:23.275 --> 00:36:24.895 about the psychiatric vulnerability,
NOTE Confidence: 0.96302503
00:36:25.195 --> 00:36:27.275 but stress reactivity is really
NOTE Confidence: 0.96302503
00:36:27.275 --> 00:36:28.750 key. And a number of
NOTE Confidence: 0.96302503
00:36:28.750 --> 00:36:30.510 the studies showing and including
NOTE Confidence: 0.96302503
00:36:30.510 --> 00:36:31.330 ours showing,
NOTE Confidence: 0.9034055
00:36:32.110 --> 00:36:32.610 cortical,
NOTE Confidence: 0.9974331
00:36:33.070 --> 00:36:33.570 thinning.
NOTE Confidence: 0.9991032
00:36:34.110 --> 00:36:34.610 So
NOTE Confidence: 0.9889202
00:36:35.230 --> 00:36:37.150 it's really critical that we
NOTE Confidence: 0.9889202

00:36:37.150 --> 00:36:39.490 understand these early predictors because

NOTE Confidence: 0.9889202

00:36:39.710 --> 00:36:40.450 even here

NOTE Confidence: 0.99547124

00:36:40.935 --> 00:36:43.114 for cannabis use disorder, prenatal

NOTE Confidence: 0.99547124

00:36:43.175 --> 00:36:43.675 exposure

NOTE Confidence: 0.84715647

00:36:44.135 --> 00:36:45.575 I don't know what prenatal

NOTE Confidence: 0.84715647

00:36:45.575 --> 00:36:46.075 exposure,

NOTE Confidence: 0.9623204

00:36:47.335 --> 00:36:49.175 of cannabis really contributes a

NOTE Confidence: 0.9623204

00:36:49.175 --> 00:36:51.275 lot. Obviously, aces the environments

NOTE Confidence: 0.9623204

00:36:51.335 --> 00:36:52.855 that these individuals are in

NOTE Confidence: 0.9623204

00:36:52.855 --> 00:36:54.535 and, of course, early exposure

NOTE Confidence: 0.9623204

00:36:54.535 --> 00:36:55.275 to other,

NOTE Confidence: 0.8689047

00:36:56.960 --> 00:36:57.460 recreational,

NOTE Confidence: 0.9725464

00:36:58.160 --> 00:37:00.319 substances such as alcohol and

NOTE Confidence: 0.9725464

00:37:00.319 --> 00:37:00.819 tobacco.

NOTE Confidence: 0.9992568

00:37:01.440 --> 00:37:01.940 So

NOTE Confidence: 0.95332617

00:37:03.920 --> 00:37:06.160 adolescent use but also prenatal

NOTE Confidence: 0.95332617
00:37:06.160 --> 00:37:08.500 exposure is really critical for
NOTE Confidence: 0.95332617
00:37:08.559 --> 00:37:09.700 addiction risk.
NOTE Confidence: 0.85927963
00:37:10.485 --> 00:37:12.125 So at the we'll
NOTE Confidence: 0.88319194
00:37:12.565 --> 00:37:14.645 wanna end when I've talked
NOTE Confidence: 0.88319194
00:37:14.645 --> 00:37:15.545 about the pathways
NOTE Confidence: 0.96398133
00:37:15.925 --> 00:37:18.085 to substance use disorders, but
NOTE Confidence: 0.96398133
00:37:18.085 --> 00:37:20.425 what about ways to obviously
NOTE Confidence: 0.9929745
00:37:21.125 --> 00:37:22.185 get out of it?
NOTE Confidence: 0.97716045
00:37:22.850 --> 00:37:24.370 And I mentioned in the
NOTE Confidence: 0.97716045
00:37:24.370 --> 00:37:25.730 the beginning of the talk
NOTE Confidence: 0.97716045
00:37:25.730 --> 00:37:27.010 about, you know, obviously, this
NOTE Confidence: 0.97716045
00:37:27.010 --> 00:37:27.510 complex,
NOTE Confidence: 0.7794508
00:37:28.050 --> 00:37:29.030 cannabis plant
NOTE Confidence: 0.9558025
00:37:29.330 --> 00:37:30.930 and that it has over
NOTE Confidence: 0.9558025
00:37:30.930 --> 00:37:31.489 a hundred,
NOTE Confidence: 0.995407

00:37:32.850 --> 00:37:33.350 cannabinoids
NOTE Confidence: 0.96147233

00:37:33.650 --> 00:37:35.250 and other chemicals, the terpenes
NOTE Confidence: 0.96147233

00:37:35.250 --> 00:37:36.425 and so on, and that
NOTE Confidence: 0.96147233

00:37:36.425 --> 00:37:37.625 we still don't really know
NOTE Confidence: 0.96147233

00:37:37.625 --> 00:37:38.285 that much.
NOTE Confidence: 0.9991097

00:37:38.744 --> 00:37:39.244 But
NOTE Confidence: 0.97235256

00:37:39.545 --> 00:37:40.984 when we were conducting our
NOTE Confidence: 0.97235256

00:37:40.984 --> 00:37:42.525 human studies, we were always
NOTE Confidence: 0.97235256

00:37:42.744 --> 00:37:43.244 obviously
NOTE Confidence: 0.9748653

00:37:43.705 --> 00:37:45.165 looking at the whole plant.
NOTE Confidence: 0.9748653

00:37:45.385 --> 00:37:47.065 But when we conducted our
NOTE Confidence: 0.9748653

00:37:47.065 --> 00:37:48.585 animal studies, we mainly had
NOTE Confidence: 0.9748653

00:37:48.585 --> 00:37:49.645 studied THC.
NOTE Confidence: 0.9980773

00:37:50.185 --> 00:37:50.685 And
NOTE Confidence: 0.9954858

00:37:51.239 --> 00:37:53.180 we now add some CBD
NOTE Confidence: 0.9954858

00:37:53.320 --> 00:37:54.060 to our,

NOTE Confidence: 0.978508

00:37:54.760 --> 00:37:56.200 our animal models. But I

NOTE Confidence: 0.978508

00:37:56.200 --> 00:37:57.160 just wanted to know what

NOTE Confidence: 0.978508

00:37:57.160 --> 00:37:59.180 the CBD by itself do

NOTE Confidence: 0.978508

00:37:59.239 --> 00:38:01.080 to our animals. And in

NOTE Confidence: 0.978508

00:38:01.080 --> 00:38:02.060 regard to

NOTE Confidence: 0.9934619

00:38:02.360 --> 00:38:03.820 that question that we're initially

NOTE Confidence: 0.9460905

00:38:04.360 --> 00:38:06.540 exploring in terms of, does

NOTE Confidence: 0.9954978

00:38:07.125 --> 00:38:08.585 cannabis increase your sensitivities

NOTE Confidence: 0.9157499

00:38:08.885 --> 00:38:10.085 to other drugs such as

NOTE Confidence: 0.9157499

00:38:10.085 --> 00:38:11.525 opioids. And we always saw

NOTE Confidence: 0.9157499

00:38:11.525 --> 00:38:12.885 that we showed earlier that

NOTE Confidence: 0.9157499

00:38:12.885 --> 00:38:15.205 TFC would invariably increase heroin

NOTE Confidence: 0.9157499

00:38:15.205 --> 00:38:16.405 cell phone administration even though

NOTE Confidence: 0.9157499

00:38:16.405 --> 00:38:18.005 behavioral traits do matter for

NOTE Confidence: 0.9157499

00:38:18.005 --> 00:38:19.385 animals as they do also

NOTE Confidence: 0.97755426

00:38:19.685 --> 00:38:20.185 for
NOTE Confidence: 0.8045126
00:38:20.885 --> 00:38:21.625 for humans.
NOTE Confidence: 0.9769518
00:38:22.539 --> 00:38:23.900 But a strange thing happened
NOTE Confidence: 0.9769518
00:38:23.900 --> 00:38:25.339 when we first started to
NOTE Confidence: 0.9769518
00:38:25.339 --> 00:38:26.960 look at CBD before people
NOTE Confidence: 0.9769518
00:38:27.180 --> 00:38:29.039 even knew what CBD was,
NOTE Confidence: 0.9769518
00:38:29.259 --> 00:38:30.000 was that
NOTE Confidence: 0.9081552
00:38:31.339 --> 00:38:32.140 I don't know why my
NOTE Confidence: 0.9081552
00:38:32.299 --> 00:38:33.579 this mouse, like, the mouse
NOTE Confidence: 0.9081552
00:38:33.579 --> 00:38:34.480 is very sensitive.
NOTE Confidence: 0.96563226
00:38:35.484 --> 00:38:37.085 Such that when, you know,
NOTE Confidence: 0.96563226
00:38:37.085 --> 00:38:38.605 as I said, THC would
NOTE Confidence: 0.96563226
00:38:38.605 --> 00:38:40.204 mainly increase self administration, but
NOTE Confidence: 0.96563226
00:38:40.204 --> 00:38:41.645 we saw that CBD actually
NOTE Confidence: 0.96563226
00:38:41.645 --> 00:38:43.744 decreased heroin seeking in particular.
NOTE Confidence: 0.9360079
00:38:44.045 --> 00:38:45.165 It didn't change her in

NOTE Confidence: 0.9360079
00:38:45.165 --> 00:38:47.244 self administration behavior. But one
NOTE Confidence: 0.9360079
00:38:47.244 --> 00:38:48.285 of the things that happens
NOTE Confidence: 0.9360079
00:38:48.285 --> 00:38:49.665 is when animals
NOTE Confidence: 0.9744911
00:38:50.040 --> 00:38:51.640 learn to self administer the
NOTE Confidence: 0.9744911
00:38:51.640 --> 00:38:52.860 drug, just like humans,
NOTE Confidence: 0.9994522
00:38:53.400 --> 00:38:53.900 certain
NOTE Confidence: 0.98635876
00:38:54.440 --> 00:38:55.580 environmental cues
NOTE Confidence: 0.8647325
00:38:55.880 --> 00:38:56.700 take on
NOTE Confidence: 0.9218451
00:38:57.800 --> 00:38:59.020 a a conditioned aspect.
NOTE Confidence: 0.96298933
00:38:59.719 --> 00:39:01.320 They're more salient. And so
NOTE Confidence: 0.96298933
00:39:01.320 --> 00:39:02.440 here, for example, you could
NOTE Confidence: 0.96298933
00:39:02.440 --> 00:39:03.320 have a light or a
NOTE Confidence: 0.96298933
00:39:03.320 --> 00:39:04.140 tone or,
NOTE Confidence: 0.9981644
00:39:04.760 --> 00:39:05.420 a smell
NOTE Confidence: 0.9840383
00:39:05.825 --> 00:39:07.205 when they get the drug.
NOTE Confidence: 0.9840383

00:39:07.425 --> 00:39:08.305 And if you show them
NOTE Confidence: 0.9840383

00:39:08.305 --> 00:39:09.585 that cue, even when they
NOTE Confidence: 0.9840383

00:39:09.585 --> 00:39:10.465 don't get the drug, they
NOTE Confidence: 0.9840383

00:39:10.465 --> 00:39:11.605 will press the lever,
NOTE Confidence: 0.9707076

00:39:12.145 --> 00:39:13.025 trying to get the drug,
NOTE Confidence: 0.9707076

00:39:13.025 --> 00:39:14.245 and that's what we we,
NOTE Confidence: 0.9902791

00:39:15.025 --> 00:39:17.125 frame as drug seeking behavior.
NOTE Confidence: 0.9902791

00:39:17.265 --> 00:39:18.385 And that's what's what we
NOTE Confidence: 0.9902791

00:39:18.385 --> 00:39:19.285 saw with CBD
NOTE Confidence: 0.98605573

00:39:20.100 --> 00:39:20.600 that,
NOTE Confidence: 0.9448554

00:39:21.380 --> 00:39:22.980 that even the day after
NOTE Confidence: 0.9448554

00:39:22.980 --> 00:39:24.980 they got their the the
NOTE Confidence: 0.9448554

00:39:24.980 --> 00:39:25.720 last CBD,
NOTE Confidence: 0.942033

00:39:26.660 --> 00:39:27.780 even if it did not
NOTE Confidence: 0.942033

00:39:27.780 --> 00:39:29.060 change their acute if they
NOTE Confidence: 0.942033

00:39:29.060 --> 00:39:30.920 were already self administering heroin,

NOTE Confidence: 0.942033
00:39:30.980 --> 00:39:32.100 the next day, it was
NOTE Confidence: 0.942033
00:39:32.100 --> 00:39:34.040 decreasing their heroin seeking behavior.
NOTE Confidence: 0.93238467
00:39:34.994 --> 00:39:36.454 We have studied the postmortem
NOTE Confidence: 0.93238467
00:39:36.515 --> 00:39:37.474 human brain a lot, and
NOTE Confidence: 0.93238467
00:39:37.474 --> 00:39:38.515 we know that there are
NOTE Confidence: 0.93238467
00:39:38.515 --> 00:39:39.634 all of these, you know,
NOTE Confidence: 0.93238467
00:39:39.634 --> 00:39:41.335 significant changes that are occurring,
NOTE Confidence: 0.8758292
00:39:41.875 --> 00:39:43.075 especially on the blood meturtic
NOTE Confidence: 0.8758292
00:39:43.075 --> 00:39:44.594 transmission and so on. And
NOTE Confidence: 0.8758292
00:39:44.594 --> 00:39:45.795 we could actually in our
NOTE Confidence: 0.8758292
00:39:45.795 --> 00:39:47.154 animal models that had been
NOTE Confidence: 0.8758292
00:39:47.154 --> 00:39:47.654 given,
NOTE Confidence: 0.8594063
00:39:49.540 --> 00:39:51.219 had taken self administered heroin
NOTE Confidence: 0.8594063
00:39:51.219 --> 00:39:52.680 and we see these synaptic
NOTE Confidence: 0.9300681
00:39:52.980 --> 00:39:54.660 pluses in the related genes,
NOTE Confidence: 0.9300681

00:39:54.660 --> 00:39:56.020 that CBD actually we saw
NOTE Confidence: 0.9300681

00:39:56.020 --> 00:39:57.880 that it normalized those individual
NOTE Confidence: 0.9300681

00:39:58.099 --> 00:39:59.140 genes that we studied at
NOTE Confidence: 0.9300681

00:39:59.140 --> 00:39:59.800 that time.
NOTE Confidence: 0.9846212

00:40:00.485 --> 00:40:01.765 So we thought, okay. Let's
NOTE Confidence: 0.9846212

00:40:01.765 --> 00:40:03.625 see whether or not CBD
NOTE Confidence: 0.83234924

00:40:04.165 --> 00:40:05.545 might be, a
NOTE Confidence: 0.9397368

00:40:05.844 --> 00:40:07.605 useful as a potential treatment
NOTE Confidence: 0.9397368

00:40:07.605 --> 00:40:08.985 for opioid use disorder.
NOTE Confidence: 0.99547017

00:40:10.325 --> 00:40:12.165 Excuse me. And so we
NOTE Confidence: 0.99547017

00:40:12.165 --> 00:40:13.605 did some pilot studies where
NOTE Confidence: 0.99547017

00:40:13.605 --> 00:40:15.065 we just did double blinded
NOTE Confidence: 0.96270156

00:40:15.480 --> 00:40:16.700 randomized placebo control
NOTE Confidence: 0.9586213

00:40:17.480 --> 00:40:19.000 in individuals. These were absent
NOTE Confidence: 0.9586213

00:40:19.000 --> 00:40:19.500 individuals
NOTE Confidence: 0.9544293

00:40:20.440 --> 00:40:21.640 who, were,

NOTE Confidence: 0.7969659
00:40:22.119 --> 00:40:23.180 had a opioid,
NOTE Confidence: 0.9043114
00:40:23.640 --> 00:40:25.400 then heroin use disorder. And
NOTE Confidence: 0.9043114
00:40:25.400 --> 00:40:26.540 we looked at two doses
NOTE Confidence: 0.9043114
00:40:26.680 --> 00:40:28.060 and just did short term
NOTE Confidence: 0.9043114
00:40:28.119 --> 00:40:29.580 exposure to c CBD.
NOTE Confidence: 0.9573887
00:40:30.965 --> 00:40:32.245 And what we saw was
NOTE Confidence: 0.9573887
00:40:32.245 --> 00:40:33.285 similar to what we saw
NOTE Confidence: 0.9573887
00:40:33.285 --> 00:40:34.825 in the humans, but
NOTE Confidence: 0.8932766
00:40:35.765 --> 00:40:36.665 excuse me.
NOTE Confidence: 0.9419501
00:40:37.364 --> 00:40:38.245 Similar to what we saw
NOTE Confidence: 0.9419501
00:40:38.245 --> 00:40:39.525 in our rats, well, our
NOTE Confidence: 0.9419501
00:40:39.525 --> 00:40:41.364 rats didn't get didn't get,
NOTE Confidence: 0.92569804
00:40:42.005 --> 00:40:43.670 videos or even,
NOTE Confidence: 0.9007821
00:40:44.130 --> 00:40:45.489 participants were shown either a
NOTE Confidence: 0.9007821
00:40:45.489 --> 00:40:46.609 neutral video or a heroin
NOTE Confidence: 0.9007821

00:40:46.609 --> 00:40:47.809 video. And those who had
NOTE Confidence: 0.9007821

00:40:47.809 --> 00:40:48.710 received placebo,
NOTE Confidence: 0.9799402

00:40:49.809 --> 00:40:51.730 they showed increased craving, and
NOTE Confidence: 0.9799402

00:40:51.730 --> 00:40:53.190 CBD reduced that.
NOTE Confidence: 0.9502759

00:40:53.489 --> 00:40:55.010 Our animal model had also
NOTE Confidence: 0.9502759

00:40:55.010 --> 00:40:56.130 told us one thing that's
NOTE Confidence: 0.9502759

00:40:56.130 --> 00:40:57.329 why it was interesting for
NOTE Confidence: 0.9502759

00:40:57.329 --> 00:40:57.829 me,
NOTE Confidence: 0.8784206

00:40:58.745 --> 00:40:59.245 CBD,
NOTE Confidence: 0.99756074

00:40:59.625 --> 00:41:00.985 was that even a few
NOTE Confidence: 0.99756074

00:41:00.985 --> 00:41:02.525 weeks after their last CBD
NOTE Confidence: 0.99756074

00:41:02.745 --> 00:41:03.245 administration,
NOTE Confidence: 0.98124033

00:41:03.864 --> 00:41:05.145 it was still reducing their
NOTE Confidence: 0.98124033

00:41:05.145 --> 00:41:07.385 cue induced, seeking behavior. And
NOTE Confidence: 0.98124033

00:41:07.385 --> 00:41:08.585 when we brought people back
NOTE Confidence: 0.98124033

00:41:08.585 --> 00:41:09.705 in the lab a week

NOTE Confidence: 0.98124033
00:41:09.705 --> 00:41:11.645 later, CBD was still reducing,
NOTE Confidence: 0.9380295
00:41:12.500 --> 00:41:14.339 their cravings compared to the
NOTE Confidence: 0.9380295
00:41:14.339 --> 00:41:14.839 placebo.
NOTE Confidence: 0.97777545
00:41:16.980 --> 00:41:18.420 What our animals didn't tell
NOTE Confidence: 0.97777545
00:41:18.420 --> 00:41:19.460 us at that time, but
NOTE Confidence: 0.97777545
00:41:19.460 --> 00:41:21.559 our our human study participants
NOTE Confidence: 0.97777545
00:41:21.700 --> 00:41:23.079 did, was that
NOTE Confidence: 0.99849224
00:41:23.540 --> 00:41:24.040 actually,
NOTE Confidence: 0.8774538
00:41:24.660 --> 00:41:26.420 CBD, when they've shown the
NOTE Confidence: 0.8774538
00:41:26.420 --> 00:41:26.920 the
NOTE Confidence: 0.9386264
00:41:27.714 --> 00:41:28.915 heroin cue and they've gotten
NOTE Confidence: 0.9386264
00:41:28.915 --> 00:41:31.155 placebo, their anxiety increased, and
NOTE Confidence: 0.9386264
00:41:31.155 --> 00:41:32.535 CBD reduced that.
NOTE Confidence: 0.99833035
00:41:33.474 --> 00:41:34.515 A week later, it was
NOTE Confidence: 0.99833035
00:41:34.515 --> 00:41:35.655 still reducing that.
NOTE Confidence: 0.99387234

00:41:36.755 --> 00:41:37.974 We also studied,
NOTE Confidence: 0.95518774
00:41:38.515 --> 00:41:40.275 not just their subjective measures,
NOTE Confidence: 0.95518774
00:41:40.275 --> 00:41:41.734 but physiological measures,
NOTE Confidence: 0.87736845
00:41:42.300 --> 00:41:43.440 for example, cortisol.
NOTE Confidence: 0.95183307
00:41:43.820 --> 00:41:45.120 And we could see that,
NOTE Confidence: 0.9670245
00:41:46.540 --> 00:41:47.920 when they were given placebo,
NOTE Confidence: 0.9670245
00:41:48.140 --> 00:41:49.500 their cortisol levels went up
NOTE Confidence: 0.9670245
00:41:49.500 --> 00:41:50.380 when they got the drug
NOTE Confidence: 0.9670245
00:41:50.380 --> 00:41:52.160 cue and CBD reduced it.
NOTE Confidence: 0.9834334
00:41:52.540 --> 00:41:53.500 The same thing with their
NOTE Confidence: 0.9834334
00:41:53.500 --> 00:41:54.460 heart rate. When they saw
NOTE Confidence: 0.9834334
00:41:54.460 --> 00:41:55.360 the drug cue,
NOTE Confidence: 0.939899
00:41:56.015 --> 00:41:56.975 their heart rate went up
NOTE Confidence: 0.939899
00:41:56.975 --> 00:41:58.515 and CBD reduced that.
NOTE Confidence: 0.9357281
00:42:00.175 --> 00:42:01.875 We now just finished
NOTE Confidence: 0.9351168
00:42:02.175 --> 00:42:03.695 a double blinded phase two

NOTE Confidence: 0.9351168
00:42:03.695 --> 00:42:05.775 study with individuals' opioid use
NOTE Confidence: 0.9351168
00:42:05.775 --> 00:42:06.275 disorders,
NOTE Confidence: 0.9486178
00:42:06.735 --> 00:42:08.815 and they're, maintained on,
NOTE Confidence: 0.97327584
00:42:09.215 --> 00:42:10.594 opioid agonist therapy.
NOTE Confidence: 0.9585008
00:42:11.020 --> 00:42:12.000 This is just preliminary
NOTE Confidence: 0.9061541
00:42:12.300 --> 00:42:13.500 unpublished, and this was just
NOTE Confidence: 0.9061541
00:42:13.500 --> 00:42:15.100 an interim small analysis that
NOTE Confidence: 0.9061541
00:42:15.100 --> 00:42:15.760 we were,
NOTE Confidence: 0.84228414
00:42:16.300 --> 00:42:17.120 had to do.
NOTE Confidence: 0.939608
00:42:17.739 --> 00:42:18.780 But the thing I noticed
NOTE Confidence: 0.939608
00:42:18.860 --> 00:42:19.820 so that's one brief thing
NOTE Confidence: 0.939608
00:42:19.820 --> 00:42:20.780 that we also see that
NOTE Confidence: 0.939608
00:42:20.780 --> 00:42:22.700 it replicates in part what
NOTE Confidence: 0.939608
00:42:22.700 --> 00:42:24.475 we saw. So for example,
NOTE Confidence: 0.939608
00:42:24.614 --> 00:42:26.055 individuals who are in placebo,
NOTE Confidence: 0.939608

00:42:26.055 --> 00:42:26.935 they spend a lot of
NOTE Confidence: 0.939608
00:42:26.935 --> 00:42:28.614 time in a stressful state,
NOTE Confidence: 0.939608
00:42:28.614 --> 00:42:29.975 and this is now their
NOTE Confidence: 0.939608
00:42:30.295 --> 00:42:31.415 in their real world, not
NOTE Confidence: 0.939608
00:42:31.415 --> 00:42:32.855 just in our lab, and
NOTE Confidence: 0.939608
00:42:32.855 --> 00:42:34.155 just looking at their biometric,
NOTE Confidence: 0.9112074
00:42:35.255 --> 00:42:36.715 assessments. And CBD
NOTE Confidence: 0.97373384
00:42:37.119 --> 00:42:38.480 now reverses that, having them
NOTE Confidence: 0.97373384
00:42:38.480 --> 00:42:39.520 spend more time in the
NOTE Confidence: 0.97373384
00:42:39.520 --> 00:42:40.420 normal state.
NOTE Confidence: 0.9871292
00:42:42.880 --> 00:42:44.239 So now we're going back
NOTE Confidence: 0.9871292
00:42:44.239 --> 00:42:45.680 into our animal models after
NOTE Confidence: 0.9871292
00:42:45.839 --> 00:42:47.440 you know, with our following
NOTE Confidence: 0.9871292
00:42:47.440 --> 00:42:48.080 our human,
NOTE Confidence: 0.9087151
00:42:48.480 --> 00:42:50.400 results. And my postdoc, Alex
NOTE Confidence: 0.9087151
00:42:50.400 --> 00:42:52.375 Chosum, is looking into CBD.

NOTE Confidence: 0.9087151
00:42:52.375 --> 00:42:53.654 Does it you know, again,
NOTE Confidence: 0.9087151
00:42:53.654 --> 00:42:54.055 can,
NOTE Confidence: 0.8781624
00:42:54.535 --> 00:42:56.214 reduce her seeking behavior? She
NOTE Confidence: 0.8781624
00:42:56.214 --> 00:42:57.414 was able to replicate what
NOTE Confidence: 0.8781624
00:42:57.414 --> 00:42:59.894 we had seen before and
NOTE Confidence: 0.8781624
00:42:59.894 --> 00:43:01.494 also seen it also we
NOTE Confidence: 0.8781624
00:43:01.494 --> 00:43:02.855 had studied male and males
NOTE Confidence: 0.8781624
00:43:02.855 --> 00:43:04.135 at that time, also seen
NOTE Confidence: 0.8781624
00:43:04.135 --> 00:43:04.795 in females.
NOTE Confidence: 0.912201
00:43:05.930 --> 00:43:06.970 But one of the things,
NOTE Confidence: 0.912201
00:43:06.970 --> 00:43:08.250 as I said, our study
NOTE Confidence: 0.912201
00:43:08.250 --> 00:43:09.770 participant, you know, they told
NOTE Confidence: 0.912201
00:43:09.770 --> 00:43:10.489 us that we could see
NOTE Confidence: 0.912201
00:43:10.489 --> 00:43:12.250 their anxiety like behavior. And
NOTE Confidence: 0.912201
00:43:12.250 --> 00:43:13.530 Jackie, when she first started
NOTE Confidence: 0.912201

00:43:13.530 --> 00:43:14.410 the postdoc, I said, oh,
NOTE Confidence: 0.912201

00:43:14.410 --> 00:43:15.370 I just have a small
NOTE Confidence: 0.912201

00:43:15.370 --> 00:43:16.890 short study for you to
NOTE Confidence: 0.912201

00:43:16.890 --> 00:43:17.790 look at anxiety
NOTE Confidence: 0.8915615

00:43:18.375 --> 00:43:19.815 CBD effects and anxiety like
NOTE Confidence: 0.8915615

00:43:19.815 --> 00:43:21.915 behavior. And here, we actually
NOTE Confidence: 0.8915615

00:43:22.055 --> 00:43:22.555 toned,
NOTE Confidence: 0.94577295

00:43:24.135 --> 00:43:25.575 we we gave a shock
NOTE Confidence: 0.94577295

00:43:25.575 --> 00:43:27.255 for the the induced anxiety
NOTE Confidence: 0.94577295

00:43:27.255 --> 00:43:28.775 like behavior and and paired
NOTE Confidence: 0.94577295

00:43:28.775 --> 00:43:30.535 it with a lemon odor.
NOTE Confidence: 0.94577295

00:43:30.535 --> 00:43:31.995 And when animals were,
NOTE Confidence: 0.94752616

00:43:32.780 --> 00:43:34.780 given the lemon odor and
NOTE Confidence: 0.94752616

00:43:34.780 --> 00:43:35.900 they had been given the
NOTE Confidence: 0.94752616

00:43:35.900 --> 00:43:37.980 vehicle, they showed much greater
NOTE Confidence: 0.94752616

00:43:37.980 --> 00:43:40.000 anxiety like behavior and CBD

NOTE Confidence: 0.9578693
00:43:40.380 --> 00:43:41.980 reduced that. So similar to
NOTE Confidence: 0.9578693
00:43:41.980 --> 00:43:43.260 what our human subjects have
NOTE Confidence: 0.9578693
00:43:43.260 --> 00:43:43.920 told us.
NOTE Confidence: 0.98197657
00:43:44.475 --> 00:43:45.675 So now looking into the
NOTE Confidence: 0.98197657
00:43:45.675 --> 00:43:46.175 neurobiology,
NOTE Confidence: 0.9828051
00:43:46.715 --> 00:43:48.715 for example, looking into, like,
NOTE Confidence: 0.9828051
00:43:48.715 --> 00:43:50.395 the nucleus accumbens here, we
NOTE Confidence: 0.9828051
00:43:50.395 --> 00:43:51.755 can see one thing that
NOTE Confidence: 0.9828051
00:43:51.755 --> 00:43:53.535 is clear is that
NOTE Confidence: 0.94308484
00:43:53.835 --> 00:43:55.595 parent seeking behavior will increase
NOTE Confidence: 0.94308484
00:43:55.595 --> 00:43:57.435 and decrease genes as one
NOTE Confidence: 0.94308484
00:43:57.435 --> 00:43:59.275 would expect, and CBD tends
NOTE Confidence: 0.94308484
00:43:59.275 --> 00:44:01.380 to reverse or normalize that.
NOTE Confidence: 0.94308484
00:44:01.380 --> 00:44:03.060 Similarly, with the anxiety like
NOTE Confidence: 0.94308484
00:44:03.060 --> 00:44:03.560 behavior,
NOTE Confidence: 0.9400976

00:44:05.060 --> 00:44:06.680 and there are some shared
NOTE Confidence: 0.9400976

00:44:06.739 --> 00:44:07.239 behavioral,
NOTE Confidence: 0.97674537

00:44:09.460 --> 00:44:11.219 shared behavioral processes that are
NOTE Confidence: 0.97674537

00:44:11.219 --> 00:44:13.140 are changed between the heroin
NOTE Confidence: 0.97674537

00:44:13.140 --> 00:44:13.800 and anxiety
NOTE Confidence: 0.9421539

00:44:15.204 --> 00:44:16.325 behavior. I'm not gonna go
NOTE Confidence: 0.9421539

00:44:16.325 --> 00:44:17.464 so much into the anxiety
NOTE Confidence: 0.9421539

00:44:17.684 --> 00:44:19.204 results. We actually just published
NOTE Confidence: 0.9421539

00:44:19.204 --> 00:44:21.364 that in molecular psychiatry. But
NOTE Confidence: 0.9421539

00:44:21.364 --> 00:44:23.444 I wanna show one thing
NOTE Confidence: 0.9421539

00:44:23.444 --> 00:44:24.805 is that what we do
NOTE Confidence: 0.9421539

00:44:24.805 --> 00:44:26.105 see in terms of what's
NOTE Confidence: 0.9421539

00:44:26.325 --> 00:44:27.765 changed in, for example, the
NOTE Confidence: 0.9421539

00:44:27.765 --> 00:44:29.180 nucleus accumbens, we We see
NOTE Confidence: 0.9421539

00:44:29.180 --> 00:44:30.320 changes also amygdala,
NOTE Confidence: 0.97535217

00:44:30.620 --> 00:44:31.120 prefrontal

NOTE Confidence: 0.86305976
00:44:31.900 --> 00:44:33.660 cortex. There are differentially expressed
NOTE Confidence: 0.86305976
00:44:33.660 --> 00:44:34.940 genes of the strongest showing
NOTE Confidence: 0.86305976
00:44:34.940 --> 00:44:36.400 a very a small amount
NOTE Confidence: 0.88119936
00:44:36.780 --> 00:44:38.560 and in their upstream regulators.
NOTE Confidence: 0.9711516
00:44:39.100 --> 00:44:40.540 And what has changed with
NOTE Confidence: 0.9711516
00:44:40.540 --> 00:44:42.060 heroin seeking behaviors, a lot
NOTE Confidence: 0.9711516
00:44:42.060 --> 00:44:44.160 of these extracellular matrix, how
NOTE Confidence: 0.9711516
00:44:44.405 --> 00:44:45.385 how cells
NOTE Confidence: 0.8198693
00:44:45.925 --> 00:44:46.425 communicate,
NOTE Confidence: 0.9461136
00:44:46.805 --> 00:44:47.704 and these neuroinflammatory
NOTE Confidence: 0.9824319
00:44:48.405 --> 00:44:49.625 biological processes.
NOTE Confidence: 0.99913764
00:44:50.405 --> 00:44:51.464 And CBD
NOTE Confidence: 0.97651637
00:44:52.325 --> 00:44:54.405 normalizes those, not just on
NOTE Confidence: 0.97651637
00:44:54.405 --> 00:44:56.005 the the individual genes, but
NOTE Confidence: 0.97651637
00:44:56.005 --> 00:44:56.984 even these upstream
NOTE Confidence: 0.9956622

00:44:57.285 --> 00:44:57.785 regulators.
NOTE Confidence: 0.9187026

00:44:58.405 --> 00:44:59.145 But importantly,
NOTE Confidence: 0.8729533

00:45:01.580 --> 00:45:02.239 these changes
NOTE Confidence: 0.98936427

00:45:02.700 --> 00:45:04.960 correlate with heroin seeking behavior.
NOTE Confidence: 0.96391517

00:45:06.060 --> 00:45:07.760 So we are getting optimistic
NOTE Confidence: 0.905561

00:45:08.140 --> 00:45:08.640 that,
NOTE Confidence: 0.9995002

00:45:10.460 --> 00:45:11.739 the changes that we are
NOTE Confidence: 0.9995002

00:45:11.739 --> 00:45:12.239 seeing
NOTE Confidence: 0.9834786

00:45:12.700 --> 00:45:13.920 in in,
NOTE Confidence: 0.99914163

00:45:14.380 --> 00:45:15.040 with CBD
NOTE Confidence: 0.96834403

00:45:16.674 --> 00:45:18.035 in our humans that we
NOTE Confidence: 0.96834403

00:45:18.035 --> 00:45:19.555 now can replicate in our
NOTE Confidence: 0.96834403

00:45:19.714 --> 00:45:21.075 on the behavioral level in
NOTE Confidence: 0.96834403

00:45:21.075 --> 00:45:22.515 our animals, and we can
NOTE Confidence: 0.96834403

00:45:22.515 --> 00:45:24.775 see now the specific biological
NOTE Confidence: 0.96834403

00:45:24.914 --> 00:45:27.155 networks where CBD might be,

NOTE Confidence: 0.96834403
00:45:27.395 --> 00:45:29.315 working. So we're working hard
NOTE Confidence: 0.96834403
00:45:29.315 --> 00:45:31.255 to translate CBD for treatment.
NOTE Confidence: 0.991797
00:45:31.590 --> 00:45:32.570 We have a neuroimaging
NOTE Confidence: 0.9868249
00:45:32.950 --> 00:45:33.430 study,
NOTE Confidence: 0.8151603
00:45:33.910 --> 00:45:34.410 ongoing,
NOTE Confidence: 0.9470394
00:45:34.950 --> 00:45:36.070 and we just finished the
NOTE Confidence: 0.9470394
00:45:36.070 --> 00:45:37.030 phase two, as I said,
NOTE Confidence: 0.9470394
00:45:37.030 --> 00:45:38.790 and starting phase three looking
NOTE Confidence: 0.9470394
00:45:38.790 --> 00:45:39.530 at cannabidiol
NOTE Confidence: 0.98297703
00:45:39.910 --> 00:45:41.190 in as a potential treatment
NOTE Confidence: 0.98297703
00:45:41.190 --> 00:45:42.489 for opioid use disorder.
NOTE Confidence: 0.998727
00:45:43.030 --> 00:45:43.530 So
NOTE Confidence: 0.99592906
00:45:43.925 --> 00:45:44.425 in
NOTE Confidence: 0.92571306
00:45:45.125 --> 00:45:46.725 summarizing a lot in terms
NOTE Confidence: 0.92571306
00:45:46.725 --> 00:45:47.945 of clearly
NOTE Confidence: 0.9893025

00:45:48.645 --> 00:45:49.864 prenatal exposure
NOTE Confidence: 0.98665065

00:45:50.885 --> 00:45:52.665 to cannabis and the THC
NOTE Confidence: 0.9511007

00:45:52.965 --> 00:45:54.244 potency, the dose, and the
NOTE Confidence: 0.9511007

00:45:54.244 --> 00:45:55.925 frequency makes a big impact,
NOTE Confidence: 0.9511007

00:45:55.925 --> 00:45:57.205 but so does the stress
NOTE Confidence: 0.9511007

00:45:57.205 --> 00:45:57.660 and,
NOTE Confidence: 0.9327209

00:45:58.059 --> 00:45:59.359 and biological sex.
NOTE Confidence: 0.92929757

00:45:59.819 --> 00:46:01.520 We also see that epigenetic
NOTE Confidence: 0.92929757

00:46:01.660 --> 00:46:03.020 mechanisms play a really key
NOTE Confidence: 0.92929757

00:46:03.020 --> 00:46:04.559 role on the synaptic plasticity
NOTE Confidence: 0.92929757

00:46:04.780 --> 00:46:05.819 and and the number of
NOTE Confidence: 0.92929757

00:46:05.819 --> 00:46:06.319 these
NOTE Confidence: 0.7774091

00:46:06.619 --> 00:46:07.119 neuroimmune
NOTE Confidence: 0.98295975

00:46:07.660 --> 00:46:08.059 and,
NOTE Confidence: 0.99228305

00:46:08.700 --> 00:46:10.539 certain metabolic processes in the
NOTE Confidence: 0.99228305

00:46:10.539 --> 00:46:11.980 cell that seems to be

NOTE Confidence: 0.99228305
00:46:11.980 --> 00:46:12.799 certain targets
NOTE Confidence: 0.9894036
00:46:13.265 --> 00:46:14.864 that CBD seems to be
NOTE Confidence: 0.9894036
00:46:14.864 --> 00:46:16.385 impacting, and we we'll see
NOTE Confidence: 0.9894036
00:46:16.385 --> 00:46:17.425 whether or not it may
NOTE Confidence: 0.9894036
00:46:17.425 --> 00:46:18.785 be effective as a potential
NOTE Confidence: 0.9894036
00:46:18.785 --> 00:46:19.285 treatment.
NOTE Confidence: 0.91563547
00:46:19.665 --> 00:46:20.785 So with that, I'll thank
NOTE Confidence: 0.91563547
00:46:20.785 --> 00:46:21.825 a lot of people. Yoko
NOTE Confidence: 0.91563547
00:46:21.825 --> 00:46:23.185 no more was incredible. It's
NOTE Confidence: 0.91563547
00:46:23.185 --> 00:46:24.705 a very difficult study. I'm
NOTE Confidence: 0.91563547
00:46:24.705 --> 00:46:26.579 not gonna lie. These prenatal
NOTE Confidence: 0.91563547
00:46:26.719 --> 00:46:28.260 studies have longitudinal effect,
NOTE Confidence: 0.9916645
00:46:28.799 --> 00:46:30.339 in in our human population.
NOTE Confidence: 0.84634817
00:46:31.920 --> 00:46:32.960 The I've shown some of
NOTE Confidence: 0.84634817
00:46:32.960 --> 00:46:34.239 the postdocs their work and
NOTE Confidence: 0.84634817

00:46:34.239 --> 00:46:35.859 their students have been amazing.

NOTE Confidence: 0.993798

00:46:36.400 --> 00:46:36.799 And,

NOTE Confidence: 0.89215755

00:46:37.280 --> 00:46:38.799 Karen Bakke and our whole,

NOTE Confidence: 0.9945099

00:46:39.285 --> 00:46:41.364 clinical research team, it really

NOTE Confidence: 0.9945099

00:46:41.364 --> 00:46:42.724 does take a huge village

NOTE Confidence: 0.9945099

00:46:42.724 --> 00:46:43.305 to do,

NOTE Confidence: 0.9382265

00:46:43.684 --> 00:46:44.885 these studies. So I'll stop

NOTE Confidence: 0.9382265

00:46:44.885 --> 00:46:45.844 there as we're gonna look

NOTE Confidence: 0.9382265

00:46:45.844 --> 00:46:46.885 at time and so that

NOTE Confidence: 0.9382265

00:46:46.885 --> 00:46:48.105 we can have time for,

NOTE Confidence: 0.9997393

00:46:48.565 --> 00:46:49.065 questions.

NOTE Confidence: 0.9592352

00:46:51.810 --> 00:46:53.170 Well, thank you, Yasmin. That

NOTE Confidence: 0.9592352

00:46:53.170 --> 00:46:54.930 was amazing. You covered a

NOTE Confidence: 0.9592352

00:46:54.930 --> 00:46:56.150 lot of ground and,

NOTE Confidence: 0.9533281

00:46:57.489 --> 00:46:59.010 with staggering amount of data

NOTE Confidence: 0.9533281

00:46:59.010 --> 00:47:00.370 that you presented. So thank

NOTE Confidence: 0.9533281
00:47:00.370 --> 00:47:00.870 you.
NOTE Confidence: 0.95405173
00:47:01.330 --> 00:47:02.530 I'm I'm not gonna take
NOTE Confidence: 0.95405173
00:47:02.530 --> 00:47:03.730 up much time. I'm gonna
NOTE Confidence: 0.95405173
00:47:03.730 --> 00:47:05.330 let people ask questions. You
NOTE Confidence: 0.95405173
00:47:05.330 --> 00:47:06.894 have a the first question
NOTE Confidence: 0.95405173
00:47:06.894 --> 00:47:08.335 is from a former mentee
NOTE Confidence: 0.95405173
00:47:08.335 --> 00:47:08.914 of yours.
NOTE Confidence: 0.9447332
00:47:10.255 --> 00:47:11.555 Anahita, you wanna
NOTE Confidence: 0.9671241
00:47:11.934 --> 00:47:13.474 unmute and ask your question?
NOTE Confidence: 0.99815524
00:47:14.174 --> 00:47:14.674 Sure.
NOTE Confidence: 0.94689333
00:47:15.535 --> 00:47:16.194 I'm sorry.
NOTE Confidence: 0.95025444
00:47:16.654 --> 00:47:17.934 Hi, Yasmin, and thank you
NOTE Confidence: 0.95025444
00:47:17.934 --> 00:47:18.894 so much for the great
NOTE Confidence: 0.95025444
00:47:18.894 --> 00:47:19.855 talk, and good to see
NOTE Confidence: 0.95025444
00:47:19.855 --> 00:47:20.434 you here.
NOTE Confidence: 0.97736806

00:47:21.700 --> 00:47:22.760 Basically, my question
NOTE Confidence: 0.95092523

00:47:23.140 --> 00:47:25.000 is about the impact of
NOTE Confidence: 0.8916348

00:47:25.540 --> 00:47:26.520 THC exposure
NOTE Confidence: 0.9284935

00:47:26.820 --> 00:47:28.280 or trauma and stress.
NOTE Confidence: 0.94935226

00:47:29.460 --> 00:47:31.540 In early adult early childhood
NOTE Confidence: 0.94935226

00:47:31.540 --> 00:47:32.600 compared to adolescence
NOTE Confidence: 0.9338039

00:47:32.900 --> 00:47:33.940 because we know there is,
NOTE Confidence: 0.9338039

00:47:33.940 --> 00:47:35.080 like, different developmental
NOTE Confidence: 0.96762156

00:47:35.380 --> 00:47:36.360 periods. So
NOTE Confidence: 0.99959123

00:47:36.675 --> 00:47:38.375 do we have any evidence
NOTE Confidence: 0.9433219

00:47:38.675 --> 00:47:40.195 that can compare these two
NOTE Confidence: 0.9433219

00:47:40.195 --> 00:47:40.695 periods?
NOTE Confidence: 0.89345485

00:47:41.795 --> 00:47:43.395 I'm good. I have not
NOTE Confidence: 0.89345485

00:47:43.395 --> 00:47:43.895 compared
NOTE Confidence: 0.9997054

00:47:44.355 --> 00:47:45.335 the two periods
NOTE Confidence: 0.9957779

00:47:45.875 --> 00:47:47.395 with the same type of

NOTE Confidence: 0.9957779
00:47:47.395 --> 00:47:47.895 stressors,
NOTE Confidence: 0.97854465
00:47:48.195 --> 00:47:49.590 and that's the thing. You
NOTE Confidence: 0.97854465
00:47:49.590 --> 00:47:51.270 know? So I can't say
NOTE Confidence: 0.97854465
00:47:51.270 --> 00:47:52.250 that we we,
NOTE Confidence: 0.9677164
00:47:52.870 --> 00:47:54.310 that they're equal in terms
NOTE Confidence: 0.9677164
00:47:54.310 --> 00:47:55.190 of the stress that we
NOTE Confidence: 0.9677164
00:47:55.190 --> 00:47:56.170 give to our our
NOTE Confidence: 0.9210695
00:47:56.550 --> 00:47:58.070 adolescents, to the stress that
NOTE Confidence: 0.9210695
00:47:58.070 --> 00:47:58.790 we give to
NOTE Confidence: 0.9808533
00:47:59.510 --> 00:48:01.190 I I realized a slide
NOTE Confidence: 0.9808533
00:48:01.190 --> 00:48:03.030 was missing where we now
NOTE Confidence: 0.9808533
00:48:03.030 --> 00:48:03.530 have
NOTE Confidence: 0.99596995
00:48:06.125 --> 00:48:07.425 the animals actually
NOTE Confidence: 0.55934215
00:48:08.205 --> 00:48:08.705 consume
NOTE Confidence: 0.9776918
00:48:09.085 --> 00:48:10.844 THC themselves. So in terms
NOTE Confidence: 0.9776918

00:48:10.844 --> 00:48:11.344 of,
NOTE Confidence: 0.9394791
00:48:11.885 --> 00:48:13.585 they and we use edibles
NOTE Confidence: 0.9394791
00:48:13.724 --> 00:48:14.785 because it's much
NOTE Confidence: 0.94137174
00:48:15.645 --> 00:48:17.805 easier. And the animals will
NOTE Confidence: 0.94137174
00:48:17.805 --> 00:48:18.305 definitely,
NOTE Confidence: 0.8605582
00:48:19.565 --> 00:48:20.625 consume the edibles,
NOTE Confidence: 0.908308
00:48:21.060 --> 00:48:21.560 But,
NOTE Confidence: 0.99975
00:48:21.940 --> 00:48:22.840 again, stress
NOTE Confidence: 0.9950777
00:48:23.300 --> 00:48:24.360 increases that.
NOTE Confidence: 0.8738409
00:48:24.660 --> 00:48:25.320 So there,
NOTE Confidence: 0.9993002
00:48:25.860 --> 00:48:26.900 but it's not the same
NOTE Confidence: 0.9993002
00:48:26.900 --> 00:48:28.100 type of stress that we
NOTE Confidence: 0.9993002
00:48:28.100 --> 00:48:29.800 have in our prenatal
NOTE Confidence: 0.9914962
00:48:30.100 --> 00:48:30.600 model.
NOTE Confidence: 0.9989241
00:48:30.900 --> 00:48:31.400 So
NOTE Confidence: 0.9778484
00:48:31.860 --> 00:48:33.140 but I think it is

NOTE Confidence: 0.9778484
00:48:33.380 --> 00:48:34.724 you know, there are people
NOTE Confidence: 0.9778484
00:48:34.724 --> 00:48:35.844 now looking, I think, more
NOTE Confidence: 0.9778484
00:48:35.844 --> 00:48:37.144 at this, so we'll see.
NOTE Confidence: 0.99592334
00:48:37.444 --> 00:48:38.404 But I do think that
NOTE Confidence: 0.99592334
00:48:38.404 --> 00:48:38.904 stress
NOTE Confidence: 0.96297294
00:48:39.364 --> 00:48:40.964 this particular stress might matter,
NOTE Confidence: 0.96297294
00:48:40.964 --> 00:48:42.265 but I think stress overall,
NOTE Confidence: 0.98812306
00:48:44.164 --> 00:48:45.844 irrespective, we see some similar
NOTE Confidence: 0.98812306
00:48:45.844 --> 00:48:47.605 biological changes on, like, you
NOTE Confidence: 0.98812306
00:48:47.605 --> 00:48:49.144 know, immune processes,
NOTE Confidence: 0.93152815
00:48:50.730 --> 00:48:51.690 a number of other,
NOTE Confidence: 0.9652136
00:48:52.250 --> 00:48:54.170 biological processes I haven't mentioned
NOTE Confidence: 0.9652136
00:48:54.170 --> 00:48:55.950 today. So there's some commonalities
NOTE Confidence: 0.9592538
00:48:56.650 --> 00:48:57.770 even if the types of
NOTE Confidence: 0.9592538
00:48:57.770 --> 00:48:59.850 stress stressors may differ. But
NOTE Confidence: 0.9592538

00:48:59.850 --> 00:49:01.050 it is an important question,
NOTE Confidence: 0.9592538

00:49:01.050 --> 00:49:02.350 so I do hope that
NOTE Confidence: 0.98139846

00:49:03.645 --> 00:49:05.005 people start looking into that,
NOTE Confidence: 0.98139846

00:49:05.005 --> 00:49:05.965 but I don't know. I
NOTE Confidence: 0.98139846

00:49:05.965 --> 00:49:06.925 might not go down that
NOTE Confidence: 0.98139846

00:49:06.925 --> 00:49:08.205 path. I'm already,
NOTE Confidence: 0.9874947

00:49:08.525 --> 00:49:09.505 stressed myself.
NOTE Confidence: 0.85469407

00:49:11.085 --> 00:49:12.145 I think so. Yeah.
NOTE Confidence: 0.89151764

00:49:12.445 --> 00:49:13.885 Thank you so much. Thank
NOTE Confidence: 0.89151764

00:49:13.885 --> 00:49:14.765 you. We have a question
NOTE Confidence: 0.89151764

00:49:14.765 --> 00:49:15.565 from Irem,
NOTE Confidence: 0.6163786

00:49:15.885 --> 00:49:16.385 Azamet.
NOTE Confidence: 0.98061943

00:49:16.925 --> 00:49:17.805 Irem, do you want to
NOTE Confidence: 0.98061943

00:49:17.805 --> 00:49:19.265 unmute and ask your question?
NOTE Confidence: 0.9327335

00:49:20.900 --> 00:49:22.259 First, can you hear my
NOTE Confidence: 0.9327335

00:49:22.259 --> 00:49:22.759 voice?

NOTE Confidence: 0.99962133
00:49:23.140 --> 00:49:23.640 Yes.
NOTE Confidence: 0.9834955
00:49:24.339 --> 00:49:25.539 So thank you so much,
NOTE Confidence: 0.9834955
00:49:25.539 --> 00:49:26.579 first of all, for this
NOTE Confidence: 0.9834955
00:49:26.579 --> 00:49:27.400 amazing presentation.
NOTE Confidence: 0.98961407
00:49:28.259 --> 00:49:29.619 I was just wondering that
NOTE Confidence: 0.98961407
00:49:29.619 --> 00:49:31.140 when we consider the,
NOTE Confidence: 0.91744983
00:49:31.859 --> 00:49:33.079 through all of the epigenetic
NOTE Confidence: 0.99649304
00:49:33.645 --> 00:49:33.965 changes,
NOTE Confidence: 0.90910774
00:49:34.445 --> 00:49:35.885 for the cannabinoid addictions.
NOTE Confidence: 0.98218817
00:49:36.525 --> 00:49:38.065 I was just wondering your
NOTE Confidence: 0.98218817
00:49:38.125 --> 00:49:39.725 thoughts about, like, how close
NOTE Confidence: 0.98218817
00:49:39.725 --> 00:49:40.785 are we for,
NOTE Confidence: 0.99952865
00:49:41.885 --> 00:49:43.505 personalized treatment approaches
NOTE Confidence: 0.9213635
00:49:44.125 --> 00:49:44.625 for
NOTE Confidence: 0.9771228
00:49:45.005 --> 00:49:46.225 those kind of patients,
NOTE Confidence: 0.97878534

00:49:46.765 --> 00:49:47.585 with the informed
NOTE Confidence: 0.76373893

00:49:47.885 --> 00:49:49.025 epigenetic profile?
NOTE Confidence: 0.9995137

00:49:49.619 --> 00:49:50.279 Thank you.
NOTE Confidence: 0.9967284

00:49:50.739 --> 00:49:52.980 Thanks. No. Great question. And
NOTE Confidence: 0.9967284

00:49:52.980 --> 00:49:54.359 the one thing I I
NOTE Confidence: 0.9575734

00:49:54.739 --> 00:49:56.819 perhaps should have emphasized, the
NOTE Confidence: 0.9575734

00:49:56.819 --> 00:49:58.579 aspect about epigenetics, I think,
NOTE Confidence: 0.9575734

00:49:58.579 --> 00:49:59.960 is really important for me.
NOTE Confidence: 0.9575734

00:50:00.180 --> 00:50:02.835 So we actually have characterized
NOTE Confidence: 0.9575734

00:50:02.835 --> 00:50:04.594 epigenetic changes, for example, in
NOTE Confidence: 0.9575734

00:50:04.594 --> 00:50:06.355 heroin users and other substance
NOTE Confidence: 0.9575734

00:50:06.355 --> 00:50:06.855 users.
NOTE Confidence: 0.99873286

00:50:07.155 --> 00:50:08.455 And we can
NOTE Confidence: 0.9938979

00:50:09.555 --> 00:50:11.015 reverse the heroin
NOTE Confidence: 0.93573505

00:50:11.635 --> 00:50:13.234 taking and heroin seeking behavior
NOTE Confidence: 0.93573505

00:50:13.234 --> 00:50:13.975 by targeting

NOTE Confidence: 0.9781978

00:50:14.700 --> 00:50:16.219 pharmacologically, not even just going

NOTE Confidence: 0.9781978

00:50:16.219 --> 00:50:17.280 into the brain, pharmacologically

NOTE Confidence: 0.9034424

00:50:17.580 --> 00:50:19.260 these epigenetic marks. But they're

NOTE Confidence: 0.9034424

00:50:19.260 --> 00:50:20.880 not yet ready for

NOTE Confidence: 0.99872524

00:50:21.820 --> 00:50:22.320 psychiatry

NOTE Confidence: 0.99840635

00:50:22.700 --> 00:50:23.200 populations.

NOTE Confidence: 0.88281476

00:50:23.500 --> 00:50:24.960 They're mainly using cancer.

NOTE Confidence: 0.9778531

00:50:25.339 --> 00:50:26.540 So, you know, we're still

NOTE Confidence: 0.9778531

00:50:26.540 --> 00:50:27.900 working and hoping in that

NOTE Confidence: 0.9778531

00:50:27.900 --> 00:50:29.234 way. But your question about

NOTE Confidence: 0.9778531

00:50:29.234 --> 00:50:31.234 the personalized profiling, I think,

NOTE Confidence: 0.9778531

00:50:31.234 --> 00:50:32.295 is really important.

NOTE Confidence: 0.99930155

00:50:32.914 --> 00:50:33.414 And

NOTE Confidence: 0.96419764

00:50:34.035 --> 00:50:36.114 epigenetic mechanisms, by their very

NOTE Confidence: 0.96419764

00:50:36.114 --> 00:50:36.614 nature,

NOTE Confidence: 0.99607825

00:50:37.714 --> 00:50:38.454 are reversible.
NOTE Confidence: 0.9407089

00:50:39.474 --> 00:50:40.674 And so to me, that's
NOTE Confidence: 0.9407089

00:50:40.914 --> 00:50:41.954 you know, it gives us
NOTE Confidence: 0.9407089

00:50:41.954 --> 00:50:42.535 the opportunity
NOTE Confidence: 0.9611059

00:50:43.080 --> 00:50:45.160 to indeed try to see,
NOTE Confidence: 0.9611059

00:50:45.160 --> 00:50:45.719 can we
NOTE Confidence: 0.9844661

00:50:46.680 --> 00:50:48.540 are there aspects of behavioral
NOTE Confidence: 0.9844661

00:50:48.760 --> 00:50:50.760 interventions? Are there aspects of,
NOTE Confidence: 0.9844661

00:50:50.760 --> 00:50:51.420 you know,
NOTE Confidence: 0.89456767

00:50:52.680 --> 00:50:54.920 again, perhaps certain pharmacological drugs,
NOTE Confidence: 0.89456767

00:50:54.920 --> 00:50:55.660 even certain
NOTE Confidence: 0.90884125

00:50:58.224 --> 00:50:59.844 medications are used in psychiatry
NOTE Confidence: 0.90884125

00:50:59.905 --> 00:51:01.685 impact on the epigenetic mechanisms.
NOTE Confidence: 0.90884125

00:51:01.905 --> 00:51:02.945 But if you know what
NOTE Confidence: 0.90884125

00:51:02.945 --> 00:51:04.244 might be changed
NOTE Confidence: 0.99604535

00:51:04.704 --> 00:51:06.145 in those individuals so one

NOTE Confidence: 0.99604535
00:51:06.145 --> 00:51:06.864 of the things that we're
NOTE Confidence: 0.99604535
00:51:06.864 --> 00:51:07.925 doing, we're also,
NOTE Confidence: 0.96050906
00:51:08.704 --> 00:51:10.645 piloting, looking at peripheral,
NOTE Confidence: 0.99862814
00:51:11.505 --> 00:51:12.645 epigenetic marks
NOTE Confidence: 0.99984515
00:51:13.000 --> 00:51:14.620 to see whether or not
NOTE Confidence: 0.9947306
00:51:15.080 --> 00:51:16.940 there are indeed these individual
NOTE Confidence: 0.9947306
00:51:17.080 --> 00:51:19.160 differences that might lend itself
NOTE Confidence: 0.9947306
00:51:19.160 --> 00:51:19.660 to
NOTE Confidence: 0.994479
00:51:20.040 --> 00:51:22.040 understanding who might benefit by
NOTE Confidence: 0.994479
00:51:22.040 --> 00:51:22.860 this particular,
NOTE Confidence: 0.96420866
00:51:23.400 --> 00:51:25.640 quote, unquote, epigenetic target versus
NOTE Confidence: 0.96420866
00:51:25.640 --> 00:51:27.944 another. So I completely agree
NOTE Confidence: 0.96420866
00:51:27.944 --> 00:51:28.984 with you, and let's see
NOTE Confidence: 0.96420866
00:51:28.984 --> 00:51:29.944 if, you know, we can
NOTE Confidence: 0.96420866
00:51:29.944 --> 00:51:31.545 get I never believed in
NOTE Confidence: 0.96420866

00:51:31.545 --> 00:51:33.144 the beginning that looking at
NOTE Confidence: 0.96420866

00:51:33.144 --> 00:51:35.305 peripheral biomarkers was gonna be
NOTE Confidence: 0.96420866

00:51:35.305 --> 00:51:37.704 helpful because epigenetic tags by
NOTE Confidence: 0.96420866

00:51:37.704 --> 00:51:38.984 their nature also are very
NOTE Confidence: 0.96420866

00:51:38.984 --> 00:51:39.724 cell specific.
NOTE Confidence: 0.97185755

00:51:40.260 --> 00:51:41.140 But I might have to
NOTE Confidence: 0.97185755

00:51:41.140 --> 00:51:42.260 eat my words. So I'll,
NOTE Confidence: 0.97185755

00:51:42.260 --> 00:51:43.060 you know, I'll let you
NOTE Confidence: 0.97185755

00:51:43.060 --> 00:51:44.500 know how the results go,
NOTE Confidence: 0.97185755

00:51:44.500 --> 00:51:45.700 but there are some interesting
NOTE Confidence: 0.97185755

00:51:45.700 --> 00:51:46.980 things there that I think
NOTE Confidence: 0.97185755

00:51:46.980 --> 00:51:48.920 your question is really critical.
NOTE Confidence: 0.9997063

00:51:50.980 --> 00:51:52.200 Thank you so much.
NOTE Confidence: 0.9774824

00:51:52.745 --> 00:51:53.864 We have a question for
NOTE Confidence: 0.9774824

00:51:53.864 --> 00:51:54.364 Marjorie.
NOTE Confidence: 0.9967082

00:51:55.225 --> 00:51:56.185 Marjorie, do you want to

NOTE Confidence: 0.9967082
00:51:56.185 --> 00:51:58.045 unmute and ask your question?
NOTE Confidence: 0.9884225
00:52:00.505 --> 00:52:01.785 Yes. Hi. Thank you so
NOTE Confidence: 0.9884225
00:52:01.785 --> 00:52:02.844 much for this presentation.
NOTE Confidence: 0.9849346
00:52:03.625 --> 00:52:05.225 You've certainly given us a
NOTE Confidence: 0.9849346
00:52:05.225 --> 00:52:06.585 lot to think about. It
NOTE Confidence: 0.9849346
00:52:06.585 --> 00:52:06.870 was,
NOTE Confidence: 0.99979323
00:52:07.430 --> 00:52:07.930 definitely
NOTE Confidence: 0.8211345
00:52:08.230 --> 00:52:10.170 a very dense, full packed
NOTE Confidence: 0.8211345
00:52:10.310 --> 00:52:11.050 with information.
NOTE Confidence: 0.988966
00:52:11.750 --> 00:52:13.030 I work more in the
NOTE Confidence: 0.988966
00:52:13.030 --> 00:52:13.930 OB arena,
NOTE Confidence: 0.9709615
00:52:14.550 --> 00:52:15.990 with women with substance use
NOTE Confidence: 0.9709615
00:52:15.990 --> 00:52:16.810 disorder. So,
NOTE Confidence: 0.9666731
00:52:17.350 --> 00:52:18.730 just caught my eye, obviously,
NOTE Confidence: 0.9666731
00:52:18.790 --> 00:52:20.090 going through from the placenta
NOTE Confidence: 0.9666731

00:52:20.310 --> 00:52:21.110 all the way through and
NOTE Confidence: 0.9666731

00:52:21.110 --> 00:52:22.650 all of these changes, and
NOTE Confidence: 0.79741263

00:52:23.105 --> 00:52:24.085 appreciate the,
NOTE Confidence: 0.88826066

00:52:24.704 --> 00:52:25.664 that you are doing this
NOTE Confidence: 0.88826066

00:52:25.664 --> 00:52:27.825 ongoing work now on using
NOTE Confidence: 0.88826066

00:52:27.825 --> 00:52:28.325 CBD.
NOTE Confidence: 0.9632666

00:52:29.424 --> 00:52:30.704 So I guess my question
NOTE Confidence: 0.9632666

00:52:30.704 --> 00:52:32.545 is because right now, we
NOTE Confidence: 0.9632666

00:52:32.545 --> 00:52:33.905 don't have a lot of
NOTE Confidence: 0.9632666

00:52:33.905 --> 00:52:34.405 concrete
NOTE Confidence: 0.974119

00:52:34.960 --> 00:52:36.560 evidence based information out there
NOTE Confidence: 0.974119

00:52:36.560 --> 00:52:38.500 on CBD use during pregnancy.
NOTE Confidence: 0.8899655

00:52:40.960 --> 00:52:41.920 How would you be able
NOTE Confidence: 0.8899655

00:52:41.920 --> 00:52:42.420 to
NOTE Confidence: 0.9976241

00:52:43.360 --> 00:52:43.860 recruit
NOTE Confidence: 0.93962884

00:52:44.320 --> 00:52:45.440 pregnant women, or will you

NOTE Confidence: 0.93962884

00:52:45.440 --> 00:52:47.360 be using pregnant animals? I

NOTE Confidence: 0.93962884

00:52:47.360 --> 00:52:49.219 mean, would this be amazing?

NOTE Confidence: 0.96512955

00:52:49.545 --> 00:52:50.744 And, also, I wanna say

NOTE Confidence: 0.96512955

00:52:50.744 --> 00:52:52.025 on the side note,

NOTE Confidence: 0.9730183

00:52:52.744 --> 00:52:53.864 it just kind of everything

NOTE Confidence: 0.9730183

00:52:53.864 --> 00:52:55.224 you said just reminds me

NOTE Confidence: 0.9730183

00:52:55.224 --> 00:52:56.125 of how important,

NOTE Confidence: 0.86353993

00:52:57.545 --> 00:52:58.444 treating stress

NOTE Confidence: 0.975615

00:52:59.065 --> 00:53:00.424 is in this population as

NOTE Confidence: 0.975615

00:53:00.424 --> 00:53:02.125 well. So whether that's counseling

NOTE Confidence: 0.975615

00:53:02.344 --> 00:53:03.305 or if they have a

NOTE Confidence: 0.975615

00:53:03.305 --> 00:53:05.005 diagnosis and they need medication.

NOTE Confidence: 0.987409

00:53:06.309 --> 00:53:08.170 Stress is the the pathological

NOTE Confidence: 0.9796495

00:53:08.550 --> 00:53:10.069 agent, and we all have

NOTE Confidence: 0.9796495

00:53:10.069 --> 00:53:11.589 to, I think, pay more

NOTE Confidence: 0.9796495

00:53:11.589 --> 00:53:13.510 attention to it. And it
NOTE Confidence: 0.9796495

00:53:13.510 --> 00:53:14.010 exacerbates
NOTE Confidence: 0.979916

00:53:14.390 --> 00:53:15.589 all the other things, but
NOTE Confidence: 0.979916

00:53:15.589 --> 00:53:17.290 stress is a key aspect.
NOTE Confidence: 0.7570108

00:53:17.875 --> 00:53:18.375 So,
NOTE Confidence: 0.92618203

00:53:18.995 --> 00:53:20.435 yeah, the question, you know,
NOTE Confidence: 0.92618203

00:53:20.435 --> 00:53:21.955 with CBD in pregnancy is
NOTE Confidence: 0.92618203

00:53:21.955 --> 00:53:23.315 very tough. A lot of
NOTE Confidence: 0.92618203

00:53:23.315 --> 00:53:23.815 pregnant
NOTE Confidence: 0.99790555

00:53:24.195 --> 00:53:25.475 women are being told, you
NOTE Confidence: 0.99790555

00:53:25.475 --> 00:53:25.975 know,
NOTE Confidence: 0.97607195

00:53:26.275 --> 00:53:27.875 one cannabis today, you know,
NOTE Confidence: 0.97607195

00:53:27.875 --> 00:53:29.075 can help them with their
NOTE Confidence: 0.97607195

00:53:29.075 --> 00:53:30.275 their nausea and all these
NOTE Confidence: 0.97607195

00:53:30.275 --> 00:53:32.030 things, but also CBD. And
NOTE Confidence: 0.97607195

00:53:32.030 --> 00:53:33.310 we really don't know enough

NOTE Confidence: 0.97607195
00:53:33.310 --> 00:53:34.050 about CBD
NOTE Confidence: 0.965719
00:53:34.590 --> 00:53:35.489 during pregnancy.
NOTE Confidence: 0.9875491
00:53:35.870 --> 00:53:37.070 And I think the problem
NOTE Confidence: 0.9875491
00:53:37.070 --> 00:53:37.969 also is,
NOTE Confidence: 0.9478662
00:53:39.710 --> 00:53:41.230 even if CBD we don't
NOTE Confidence: 0.9478662
00:53:41.230 --> 00:53:43.410 see actually has any real
NOTE Confidence: 0.9478662
00:53:43.630 --> 00:53:44.910 major side effects in our
NOTE Confidence: 0.9478662
00:53:44.910 --> 00:53:45.969 adult population,
NOTE Confidence: 0.8754115
00:53:47.205 --> 00:53:48.885 they're not pregnant because we
NOTE Confidence: 0.8754115
00:53:48.885 --> 00:53:49.385 exclude,
NOTE Confidence: 0.76961285
00:53:49.925 --> 00:53:51.145 with, pregnant,
NOTE Confidence: 0.9038416
00:53:51.605 --> 00:53:52.105 individuals.
NOTE Confidence: 0.9996263
00:53:53.285 --> 00:53:55.065 The problem I have is
NOTE Confidence: 0.9959825
00:53:55.685 --> 00:53:56.185 dose.
NOTE Confidence: 0.90854627
00:53:57.205 --> 00:53:58.725 So something like everything in
NOTE Confidence: 0.90854627

00:53:58.725 --> 00:54:00.425 biology, you know, we know
NOTE Confidence: 0.98995984

00:54:00.849 --> 00:54:02.210 that it can be great
NOTE Confidence: 0.98995984

00:54:02.210 --> 00:54:03.430 and beneficial beneficial,
NOTE Confidence: 0.97842413

00:54:03.810 --> 00:54:05.349 but then there's also this
NOTE Confidence: 0.97842413

00:54:05.410 --> 00:54:07.250 down then it starts having
NOTE Confidence: 0.97842413

00:54:07.250 --> 00:54:08.150 adverse events.
NOTE Confidence: 0.9813547

00:54:08.770 --> 00:54:10.130 So for me, I think
NOTE Confidence: 0.9813547

00:54:10.130 --> 00:54:10.630 that
NOTE Confidence: 0.9990971

00:54:11.010 --> 00:54:11.910 it's really
NOTE Confidence: 0.9851266

00:54:12.210 --> 00:54:13.489 difficult to tell a pregnant
NOTE Confidence: 0.9851266

00:54:13.489 --> 00:54:15.410 person that CBD actually looks
NOTE Confidence: 0.9851266

00:54:15.410 --> 00:54:17.085 relatively safe. But we really
NOTE Confidence: 0.9851266

00:54:17.085 --> 00:54:18.445 do not know that, as
NOTE Confidence: 0.9851266

00:54:18.445 --> 00:54:19.565 I said, for pregnancy, and
NOTE Confidence: 0.9851266

00:54:19.565 --> 00:54:20.445 we don't know if the
NOTE Confidence: 0.9851266

00:54:20.445 --> 00:54:22.065 dose range might differ for

NOTE Confidence: 0.99977976
00:54:22.525 --> 00:54:23.265 the mother
NOTE Confidence: 0.99290395
00:54:23.645 --> 00:54:24.765 and what it might differ
NOTE Confidence: 0.99290395
00:54:24.765 --> 00:54:25.744 for the fetus.
NOTE Confidence: 0.9966574
00:54:26.285 --> 00:54:27.105 And so
NOTE Confidence: 0.99350196
00:54:27.405 --> 00:54:28.940 I I think that a
NOTE Confidence: 0.99350196
00:54:28.940 --> 00:54:30.220 lot of research should be
NOTE Confidence: 0.99350196
00:54:30.220 --> 00:54:31.420 done. A lot of research
NOTE Confidence: 0.99350196
00:54:31.420 --> 00:54:32.480 should be done with CBD
NOTE Confidence: 0.99350196
00:54:32.540 --> 00:54:33.840 before we say it's
NOTE Confidence: 0.9778757
00:54:34.380 --> 00:54:36.140 okay or that it's not.
NOTE Confidence: 0.9778757
00:54:36.140 --> 00:54:37.680 I know there's some preclinical
NOTE Confidence: 0.9778757
00:54:37.900 --> 00:54:39.820 studies showing that it can
NOTE Confidence: 0.9778757
00:54:39.820 --> 00:54:41.360 actually reduce the,
NOTE Confidence: 0.9219101
00:54:42.344 --> 00:54:44.364 quote, unquote, schizophrenia like behavior
NOTE Confidence: 0.9219101
00:54:44.505 --> 00:54:46.045 seen later in the animals.
NOTE Confidence: 0.6871917

00:54:46.425 --> 00:54:46.825 I,
NOTE Confidence: 0.8630742

00:54:47.945 --> 00:54:49.565 and others that showed that
NOTE Confidence: 0.8630742

00:54:49.625 --> 00:54:51.725 it actually have worsened outcome
NOTE Confidence: 0.99559134

00:54:52.265 --> 00:54:53.405 on certain behaviors.
NOTE Confidence: 0.9733496

00:54:53.705 --> 00:54:55.545 Mhmm. So CBD is not
NOTE Confidence: 0.9733496

00:54:55.545 --> 00:54:56.905 something I think that we
NOTE Confidence: 0.9733496

00:54:56.905 --> 00:54:57.405 should
NOTE Confidence: 0.96537364

00:54:59.120 --> 00:55:00.660 encourage even in pregnant
NOTE Confidence: 0.9743808

00:55:01.040 --> 00:55:02.500 you know, for pregnant women,
NOTE Confidence: 0.97077477

00:55:03.440 --> 00:55:04.719 I think harm reduction is
NOTE Confidence: 0.97077477

00:55:04.719 --> 00:55:05.520 tough to say when we
NOTE Confidence: 0.97077477

00:55:05.520 --> 00:55:07.120 don't know what concentrate doses
NOTE Confidence: 0.97077477

00:55:07.120 --> 00:55:08.020 that they're using.
NOTE Confidence: 0.8665784

00:55:08.960 --> 00:55:10.180 Okay. Thank you.
NOTE Confidence: 0.9342782

00:55:11.325 --> 00:55:12.685 I think we have time
NOTE Confidence: 0.9342782

00:55:12.685 --> 00:55:14.445 for one last question. I

NOTE Confidence: 0.9342782
00:55:14.525 --> 00:55:16.125 and and, Nicola, would you,
NOTE Confidence: 0.9342782
00:55:16.445 --> 00:55:18.305 unmute and ask your question?
NOTE Confidence: 0.9230735
00:55:21.325 --> 00:55:22.445 Hi. You do you hear
NOTE Confidence: 0.9230735
00:55:22.445 --> 00:55:24.690 me? Yes. Hi. Hi. Thanks
NOTE Confidence: 0.9230735
00:55:24.690 --> 00:55:25.430 a lot
NOTE Confidence: 0.8908361
00:55:25.810 --> 00:55:27.330 for a very, very interesting
NOTE Confidence: 0.8908361
00:55:27.330 --> 00:55:28.930 talk. I was wondering if
NOTE Confidence: 0.8908361
00:55:28.930 --> 00:55:30.310 you have some, a candidate
NOTE Confidence: 0.8908361
00:55:30.530 --> 00:55:31.030 mechanism
NOTE Confidence: 0.9071569
00:55:31.890 --> 00:55:33.730 which you find, you found,
NOTE Confidence: 0.9071569
00:55:33.890 --> 00:55:34.390 affected,
NOTE Confidence: 0.82179755
00:55:35.650 --> 00:55:37.170 during the development of the
NOTE Confidence: 0.82179755
00:55:37.170 --> 00:55:38.369 the brain in a in
NOTE Confidence: 0.82179755
00:55:38.369 --> 00:55:39.375 a euro that's that's more
NOTE Confidence: 0.82179755
00:55:39.375 --> 00:55:39.875 than,
NOTE Confidence: 0.7864334

00:55:40.415 --> 00:55:41.935 like, differentiation of the neurons

NOTE Confidence: 0.7864334

00:55:41.935 --> 00:55:43.614 or path finding or or

NOTE Confidence: 0.7864334

00:55:43.614 --> 00:55:44.515 even maybe

NOTE Confidence: 0.84138244

00:55:44.975 --> 00:55:47.215 more, related to earlier events

NOTE Confidence: 0.84138244

00:55:47.215 --> 00:55:48.915 like neural stem cell differentiation,

NOTE Confidence: 0.84138244

00:55:49.135 --> 00:55:49.635 etcetera.

NOTE Confidence: 0.9528527

00:55:49.935 --> 00:55:51.475 And I also was wondering,

NOTE Confidence: 0.9528527

00:55:51.535 --> 00:55:52.735 what is the difference between

NOTE Confidence: 0.9528527

00:55:52.735 --> 00:55:54.335 the the mechanism where, you

NOTE Confidence: 0.9528527

00:55:54.335 --> 00:55:56.040 know, found affected in a

NOTE Confidence: 0.9528527

00:55:56.040 --> 00:55:57.239 in a or if you

NOTE Confidence: 0.9528527

00:55:57.239 --> 00:55:59.400 found any affected mechanism in

NOTE Confidence: 0.9528527

00:55:59.400 --> 00:56:00.460 the development

NOTE Confidence: 0.9960119

00:56:00.840 --> 00:56:01.820 during the development

NOTE Confidence: 0.90672797

00:56:02.280 --> 00:56:03.560 compared to the to the

NOTE Confidence: 0.90672797

00:56:03.560 --> 00:56:05.480 to the mechanism affected, during

NOTE Confidence: 0.90672797

00:56:05.480 --> 00:56:06.700 Adolescence administration?

NOTE Confidence: 0.99898946

00:56:10.594 --> 00:56:12.455 We haven't done the same,

NOTE Confidence: 0.99757075

00:56:12.835 --> 00:56:14.594 I think, degree of, like,

NOTE Confidence: 0.99757075

00:56:14.594 --> 00:56:15.094 morphological

NOTE Confidence: 0.99714947

00:56:15.474 --> 00:56:17.635 changes in the adults with

NOTE Confidence: 0.99714947

00:56:17.635 --> 00:56:19.075 prenatal as we did with

NOTE Confidence: 0.99714947

00:56:19.075 --> 00:56:20.455 the adolescent exposure.

NOTE Confidence: 0.95490676

00:56:22.140 --> 00:56:23.420 I mean, others have looked

NOTE Confidence: 0.95490676

00:56:23.420 --> 00:56:24.619 at it, and I've seen

NOTE Confidence: 0.95490676

00:56:24.619 --> 00:56:26.079 some similar similarities.

NOTE Confidence: 0.95269275

00:56:27.260 --> 00:56:28.460 I I don't know though

NOTE Confidence: 0.95269275

00:56:28.460 --> 00:56:29.739 that I've seen any data

NOTE Confidence: 0.95269275

00:56:29.739 --> 00:56:31.760 with the astrocyte related morphological

NOTE Confidence: 0.95269275

00:56:32.059 --> 00:56:32.559 changes

NOTE Confidence: 0.91114074

00:56:32.940 --> 00:56:33.680 with prenatal.

NOTE Confidence: 0.9325568

00:56:33.980 --> 00:56:35.200 So that may be
NOTE Confidence: 0.90830314

00:56:37.094 --> 00:56:38.775 be one thing there. But
NOTE Confidence: 0.90830314

00:56:38.775 --> 00:56:39.895 on the pre on the
NOTE Confidence: 0.90830314

00:56:39.895 --> 00:56:41.094 mechanistic side, one of the
NOTE Confidence: 0.90830314

00:56:41.094 --> 00:56:42.135 things that we saw, you
NOTE Confidence: 0.90830314

00:56:42.135 --> 00:56:43.335 know, early in number with
NOTE Confidence: 0.90830314

00:56:43.335 --> 00:56:44.234 t bone harkening,
NOTE Confidence: 0.9774978

00:56:44.775 --> 00:56:46.215 what we saw like, the
NOTE Confidence: 0.9774978

00:56:46.215 --> 00:56:47.575 past findings in terms of
NOTE Confidence: 0.9774978

00:56:47.575 --> 00:56:48.955 the pathways in,
NOTE Confidence: 0.98631847

00:56:49.655 --> 00:56:50.155 in
NOTE Confidence: 0.9306589

00:56:51.410 --> 00:56:53.010 adults with the with prenatal
NOTE Confidence: 0.9306589

00:56:53.010 --> 00:56:53.989 THC exposure,
NOTE Confidence: 0.91322976

00:56:54.370 --> 00:56:55.890 there was a significant difference
NOTE Confidence: 0.91322976

00:56:55.890 --> 00:56:57.190 that we and we could,
NOTE Confidence: 0.93096113

00:56:57.570 --> 00:56:59.010 link to even CB one

NOTE Confidence: 0.93096113
00:56:59.010 --> 00:56:59.510 receptor.
NOTE Confidence: 0.9791046
00:57:02.290 --> 00:57:03.250 I have to say there's
NOTE Confidence: 0.9791046
00:57:03.250 --> 00:57:04.450 so much that has changed
NOTE Confidence: 0.9791046
00:57:04.450 --> 00:57:05.694 in our work because of
NOTE Confidence: 0.9791046
00:57:05.694 --> 00:57:06.915 what's happened in society
NOTE Confidence: 0.9796002
00:57:07.295 --> 00:57:08.355 with the dosing.
NOTE Confidence: 0.9936663
00:57:08.655 --> 00:57:09.855 So the dose has made
NOTE Confidence: 0.9936663
00:57:09.855 --> 00:57:11.694 such a huge difference. And
NOTE Confidence: 0.9936663
00:57:11.694 --> 00:57:12.994 so now when we
NOTE Confidence: 0.99605596
00:57:13.454 --> 00:57:15.055 go back and we, you
NOTE Confidence: 0.99605596
00:57:15.055 --> 00:57:16.255 know, look at both our
NOTE Confidence: 0.99605596
00:57:16.255 --> 00:57:16.755 our
NOTE Confidence: 0.98519975
00:57:17.055 --> 00:57:18.810 our prenatal and our adolescent
NOTE Confidence: 0.98519975
00:57:18.810 --> 00:57:19.930 model, and that's why we
NOTE Confidence: 0.98519975
00:57:19.930 --> 00:57:22.030 actually, you know, are using
NOTE Confidence: 0.9405504

00:57:22.410 --> 00:57:23.450 a a model of self
NOTE Confidence: 0.9405504

00:57:23.450 --> 00:57:25.530 administration, for example, with edibles
NOTE Confidence: 0.9405504

00:57:25.530 --> 00:57:26.810 because that was easier to
NOTE Confidence: 0.9405504

00:57:26.810 --> 00:57:27.690 do, and we have our
NOTE Confidence: 0.9405504

00:57:27.690 --> 00:57:29.290 big vapor model trying to
NOTE Confidence: 0.9405504

00:57:29.290 --> 00:57:30.650 have a more translation to
NOTE Confidence: 0.9405504

00:57:30.650 --> 00:57:31.390 our human,
NOTE Confidence: 0.8723089

00:57:32.010 --> 00:57:32.510 work.
NOTE Confidence: 0.9957668

00:57:33.085 --> 00:57:34.945 You know, we see that
NOTE Confidence: 0.999269

00:57:35.805 --> 00:57:36.705 there are these
NOTE Confidence: 0.9934025

00:57:37.165 --> 00:57:38.925 very strong changes in relation
NOTE Confidence: 0.9934025

00:57:38.925 --> 00:57:40.605 to, for example, mitochondria, like
NOTE Confidence: 0.9934025

00:57:40.605 --> 00:57:41.085 I said,
NOTE Confidence: 0.810088

00:57:41.565 --> 00:57:42.305 and neuroinflammatory,
NOTE Confidence: 0.9995926

00:57:43.405 --> 00:57:43.905 processes
NOTE Confidence: 0.93520445

00:57:44.765 --> 00:57:45.265 that

NOTE Confidence: 0.9983595
00:57:46.990 --> 00:57:49.090 that CBD actually seems to
NOTE Confidence: 0.9983595
00:57:49.310 --> 00:57:50.210 even normalize.
NOTE Confidence: 0.9995851
00:57:50.670 --> 00:57:51.170 We
NOTE Confidence: 0.95516187
00:57:51.550 --> 00:57:53.490 we saw, like, the lipids
NOTE Confidence: 0.95516187
00:57:53.710 --> 00:57:54.210 are,
NOTE Confidence: 0.9359984
00:57:55.070 --> 00:57:55.890 not surprising,
NOTE Confidence: 0.8122265
00:57:56.590 --> 00:57:58.830 are are are changed really
NOTE Confidence: 0.8122265
00:57:58.830 --> 00:57:59.330 dramatically.
NOTE Confidence: 0.9397911
00:58:00.910 --> 00:58:01.410 And,
NOTE Confidence: 0.9886309
00:58:01.825 --> 00:58:03.105 again, that we can see
NOTE Confidence: 0.9886309
00:58:03.105 --> 00:58:05.025 that, you know, CBD can,
NOTE Confidence: 0.9886309
00:58:05.425 --> 00:58:06.785 impact on some of those
NOTE Confidence: 0.9886309
00:58:06.785 --> 00:58:07.665 from a at least from
NOTE Confidence: 0.9886309
00:58:07.665 --> 00:58:08.805 a treatment perspective.
NOTE Confidence: 0.9992187
00:58:09.425 --> 00:58:09.925 But
NOTE Confidence: 0.99929106

00:58:10.785 --> 00:58:11.925 a lot of the mechanisms
NOTE Confidence: 0.9345852

00:58:12.545 --> 00:58:14.065 I that we and and
NOTE Confidence: 0.9345852

00:58:14.065 --> 00:58:15.025 when I say we meaning
NOTE Confidence: 0.9345852

00:58:15.025 --> 00:58:16.290 the field had looked at
NOTE Confidence: 0.9345852

00:58:16.530 --> 00:58:17.810 earlier in terms of looking
NOTE Confidence: 0.9345852

00:58:17.810 --> 00:58:19.170 at the developmental effects of
NOTE Confidence: 0.9345852

00:58:19.170 --> 00:58:19.670 cannabis,
NOTE Confidence: 0.9679747

00:58:20.290 --> 00:58:21.250 I don't know if we're
NOTE Confidence: 0.9679747

00:58:21.250 --> 00:58:23.330 there with today. And this
NOTE Confidence: 0.9679747

00:58:23.330 --> 00:58:24.210 is what I think we
NOTE Confidence: 0.9679747

00:58:24.210 --> 00:58:25.510 need a lot more research,
NOTE Confidence: 0.9679747

00:58:25.730 --> 00:58:27.030 and I hope your center
NOTE Confidence: 0.9679747

00:58:27.250 --> 00:58:29.010 will, you know, will fund
NOTE Confidence: 0.9679747

00:58:29.010 --> 00:58:30.690 people within your groups that
NOTE Confidence: 0.9679747

00:58:30.690 --> 00:58:32.775 are really looking at dosing.
NOTE Confidence: 0.9679747

00:58:32.994 --> 00:58:34.035 That to me and and

NOTE Confidence: 0.9679747
00:58:34.035 --> 00:58:34.755 like I said, in the
NOTE Confidence: 0.9679747
00:58:34.755 --> 00:58:36.115 aspect of the interaction with
NOTE Confidence: 0.9679747
00:58:36.115 --> 00:58:38.055 stress, there's a greater pathological
NOTE Confidence: 0.99752563
00:58:38.355 --> 00:58:39.955 change with that combination of
NOTE Confidence: 0.99752563
00:58:39.955 --> 00:58:41.475 the high dose and the
NOTE Confidence: 0.99752563
00:58:41.475 --> 00:58:42.935 mechanisms that are occurring.
NOTE Confidence: 0.78492886
00:58:43.635 --> 00:58:45.075 But probably because of the
NOTE Confidence: 0.78492886
00:58:45.155 --> 00:58:46.855 you you in your experiment,
NOTE Confidence: 0.78492886
00:58:46.994 --> 00:58:47.640 you you,
NOTE Confidence: 0.7605995
00:58:48.640 --> 00:58:49.140 administer,
NOTE Confidence: 0.88109726
00:58:50.680 --> 00:58:52.920 cannabis by vape. Right? Not
NOTE Confidence: 0.88109726
00:58:52.920 --> 00:58:54.779 just few pure THC.
NOTE Confidence: 0.9890016
00:58:55.880 --> 00:58:57.640 Did I understand correctly? No.
NOTE Confidence: 0.9890016
00:58:57.640 --> 00:58:58.599 No. No. So for our
NOTE Confidence: 0.9890016
00:58:58.599 --> 00:59:00.625 animals, we still use vape
NOTE Confidence: 0.9890016

00:59:00.625 --> 00:59:01.365 of the cannabinoids.
NOTE Confidence: 0.91348773

00:59:01.745 --> 00:59:03.185 We use of THC and
NOTE Confidence: 0.91348773

00:59:03.185 --> 00:59:03.685 CBD.
NOTE Confidence: 0.9062257

00:59:03.985 --> 00:59:05.025 So we don't use the
NOTE Confidence: 0.9062257

00:59:05.025 --> 00:59:05.525 flower.
NOTE Confidence: 0.9543193

00:59:05.825 --> 00:59:06.945 And and I and there's
NOTE Confidence: 0.9543193

00:59:06.945 --> 00:59:08.065 there's there are groups that
NOTE Confidence: 0.9543193

00:59:08.065 --> 00:59:09.285 are looking at the flower,
NOTE Confidence: 0.908173

00:59:09.905 --> 00:59:11.265 and of vape in the
NOTE Confidence: 0.908173

00:59:11.265 --> 00:59:12.545 animal models, and so we'll
NOTE Confidence: 0.908173

00:59:12.545 --> 00:59:14.120 we'll see how those those
NOTE Confidence: 0.908173

00:59:14.120 --> 00:59:15.640 results also turn out. So
NOTE Confidence: 0.908173

00:59:15.800 --> 00:59:17.160 So why did you inject
NOTE Confidence: 0.908173

00:59:17.160 --> 00:59:17.660 HCC?
NOTE Confidence: 0.94363785

00:59:18.680 --> 00:59:19.720 And we've in we have
NOTE Confidence: 0.94363785

00:59:19.720 --> 00:59:21.400 injected also, and injection is

NOTE Confidence: 0.94363785
00:59:21.400 --> 00:59:22.440 more, you know, like, this
NOTE Confidence: 0.94363785
00:59:22.440 --> 00:59:23.260 very high
NOTE Confidence: 0.96162975
00:59:23.720 --> 00:59:25.480 high dose kind of of
NOTE Confidence: 0.96162975
00:59:25.480 --> 00:59:26.220 of model.
NOTE Confidence: 0.99755573
00:59:27.000 --> 00:59:28.280 The one thing for me
NOTE Confidence: 0.99755573
00:59:28.280 --> 00:59:29.340 that I feel
NOTE Confidence: 0.99545026
00:59:30.414 --> 00:59:31.934 comfortable in what our animal
NOTE Confidence: 0.99545026
00:59:32.174 --> 00:59:33.714 in in our models
NOTE Confidence: 0.99428785
00:59:34.255 --> 00:59:36.035 is because we actually replicate
NOTE Confidence: 0.99428785
00:59:36.095 --> 00:59:37.135 what we see in the
NOTE Confidence: 0.99428785
00:59:37.135 --> 00:59:37.635 human
NOTE Confidence: 0.8885814
00:59:38.174 --> 00:59:38.674 placenta.
NOTE Confidence: 0.8881269
00:59:39.055 --> 00:59:40.174 I see. In the human
NOTE Confidence: 0.8881269
00:59:40.494 --> 00:59:41.535 you know, so those to
NOTE Confidence: 0.8881269
00:59:41.535 --> 00:59:42.494 me are are
NOTE Confidence: 0.9674019

00:59:43.280 --> 00:59:44.560 that's why, at the end
NOTE Confidence: 0.9674019

00:59:44.560 --> 00:59:45.200 of the day, I do
NOTE Confidence: 0.9674019

00:59:45.200 --> 00:59:47.280 these translational studies. They're I'm
NOTE Confidence: 0.9674019

00:59:47.280 --> 00:59:48.160 not gonna like I said,
NOTE Confidence: 0.9674019

00:59:48.160 --> 00:59:49.119 I'm not gonna lie. They're
NOTE Confidence: 0.9674019

00:59:49.119 --> 00:59:49.859 they're painful.
NOTE Confidence: 0.97771674

00:59:50.480 --> 00:59:52.020 But at least you know
NOTE Confidence: 0.97771674

00:59:52.080 --> 00:59:52.580 that
NOTE Confidence: 0.999133

00:59:53.040 --> 00:59:53.700 the biological
NOTE Confidence: 0.9797155

00:59:54.000 --> 00:59:55.200 systems that at least your
NOTE Confidence: 0.9797155

00:59:55.200 --> 00:59:56.880 model is is impacting is
NOTE Confidence: 0.9797155

00:59:56.880 --> 00:59:58.020 what you see in humans.
NOTE Confidence: 0.9797155

00:59:58.275 --> 00:59:59.795 It's not ideal. There's nothing
NOTE Confidence: 0.9797155

00:59:59.795 --> 01:00:01.015 that's gonna replicate
NOTE Confidence: 0.9698958

01:00:01.474 --> 01:00:02.855 exactly the human condition,
NOTE Confidence: 0.9426226

01:00:03.395 --> 01:00:05.315 especially, you know, prenatal because

NOTE Confidence: 0.9426226
01:00:05.315 --> 01:00:06.375 even that, rodents
NOTE Confidence: 0.9855871
01:00:06.914 --> 01:00:07.954 are they're, you know, they
NOTE Confidence: 0.9855871
01:00:07.954 --> 01:00:09.714 don't their third trimester is,
NOTE Confidence: 0.9855871
01:00:09.714 --> 01:00:10.755 you know, out of the
NOTE Confidence: 0.9855871
01:00:10.755 --> 01:00:13.270 the the uterus. But the
NOTE Confidence: 0.9855871
01:00:13.270 --> 01:00:14.390 fact that we see some
NOTE Confidence: 0.9855871
01:00:14.390 --> 01:00:16.230 similar things and we actually
NOTE Confidence: 0.9855871
01:00:16.230 --> 01:00:17.130 study also
NOTE Confidence: 0.99397105
01:00:17.430 --> 01:00:19.610 the fetal brains of of,
NOTE Confidence: 0.9504993
01:00:20.310 --> 01:00:21.130 whose mothers
NOTE Confidence: 0.9901314
01:00:21.430 --> 01:00:22.950 in in people whose mothers
NOTE Confidence: 0.9901314
01:00:22.950 --> 01:00:23.450 had
NOTE Confidence: 0.92558014
01:00:23.910 --> 01:00:25.350 had used cannabis. And we
NOTE Confidence: 0.92558014
01:00:25.350 --> 01:00:26.490 we also replicate
NOTE Confidence: 0.9774284
01:00:27.345 --> 01:00:28.465 some of the the things
NOTE Confidence: 0.9774284

01:00:28.465 --> 01:00:29.585 that we see in our
NOTE Confidence: 0.9774284

01:00:29.585 --> 01:00:30.865 animal models, and that's what
NOTE Confidence: 0.9774284

01:00:30.865 --> 01:00:31.665 took us even to the
NOTE Confidence: 0.9774284

01:00:31.665 --> 01:00:33.365 amygdala. We saw these really
NOTE Confidence: 0.9774284

01:00:33.505 --> 01:00:35.665 dramatic changes in the the
NOTE Confidence: 0.9774284

01:00:35.665 --> 01:00:38.065 human fetal amygdala and mainly
NOTE Confidence: 0.9774284

01:00:38.065 --> 01:00:39.585 the males. And we thought
NOTE Confidence: 0.9774284

01:00:39.585 --> 01:00:40.545 that it was you know?
NOTE Confidence: 0.9774284

01:00:40.545 --> 01:00:41.365 And we thought
NOTE Confidence: 0.96123224

01:00:41.980 --> 01:00:43.100 early when people saw these
NOTE Confidence: 0.96123224

01:00:43.100 --> 01:00:44.620 sex differences was in adulthood
NOTE Confidence: 0.96123224

01:00:44.620 --> 01:00:45.660 and so on. But from
NOTE Confidence: 0.96123224

01:00:45.660 --> 01:00:47.200 early life, you see
NOTE Confidence: 0.9964708

01:00:47.740 --> 01:00:49.520 very significant sex differences.
NOTE Confidence: 0.9819812

01:00:49.900 --> 01:00:51.020 And so, like I said,
NOTE Confidence: 0.9819812

01:00:51.020 --> 01:00:52.540 because our animal models are

NOTE Confidence: 0.9819812
01:00:52.540 --> 01:00:53.980 not perfect, but because they
NOTE Confidence: 0.9819812
01:00:53.980 --> 01:00:55.260 replicate what we can look
NOTE Confidence: 0.9819812
01:00:55.260 --> 01:00:56.080 at in humans,
NOTE Confidence: 0.97181433
01:00:56.435 --> 01:00:58.295 I'm okay a little bit.
NOTE Confidence: 0.9912671
01:00:59.315 --> 01:01:00.055 Thank you.
NOTE Confidence: 0.934193
01:01:00.435 --> 01:01:01.075 Thanks. So,
NOTE Confidence: 0.99530584
01:01:02.195 --> 01:01:03.795 I have many questions for
NOTE Confidence: 0.99530584
01:01:03.795 --> 01:01:05.234 you, but I'm trying to
NOTE Confidence: 0.99530584
01:01:05.234 --> 01:01:06.855 be respectful of time.
NOTE Confidence: 0.8065307
01:01:08.035 --> 01:01:09.839 I'm good. Need And, I
NOTE Confidence: 0.8065307
01:01:09.839 --> 01:01:11.200 would encourage people,
NOTE Confidence: 0.95009637
01:01:11.599 --> 01:01:13.440 to submit any more questions
NOTE Confidence: 0.95009637
01:01:13.440 --> 01:01:15.039 that have been unanswered. We'd
NOTE Confidence: 0.95009637
01:01:15.039 --> 01:01:16.160 collect them and send them
NOTE Confidence: 0.95009637
01:01:16.160 --> 01:01:16.900 on to,
NOTE Confidence: 0.9705408

01:01:17.519 --> 01:01:18.880 to Yasmin if she has
NOTE Confidence: 0.9705408

01:01:18.880 --> 01:01:20.480 time to answer them. Wendy,
NOTE Confidence: 0.9705408

01:01:20.480 --> 01:01:21.700 you had a few announcements
NOTE Confidence: 0.9705408

01:01:21.759 --> 01:01:22.819 to make. Did you?
NOTE Confidence: 0.9466529

01:01:25.224 --> 01:01:26.984 Yes. Thank you, doctor Hurd.
NOTE Confidence: 0.9921687

01:01:28.665 --> 01:01:30.204 We have our next webinar
NOTE Confidence: 0.9921687

01:01:30.265 --> 01:01:32.045 scheduled for February the eighteenth
NOTE Confidence: 0.9921687

01:01:32.105 --> 01:01:33.244 with doctor Romina,
NOTE Confidence: 0.9741457

01:01:33.865 --> 01:01:35.724 Mizrahi, who will be presenting.
NOTE Confidence: 0.9898045

01:01:37.400 --> 01:01:38.460 If you are interested,
NOTE Confidence: 0.9867824

01:01:39.000 --> 01:01:41.160 an invitation will be sent
NOTE Confidence: 0.9867824

01:01:41.160 --> 01:01:41.660 out.
NOTE Confidence: 0.9969552

01:01:42.120 --> 01:01:43.900 We also have a survey,
NOTE Confidence: 0.95433116

01:01:44.680 --> 01:01:45.820 that will be listed,
NOTE Confidence: 0.99402964

01:01:46.680 --> 01:01:47.160 by,
NOTE Confidence: 0.7125275

01:01:47.560 --> 01:01:48.780 doctor, Ranganathan

NOTE Confidence: 0.95041347
01:01:49.080 --> 01:01:50.050 in regards to,
NOTE Confidence: 0.99325806
01:01:50.865 --> 01:01:53.445 getting more information regarding pediatrics
NOTE Confidence: 0.99325806
01:01:53.665 --> 01:01:54.485 and utilization
NOTE Confidence: 0.9432271
01:01:55.345 --> 01:01:57.285 of cannabis for pediatric professionals,
NOTE Confidence: 0.96992195
01:01:57.665 --> 01:01:59.185 if anybody is interested in
NOTE Confidence: 0.96992195
01:01:59.185 --> 01:02:00.965 partaking in that as well.
NOTE Confidence: 0.9638653
01:02:01.745 --> 01:02:03.425 This meeting, this webinar is
NOTE Confidence: 0.9638653
01:02:03.425 --> 01:02:04.785 being recorded. So if you
NOTE Confidence: 0.9638653
01:02:04.785 --> 01:02:06.000 would like to have access
NOTE Confidence: 0.9638653
01:02:06.000 --> 01:02:07.120 to it, you will get
NOTE Confidence: 0.9638653
01:02:07.120 --> 01:02:07.520 an automatic,
NOTE Confidence: 0.9120492
01:02:08.720 --> 01:02:09.220 invite,
NOTE Confidence: 0.9847123
01:02:09.600 --> 01:02:10.960 and it will be shareable
NOTE Confidence: 0.9847123
01:02:10.960 --> 01:02:12.320 with anybody else as you
NOTE Confidence: 0.9847123
01:02:12.320 --> 01:02:13.380 would like to share.
NOTE Confidence: 0.9657135

01:02:14.000 --> 01:02:15.940 So so, Yasmin, thank you
NOTE Confidence: 0.9657135

01:02:16.000 --> 01:02:17.360 very, very much. We couldn't
NOTE Confidence: 0.9657135

01:02:17.360 --> 01:02:18.240 have asked for a better
NOTE Confidence: 0.9657135

01:02:18.240 --> 01:02:19.780 way to kick off our
NOTE Confidence: 0.9657135

01:02:20.035 --> 01:02:21.955 webinar series. The next four
NOTE Confidence: 0.9657135

01:02:21.955 --> 01:02:24.595 are all focused on the
NOTE Confidence: 0.9657135

01:02:24.595 --> 01:02:26.275 effect of cannabis on brain
NOTE Confidence: 0.9657135

01:02:26.275 --> 01:02:27.875 development, different kinds of data
NOTE Confidence: 0.9657135

01:02:27.875 --> 01:02:29.095 that's gonna be presented.
NOTE Confidence: 0.9965543

01:02:29.395 --> 01:02:30.755 But thank you very much.
NOTE Confidence: 0.9965543

01:02:30.755 --> 01:02:31.075 We
NOTE Confidence: 0.97158605

01:02:31.555 --> 01:02:32.675 I I certainly learned a
NOTE Confidence: 0.97158605

01:02:32.675 --> 01:02:33.395 lot. I have a lot
NOTE Confidence: 0.97158605

01:02:33.395 --> 01:02:34.764 of questions for you, which
NOTE Confidence: 0.97158605

01:02:34.844 --> 01:02:36.224 I'll email you about.
NOTE Confidence: 0.91888875

01:02:36.604 --> 01:02:37.964 But thanks thanks again, and

NOTE Confidence: 0.91888875

01:02:37.964 --> 01:02:39.504 thanks everyone for attending.

NOTE Confidence: 0.99463

01:02:40.204 --> 01:02:40.944 Thank you.

NOTE Confidence: 0.9926438

01:02:41.324 --> 01:02:41.824 Bye.