WEBVTT

NOTE duration: ”00:03:19.253”

NOTE Confidence: 0.9707489

00:00:06.319 --> 00:00:07.620 We focus on the cerebellum,

NOTE Confidence: 0.9707489

00:00:07.759 --> 00:00:08.720 and it's this part of

NOTE Confidence: 0.9707489

00:00:08.720 --> 00:00:10.559 the brain that contains eighty

NOTE Confidence: 0.9707489

00:00:10.559 --> 00:00:11.679 percent of all the neurons

NOTE Confidence: 0.9707489

00:00:11.679 --> 00:00:12.880 in the brain, but it's

NOTE Confidence: 0.9707489

00:00:12.880 --> 00:00:13.905 small. It's in the back.

NOTE Confidence: 0.9707489

00:00:13.905 --> 00:00:15.105 It's actually Greek for small

NOTE Confidence: 0.9707489

00:00:15.105 --> 00:00:17.105 brain. And historically, it's been

NOTE Confidence: 0.9707489

00:00:17.105 --> 00:00:18.385 known to be responsible for

NOTE Confidence: 0.9707489

00:00:18.385 --> 00:00:19.125 motor coordination.

NOTE Confidence: 0.97603405

00:00:19.985 --> 00:00:21.185 But we know that the

NOTE Confidence: 0.97603405

00:00:21.185 --> 00:00:22.724 cerebellum is highly involved

NOTE Confidence: 0.9848074

00:00:23.185 --> 00:00:25.364 in social interaction, in cognitive

NOTE Confidence: 0.9947715

00:00:25.744 --> 00:00:26.244 function.

NOTE Confidence: 0.97534525

00:00:30.900 --> 00:00:32.420 We sit right at this

NOTE Confidence: 0.97534525

00:00:32.420 --> 00:00:34.580 overlap between motor impairment and

NOTE Confidence: 0.97534525

00:00:34.580 --> 00:00:36.180 cognitive impairment. Eighty percent of

NOTE Confidence: 0.97534525

00:00:36.180 --> 00:00:37.380 people with autism have some

NOTE Confidence: 0.97534525

00:00:37.380 --> 00:00:38.820 kind of motor impairment, and

NOTE Confidence: 0.97534525

00:00:38.820 --> 00:00:40.180 about fifty percent of patients

NOTE Confidence: 0.97534525

00:00:40.180 --> 00:00:41.540 with ADHD have some kind

NOTE Confidence: 0.97534525

00:00:41.540 --> 00:00:42.755 of motor impairment. So there's

NOTE Confidence: 0.97534525

00:00:42.755 --> 00:00:44.115 this Venn diagram, and we

NOTE Confidence: 0.97534525

00:00:44.115 --> 00:00:45.155 sit right in the middle

NOTE Confidence: 0.97534525

00:00:45.155 --> 00:00:46.435 to kind of understand how

NOTE Confidence: 0.97534525

00:00:46.435 --> 00:00:47.955 is the cerebellum involved in

NOTE Confidence: 0.97534525

00:00:47.955 --> 00:00:49.555 the motor impairment in these

NOTE Confidence: 0.97534525

00:00:49.555 --> 00:00:51.635 cognitive disorders, but also is

NOTE Confidence: 0.97534525

00:00:51.635 --> 00:00:53.335 it contributing to the cognitive

NOTE Confidence: 0.97534525

00:00:53.475 --> 00:00:55.395 aspects of these disorders as

NOTE Confidence: 0.97534525

00:00:55.395 --> 00:00:55.895 well.

NOTE Confidence: 0.98243606

00:01:01.060 --> 00:01:01.860 The bread and butter of

NOTE Confidence: 0.98243606

00:01:01.860 --> 00:01:02.840 our lab is electrophysiology.

NOTE Confidence: 0.9952489

00:01:03.380 --> 00:01:04.740 And so with that, we

NOTE Confidence: 0.9952489

00:01:04.740 --> 00:01:06.920 can actually record neuronal function.

NOTE Confidence: 0.9952489

00:01:06.980 --> 00:01:07.860 We have it on different

NOTE Confidence: 0.9952489

00:01:07.860 --> 00:01:09.080 levels. We can do electrophysiology

NOTE Confidence: 0.97411484

00:01:09.620 --> 00:01:10.900 in cell culture and say,

NOTE Confidence: 0.97411484

00:01:10.900 --> 00:01:12.244 okay. In a dish, what

NOTE Confidence: 0.97411484

00:01:12.244 --> 00:01:13.444 is this channel doing to

NOTE Confidence: 0.97411484

00:01:13.444 --> 00:01:14.564 this cell? We can do

NOTE Confidence: 0.97411484

00:01:14.564 --> 00:01:15.685 it in an intact brain

NOTE Confidence: 0.97411484

00:01:15.685 --> 00:01:17.064 and say, in a system,

NOTE Confidence: 0.97411484

00:01:17.284 --> 00:01:18.884 what is this mutation doing

NOTE Confidence: 0.97411484

00:01:18.884 --> 00:01:20.325 to this system, to the

NOTE Confidence: 0.97411484

00:01:20.325 --> 00:01:21.765 function of multiple cells, to

NOTE Confidence: 0.97411484

00:01:21.765 --> 00:01:22.564 the function of a cell

NOTE Confidence: 0.97411484

00:01:22.564 --> 00:01:23.444 in a brain? And so

NOTE Confidence: 0.97411484

00:01:23.444 --> 00:01:24.325 we're kind of going back

NOTE Confidence: 0.97411484

00:01:24.325 --> 00:01:25.685 and forth with that to

NOTE Confidence: 0.97411484

00:01:25.685 --> 00:01:26.185 compare.

NOTE Confidence: 0.9728402

00:01:28.220 --> 00:01:29.820 We have models of many

NOTE Confidence: 0.9728402

00:01:29.820 --> 00:01:30.800 of these mutations,

NOTE Confidence: 0.99773026

00:01:31.100 --> 00:01:32.220 and so what we can

NOTE Confidence: 0.99773026

00:01:32.220 --> 00:01:33.660 do with those models is

NOTE Confidence: 0.99773026

00:01:33.660 --> 00:01:35.280 we can record the neurons

NOTE Confidence: 0.99174744

00:01:35.740 --> 00:01:36.940 in those models. And so

NOTE Confidence: 0.99174744

00:01:36.940 --> 00:01:37.760 we use electrophysiology

NOTE Confidence: 0.9768316

00:01:38.860 --> 00:01:41.020 to record the function in

NOTE Confidence: 0.9768316

00:01:41.020 --> 00:01:42.555 health, but also record the

NOTE Confidence: 0.9768316

00:01:42.555 --> 00:01:43.755 function in a disease state

NOTE Confidence: 0.9768316

00:01:43.755 --> 00:01:45.115 and say, how do these

NOTE Confidence: 0.9768316

00:01:45.115 --> 00:01:47.055 mutations mess up this system?

NOTE Confidence: 0.9768316

00:01:47.275 --> 00:01:48.555 And then can we fix

NOTE Confidence: 0.9768316

00:01:48.555 --> 00:01:49.835 it by adding drugs? Can

NOTE Confidence: 0.9768316

00:01:49.835 --> 00:01:51.295 we fix it by manipulating

NOTE Confidence: 0.9768316

00:01:51.595 --> 00:01:53.675 this specific channel or channels

NOTE Confidence: 0.9768316

00:01:53.675 --> 00:01:55.215 that it interacts with?

NOTE Confidence: 0.9637787

00:01:57.040 --> 00:01:58.720 We also have a branch

NOTE Confidence: 0.9637787

00:01:58.720 --> 00:01:59.760 of my lab that is

NOTE Confidence: 0.9637787

00:01:59.760 --> 00:02:00.580 doing electrophysiology

NOTE Confidence: 0.9651902

00:02:01.360 --> 00:02:03.520 specifically in single cells. And

NOTE Confidence: 0.9651902

00:02:03.520 --> 00:02:04.560 so with that, we can

NOTE Confidence: 0.9651902

00:02:04.560 --> 00:02:05.840 add the DNA from these

NOTE Confidence: 0.9651902

00:02:05.840 --> 00:02:06.340 mutations,

NOTE Confidence: 0.95735556

00:02:06.640 --> 00:02:07.520 and we can say, how

NOTE Confidence: 0.95735556

00:02:07.520 --> 00:02:08.985 does it change the function

NOTE Confidence: 0.95735556

00:02:08.985 --> 00:02:10.444 of the channel? So increase,

NOTE Confidence: 0.95735556

00:02:10.504 --> 00:02:12.105 decrease in the channel function,

NOTE Confidence: 0.95735556

00:02:12.105 --> 00:02:13.065 and how is it changing

NOTE Confidence: 0.95735556

00:02:13.065 --> 00:02:14.444 the expression of a channel.

NOTE Confidence: 0.95735556

00:02:14.504 --> 00:02:15.544 And so we kind of

NOTE Confidence: 0.95735556

00:02:15.544 --> 00:02:16.905 have this holistic way of

NOTE Confidence: 0.95735556

00:02:16.905 --> 00:02:18.284 looking at these mutations

NOTE Confidence: 0.99830735

00:02:18.665 --> 00:02:20.205 in multiple different ways.

NOTE Confidence: 0.9856581

00:02:25.239 --> 00:02:26.519 Really, our goal is to

NOTE Confidence: 0.9856581

00:02:26.519 --> 00:02:27.959 help patients, and that's kind

NOTE Confidence: 0.9856581

00:02:27.959 --> 00:02:29.000 of my driving line. I

NOTE Confidence: 0.9856581

00:02:29.000 --> 00:02:30.060 interact with patients

NOTE Confidence: 0.9775366

00:02:30.360 --> 00:02:31.560 all the time. And so

NOTE Confidence: 0.9775366

00:02:31.560 --> 00:02:32.680 seeing them and seeing their

NOTE Confidence: 0.9775366

00:02:32.680 --> 00:02:33.879 passion, you just kinda wanna

NOTE Confidence: 0.9775366

00:02:33.879 --> 00:02:34.840 get back into the lab

NOTE Confidence: 0.9775366

00:02:34.840 --> 00:02:35.879 and say, okay. I'm gonna

NOTE Confidence: 0.9775366

00:02:35.879 --> 00:02:37.180 figure this out for you.

NOTE Confidence: 0.96364313

00:02:37.965 --> 00:02:39.405 Normally, with patients, they just

NOTE Confidence: 0.96364313

00:02:39.405 --> 00:02:41.005 kind of throw, drugs at

NOTE Confidence: 0.96364313

00:02:41.005 --> 00:02:42.285 them because they're treating symptoms.

NOTE Confidence: 0.96364313

00:02:42.285 --> 00:02:43.325 And so what we really

NOTE Confidence: 0.96364313

00:02:43.325 --> 00:02:44.285 wanna do is go down

NOTE Confidence: 0.96364313

00:02:44.285 --> 00:02:45.485 to the core. We're gonna

NOTE Confidence: 0.96364313

00:02:45.485 --> 00:02:47.025 go down to the mechanism

NOTE Confidence: 0.96364313

00:02:47.165 --> 00:02:48.845 behind these symptoms so we

NOTE Confidence: 0.96364313

00:02:48.845 --> 00:02:50.305 can actually treat the cause.

NOTE Confidence: 0.96364313

00:02:50.419 --> 00:02:51.540 And so what we're hoping

NOTE Confidence: 0.96364313

00:02:51.540 --> 00:02:53.060 is we can find a

NOTE Confidence: 0.96364313

00:02:53.060 --> 00:02:53.959 common mechanism

NOTE Confidence: 0.99043405

00:02:54.419 --> 00:02:56.419 that can alleviate the motor

NOTE Confidence: 0.99043405

00:02:56.419 --> 00:02:57.459 and alleviate some of the

NOTE Confidence: 0.99043405

00:02:57.459 --> 00:02:59.220 cognitive symptoms so these patients

NOTE Confidence: 0.99043405

00:02:59.220 --> 00:02:59.940 don't have to be on

NOTE Confidence: 0.99043405

00:02:59.940 --> 00:03:01.560 a laundry list of drugs.

NOTE Confidence: 0.9874584

00:03:02.180 --> 00:03:03.780 So we're really interested in

NOTE Confidence: 0.9874584

00:03:03.780 --> 00:03:05.625 understanding that, but also really

NOTE Confidence: 0.9874584

00:03:05.705 --> 00:03:07.705 interested in developing therapeutics based

NOTE Confidence: 0.9874584

00:03:07.705 --> 00:03:09.465 on the pharmacology and the

NOTE Confidence: 0.9874584

00:03:09.465 --> 00:03:10.985 recordings that we do to

NOTE Confidence: 0.9874584

00:03:10.985 --> 00:03:12.105 help fast track this to

NOTE Confidence: 0.9874584

00:03:12.105 --> 00:03:13.085 get it to patients.