

WEBVTT

NOTE duration: "00:03:52.789"

NOTE Confidence: 0.9671574

00:00:03.840 --> 00:00:05.279 If you think about the

NOTE Confidence: 0.9671574

00:00:05.279 --> 00:00:08.400 many external and internal stimuli

NOTE Confidence: 0.9671574

00:00:08.400 --> 00:00:09.599 that our brain kind of

NOTE Confidence: 0.9671574

00:00:09.599 --> 00:00:10.099 integrates,

NOTE Confidence: 0.991965

00:00:10.719 --> 00:00:12.099 it's very hard to imagine

NOTE Confidence: 0.991965

00:00:12.160 --> 00:00:12.660 that

NOTE Confidence: 0.9796257

00:00:13.585 --> 00:00:15.745 information about immune responses would

NOTE Confidence: 0.9796257

00:00:15.745 --> 00:00:16.645 not be included.

NOTE Confidence: 0.98554945

00:00:17.025 --> 00:00:18.064 And in fact, there are

NOTE Confidence: 0.98554945

00:00:18.064 --> 00:00:19.664 neurons that are distributed throughout

NOTE Confidence: 0.98554945

00:00:19.664 --> 00:00:21.265 our body that have the

NOTE Confidence: 0.98554945

00:00:21.265 --> 00:00:23.445 ability to detect immune mediators

NOTE Confidence: 0.98554945

00:00:23.505 --> 00:00:24.384 that are released by the

NOTE Confidence: 0.98554945

00:00:24.384 --> 00:00:25.904 immune system during an immune

NOTE Confidence: 0.98554945

00:00:25.904 --> 00:00:26.404 response.
NOTE Confidence: 0.95367527
00:00:32.720 --> 00:00:34.239 My lab works on how
NOTE Confidence: 0.95367527
00:00:34.239 --> 00:00:35.600 the brain and the immune
NOTE Confidence: 0.95367527
00:00:35.600 --> 00:00:36.739 system communicate.
NOTE Confidence: 0.9406714
00:00:37.440 --> 00:00:39.915 And for example, questions like,
NOTE Confidence: 0.9406714
00:00:39.915 --> 00:00:42.315 how does stress weaken our
NOTE Confidence: 0.9406714
00:00:42.315 --> 00:00:43.995 immune system? Which brain regions
NOTE Confidence: 0.9406714
00:00:43.995 --> 00:00:46.075 are involved? Which neurons? How
NOTE Confidence: 0.9406714
00:00:46.075 --> 00:00:47.455 are these neurons connected?
NOTE Confidence: 0.99749476
00:00:47.915 --> 00:00:49.035 How do they arise for
NOTE Confidence: 0.99749476
00:00:49.035 --> 00:00:49.755 the first time in the
NOTE Confidence: 0.99749476
00:00:49.755 --> 00:00:50.815 life of an individual?
NOTE Confidence: 0.9708522
00:00:51.195 --> 00:00:52.395 What happens when we grow
NOTE Confidence: 0.9708522
00:00:52.395 --> 00:00:53.640 older? And how do they
NOTE Confidence: 0.9708522
00:00:53.880 --> 00:00:54.620 drive behavior.
NOTE Confidence: 0.96065056
00:00:55.000 --> 00:00:56.200 So we're trying to understand

NOTE Confidence: 0.96065056
00:00:56.200 --> 00:00:57.160 how the brain and the
NOTE Confidence: 0.96065056
00:00:57.160 --> 00:00:58.520 immune system talk to each
NOTE Confidence: 0.96065056
00:00:58.520 --> 00:01:00.120 other, and how through this
NOTE Confidence: 0.96065056
00:01:00.120 --> 00:01:00.620 coordination,
NOTE Confidence: 0.99894655
00:01:01.239 --> 00:01:02.460 they drive
NOTE Confidence: 0.99427617
00:01:03.079 --> 00:01:03.579 physiological,
NOTE Confidence: 0.9813664
00:01:04.119 --> 00:01:04.619 immunological,
NOTE Confidence: 0.9909405
00:01:04.920 --> 00:01:05.580 and behavioral
NOTE Confidence: 0.9907567
00:01:05.959 --> 00:01:07.825 adaptation to the threats that
NOTE Confidence: 0.9907567
00:01:07.825 --> 00:01:08.965 are around us.
NOTE Confidence: 0.985412
00:01:14.305 --> 00:01:15.665 In the lab, we're particularly
NOTE Confidence: 0.985412
00:01:15.665 --> 00:01:17.425 interested in those neurons that
NOTE Confidence: 0.985412
00:01:17.425 --> 00:01:18.725 are located in the cerebral
NOTE Confidence: 0.985412
00:01:18.785 --> 00:01:19.285 cortex.
NOTE Confidence: 0.91369295
00:01:19.880 --> 00:01:21.160 There's the outer region of
NOTE Confidence: 0.91369295

00:01:21.160 --> 00:01:22.680 the brain, and it's involved
NOTE Confidence: 0.91369295

00:01:22.680 --> 00:01:25.080 in many cognitive functions, such
NOTE Confidence: 0.91369295

00:01:25.080 --> 00:01:27.180 as attention, decision making.
NOTE Confidence: 0.9818782

00:01:27.480 --> 00:01:28.520 And now we know that
NOTE Confidence: 0.9818782

00:01:28.520 --> 00:01:29.960 they also they are able
NOTE Confidence: 0.9818782

00:01:29.960 --> 00:01:30.460 to
NOTE Confidence: 0.9875884

00:01:30.920 --> 00:01:32.300 store and encode
NOTE Confidence: 0.9695908

00:01:32.680 --> 00:01:34.545 information about an ongoing immune
NOTE Confidence: 0.9695908

00:01:34.625 --> 00:01:35.985 response. They are connected in
NOTE Confidence: 0.9695908

00:01:35.985 --> 00:01:36.485 circuits.
NOTE Confidence: 0.9969816

00:01:37.584 --> 00:01:38.165 We use
NOTE Confidence: 0.97713673

00:01:38.545 --> 00:01:40.784 genetic tools to alter the
NOTE Confidence: 0.97713673

00:01:40.784 --> 00:01:42.485 DNA inside the cells.
NOTE Confidence: 0.9894205

00:01:43.185 --> 00:01:45.424 And then with microscopes and
NOTE Confidence: 0.9894205

00:01:45.424 --> 00:01:47.284 with some light and molecular
NOTE Confidence: 0.9894205

00:01:47.424 --> 00:01:49.345 tricks, we turn neurons on

NOTE Confidence: 0.9894205
00:01:49.345 --> 00:01:50.005 and off.
NOTE Confidence: 0.9474456
00:01:51.170 --> 00:01:52.210 And we have been able
NOTE Confidence: 0.9474456
00:01:52.210 --> 00:01:53.329 to see that if you
NOTE Confidence: 0.9474456
00:01:53.329 --> 00:01:55.490 turn neurons on, then you
NOTE Confidence: 0.9474456
00:01:55.490 --> 00:01:57.670 can cause allergy. So obviously,
NOTE Confidence: 0.9364514
00:01:58.049 --> 00:01:58.930 if you can turn them
NOTE Confidence: 0.9364514
00:01:58.930 --> 00:02:00.130 on and cause allergy, you
NOTE Confidence: 0.9364514
00:02:00.130 --> 00:02:01.490 can imagine that you could
NOTE Confidence: 0.9364514
00:02:01.490 --> 00:02:03.250 turn them off and reduce
NOTE Confidence: 0.9364514
00:02:03.250 --> 00:02:04.869 an allergy. So that's potentially
NOTE Confidence: 0.9364514
00:02:05.090 --> 00:02:05.829 very powerful.
NOTE Confidence: 0.991545
00:02:07.965 --> 00:02:09.165 We use an approach that
NOTE Confidence: 0.991545
00:02:09.165 --> 00:02:10.385 is both multidisciplinary
NOTE Confidence: 0.98989487
00:02:11.084 --> 00:02:11.905 and multilevel.
NOTE Confidence: 0.8439606
00:02:12.444 --> 00:02:12.944 Multilevel
NOTE Confidence: 0.97664917

00:02:13.405 --> 00:02:15.084 makes sense because we work
NOTE Confidence: 0.97664917

00:02:15.084 --> 00:02:16.625 at the interface between neuroscience
NOTE Confidence: 0.97664917

00:02:16.685 --> 00:02:18.044 and immunology, and so we
NOTE Confidence: 0.97664917

00:02:18.044 --> 00:02:20.785 merge approaches from both disciplines.
NOTE Confidence: 0.96848065

00:02:21.620 --> 00:02:22.739 And you can think about
NOTE Confidence: 0.96848065

00:02:22.739 --> 00:02:23.239 multilevel,
NOTE Confidence: 0.89243126

00:02:23.620 --> 00:02:24.660 like the level of the
NOTE Confidence: 0.89243126

00:02:24.660 --> 00:02:26.419 molecular level inside the cell.
NOTE Confidence: 0.89243126

00:02:26.419 --> 00:02:27.480 So genes,
NOTE Confidence: 0.9620431

00:02:28.180 --> 00:02:29.800 proteins, how do they interact,
NOTE Confidence: 0.9620431

00:02:30.020 --> 00:02:31.400 and how do they change
NOTE Confidence: 0.9620431

00:02:31.459 --> 00:02:32.980 cellular behavior? So the second
NOTE Confidence: 0.9620431

00:02:32.980 --> 00:02:33.940 level would be the level
NOTE Confidence: 0.9620431

00:02:33.940 --> 00:02:34.760 of a cell.
NOTE Confidence: 0.9586635

00:02:35.485 --> 00:02:36.845 And the third level, how
NOTE Confidence: 0.9586635

00:02:36.845 --> 00:02:37.825 cells interact

NOTE Confidence: 0.9956913
00:02:38.364 --> 00:02:39.264 as a population
NOTE Confidence: 0.96552277
00:02:39.644 --> 00:02:40.845 and talk to each other.
NOTE Confidence: 0.96552277
00:02:40.845 --> 00:02:42.544 And then how the activity
NOTE Confidence: 0.96552277
00:02:42.605 --> 00:02:43.825 of what we call neuronal
NOTE Confidence: 0.96552277
00:02:43.965 --> 00:02:44.465 circuits
NOTE Confidence: 0.9736744
00:02:44.925 --> 00:02:45.905 impacts behavior.
NOTE Confidence: 0.8668288
00:02:51.610 --> 00:02:52.349 This can
NOTE Confidence: 0.9687996
00:02:52.650 --> 00:02:54.889 lead to the identification of
NOTE Confidence: 0.9687996
00:02:54.889 --> 00:02:55.389 bidirectional
NOTE Confidence: 0.99322426
00:02:55.769 --> 00:02:56.830 therapeutic point.
NOTE Confidence: 0.92229664
00:02:58.090 --> 00:02:59.849 One side, being able to
NOTE Confidence: 0.92229664
00:02:59.849 --> 00:03:01.389 correct the impact of information
NOTE Confidence: 0.9973815
00:03:01.690 --> 00:03:03.435 on brain health and behavior.
NOTE Confidence: 0.9923066
00:03:03.974 --> 00:03:05.095 On the other side, we
NOTE Confidence: 0.9923066
00:03:05.095 --> 00:03:06.454 could imagine one day being
NOTE Confidence: 0.9923066

00:03:06.454 --> 00:03:07.435 able to tweak
NOTE Confidence: 0.99519145

00:03:07.894 --> 00:03:08.394 responses
NOTE Confidence: 0.9791177

00:03:08.935 --> 00:03:10.794 in the brain, neuronal responses,
NOTE Confidence: 0.97467023

00:03:11.655 --> 00:03:13.655 and that could impact, inflammation
NOTE Confidence: 0.97467023

00:03:13.655 --> 00:03:14.375 in the rest of the
NOTE Confidence: 0.97467023

00:03:14.375 --> 00:03:15.674 body. And that is relevant
NOTE Confidence: 0.97467023

00:03:15.814 --> 00:03:18.230 for chronic inflammation, even for
NOTE Confidence: 0.97467023

00:03:18.230 --> 00:03:18.730 cancer.
NOTE Confidence: 0.9861271

00:03:19.270 --> 00:03:20.630 And any of those levels
NOTE Confidence: 0.9861271

00:03:20.630 --> 00:03:21.830 that I mentioned earlier is
NOTE Confidence: 0.9861271

00:03:21.830 --> 00:03:23.430 a potential therapeutic target. So
NOTE Confidence: 0.9861271

00:03:23.430 --> 00:03:25.190 we could manipulate these neurons
NOTE Confidence: 0.9861271

00:03:25.190 --> 00:03:26.010 with pharmacology.
NOTE Confidence: 0.98379105

00:03:26.310 --> 00:03:27.910 We could even manipulate them
NOTE Confidence: 0.98379105

00:03:27.910 --> 00:03:29.850 in the future with noninvasive
NOTE Confidence: 0.99760413

00:03:30.230 --> 00:03:31.370 clinical tools.

NOTE Confidence: 0.9676308

00:03:32.145 --> 00:03:33.205 Doing interdisciplinary

NOTE Confidence: 0.99259734

00:03:33.584 --> 00:03:35.285 research is not easy.

NOTE Confidence: 0.97312003

00:03:35.665 --> 00:03:37.105 What's really unique about Yale

NOTE Confidence: 0.97312003

00:03:37.105 --> 00:03:38.305 is that we talk to

NOTE Confidence: 0.97312003

00:03:38.305 --> 00:03:39.584 each other. We are learning

NOTE Confidence: 0.97312003

00:03:39.584 --> 00:03:40.705 from each other. We work

NOTE Confidence: 0.97312003

00:03:40.705 --> 00:03:43.205 together. And, ultimately, that's how

NOTE Confidence: 0.97312003

00:03:43.265 --> 00:03:43.765 research

NOTE Confidence: 0.99963427

00:03:44.065 --> 00:03:45.525 leads to medical breakthroughs.