Welcome to the Huberman Lab Podcast,
where we discuss science and science-based tools
for everyday life.
I'm Andrew Huberman,
and I'm a professor of neurobiology and ophthalmology
at Stanford School of Medicine.
Today, my guest is Dr. Robin Carhart-Harris.
Dr. Carhart-Harris is a distinguished professor
of neurology and psychiatry
at the University of California, San Francisco.
He is one of the leading researchers
in the field of psychedelics
and how they change neural circuitry in the brain.
His laboratory is responsible for understanding,
for instance, how psilocybin,
also sometimes referred to as magic mushrooms,
change neural circuitry in the brain,
such that new ideas and new forms of learning occur.
His laboratory is also responsible
for carrying out various clinical trials,
some of which have demonstrated
that appropriate dosages of psilocybin
can alleviate major depression
in more than 67% of people that take the drug.
Now this is not to say that everybody should take psilocybin
and today's discussion describes both the clinical trials
and why treatments with psychedelics in some cases work
and in some cases do not work
in order to treat major depression,
as well as discussions around psilocybin,
lysergic acid diethylamide,
sometimes also referred to as LSD,
as well as DMT and how these change the brain
and how those brain changes can relate to changes
in mental health as it relates to depression
and other psychiatric challenges,
as well as how psychedelics are being applied
in order to change neural circuitry
for sake of expanding different aspects of the human mind,
including creativity, intelligence and much more.
During today's discussion, Dr. Carhart Harris
teaches us about the history of the study of psychedelics,
as well as how the legislature,

that is the laws surrounding psychedelics
are evolving in the United States and elsewhere
for the use of psychedelics to treat psychiatric challenges.
By the end of today's discussion,
you will have a thorough understanding
of how psychedelics work,
both in the short term during the actual journey or trip.
In fact, much of my discussion today
with Dr. Carhart Harris talks about the different aspects
of the psychedelic journey
and how those relate to therapeutic outcomes.
And of course, by the end of today's discussion,
you will also understand the long-term effects of psychedelics,
that is how they can actually rewire the brain.
Before we begin, I'd like to emphasize that this podcast
is separate from my teaching and research roles at Stanford.
It is, however, part of my desire and effort
to bring zero cost to consumer information
about science and science-related tools
to the general public.
In keeping with that theme,
I'd like to thank the sponsors of today's podcast.
Our first sponsor is AteSleep.
AteSleep makes smart mattress covers
with cooling, heating, and sleep tracking capacity.
I've talked many times before on this podcast
about the fact that sleep is the foundation
of mental health, physical health, and performance.
One absolutely critical variable
to getting excellent sleep
is the temperature of your sleeping environment.
That is, in order to fall and stay deeply asleep at night,
your body temperature needs to actually drop
by about one to three degrees.
And in order to wake up in the morning
feeling refreshed and alert,
your body temperature has to increase
by about one to three degrees.
There are a lot of ways to control the temperature
of your sleeping environment,
but one of the best ways it's to control
the temperature of your actual mattress,
the surface that you're sleeping on.

With AteSleep, you can do this very easily.
There's a simple to use app
where you can program in the temperature
of your mattress across the night.
So you can make it slightly cool at the beginning of the night,
getting cooler, putting you into deep sleep,
and then rapid eye movement sleep.
And all of that, in terms of its impact on your sleep
can be tracked within the same app.
I've been sleeping on an AteSleep mattress cover
for more than two years now,
and it has completely transformed my sleep.
If you'd like to try AteSleep,
you can go to atesleep.com slash Huberman
for their exclusive Memorial Day savings,
now through June 5th, 2023.
AteSleep currently ships in the USA, Canada,
United Kingdom, select countries in the EU, and Australia.
Again, that's atesleep.com slash Huberman.
Today's episode is also brought to us by Levels.
Levels is a program that lets you see
how different foods affect your health
by giving you real-time feedback on your diet
using continuous glucose monitor.
One of the most important factors
in terms of your energy levels
and your immediate and long-term health
are your blood glucose or blood sugar levels,
as they're commonly called.
With levels, you can assess how different foods
and activities impact your blood glucose levels.
When I did this, it taught me several things.
First of all, it taught me that certain foods
really spike my blood glucose levels,
and while spikes in blood glucose
aren't always a bad thing,
I was able to assess how certain foods
were spiking my blood glucose too much,
such that I would have post-eating dips in energy levels,
and by removing those foods
and substituting in other foods,
really evened out my energy levels.
So if you're interested in learning more about levels

and trying a continuous glucose monitor yourself,
go to levels.link slash Huberman.
Right now, Levels is offering
an additional two free months of membership.
Again, that's levels.link slash Huberman.
Today's episode is also brought to us by HVMN Ketone IQ.
Ketone IQ is a ketone supplement
that increases blood ketones,
and most people have heard of the so-called ketogenic diet,
but most people, including myself,
are not on the ketogenic diet.
That is, I and most people eat complex carbohydrates,
fruits, and things of that sort,
in addition to quality proteins, et cetera.
It turns out that even if you're not following
a ketogenic diet, increasing your blood ketones
can still have benefits.
So for instance, I use ketone IQ
anytime I want to do extended bouts of focused work,
preparing for podcasts, research, writing grants,
and if I ever want to exercise,
but I don't have time to eat
or I don't want to have my gut full of food,
taking ketone IQ and thereby increasing my blood ketones
allows me to do cognitive work or physical workouts
without getting hungry and with plenty of energy
and cognitive focus.
If you'd like to try ketone IQ,
you can go to hvmn.com slash Huberman to save 20% off.
Again, that's hvmn.com slash Huberman.
I'm pleased to announce that I will be hosting
two live events in September of 2023.
The first live event will take place in Toronto
on September 12th.
The second live event will take place in Chicago
on September 28th.
Both live events will include a lecture
and a question and answer period
and are entitled the Brain Body Contract,
during which I will discuss tools and science
related to mental health, physical health, and performance.
I should mention that a lot of that content
will have absolutely no overlap with content

covered previously on the Huberman Lab podcast
or elsewhere.
If you're interested in attending either
or both of these events,
please go to hubermanlab.com slash tour
and enter the code Huberman to get early access to tickets.
Once again, that's hubermanlab.com slash tour
and use the code Huberman to access tickets.
I hope to see you there.
And now for my discussion with Dr. Robin Carhart-Harris.
Dr. Carhart-Harris, welcome.
I've been wanting to talk to you for a long time.
I certainly have known who you are for quite a while
because I place you in this very small,
but very special and important category of researchers
who has been pioneering the use of psychedelics
for the treatment of specific clinical conditions
and really carrying the torch
for essentially the entire field.
So I wanna start with a voice of gratitude
and say thank you for doing this incredibly important work.
Could you tell us a little bit about what psychedelics are?
In fact, I'm curious as to how the name psychedelic
ever came to be
and what you think they potentially reveal
about the workings of the brain
and then we'll talk about the clinical applications.
Sure, well, even that one is kind of hot one
because opinions differ on how to define psychedelic
but perhaps a good starting place
is to start with the etymology,
where did the word come from?
And it was a Brit, excommunicated,
living in Canada, Humphrey Osmond,
who was due to present a paper
at a National Academy of Sciences meeting
on psychotometics, drugs that mimic aspects
of psychosis in their action.
And certain drugs like mescaline, let's see, 1956
and LSD were on the bill
and he felt dissatisfied with them
being under this category of psychotometics
and felt that the signature psychological effects

of these compounds went beyond
just mimicking psychotic symptoms.
And so he wanted to find a more apt term to speak to
in a sense the principal component of their action.
And he jotted down a few different possibilities
about a dozen or so, I think,
and one of them was psychedelic, actually,
it started as an ended up being psychedelic.
And he had a correspondence going on with another Brit,
also living in the US, Aldous Huxley,
where they were playing with some terms
to refer to these compounds.
And in the end, Osmond won with psychedelic
and he had this little ditty of to fathom hell
or sore angelic, just take a pinch of psychedelic.
That's where you put the disclaimer in.
And so what does that mean?
It's two ancient Greek words, psyche,
means the human mind, or if we're being
actually true to the ancient Greek, it means soul.
And then the other component means to make clear
or to make visible or to make manifest or to reveal.
So all of those work.
And it's a neologism, it's a made up word,
but it does have that ancient Greek origin.
And it's speaking to this principle
that these compounds reveal aspects of the psyche,
of the human mind, the soul,
that are ordinarily not entirely visible.
And so that's the etymology and it's wonderfully poetic,
but I happen to think it's also very accurate.
It's a useful term because it's sort of,
you might say, valence non-specific.
It doesn't say you're gonna have a great time
or that you're gonna go mad.
It's more that it reveals the psyche
and it could be hellish, but it could be heavenly.
And so that's the etymology and also a bit of the psychology
and sort of pointing to the phenomenology,
the subjective experience.
But there's also a pharmacology here.
And quite recently there was put out a consensus statement
about psychedelics that's really referring

to what we call the classic psychedelics
to say that these are all compounds
that work on a particular receptor in the brain,
the serotonin 2A receptor.
And that's another way that we could define these compounds.
I said this one's a little hot
because I'm of the view that while the pharmacology
is really useful, how the drugs work chemically,
you can't avoid the phenomenology.
And if we're true to the etymology,
where the term came from,
then we must recognize and we cannot neglect
the subject of experience.
Thank you for that beautiful description
of what brought us to today
in terms of using the word psychedelics
and now it's thrown around all the time.
Yeah, too much.
Yeah, too much.
And I'm guessing, well, not guessing,
I'm certain that it's also used to describe many compounds
that don't touch the 5H2, 5HT2A,
the serotonin 2A receptor.
So there is a broader categorization by most people
and it'll be interesting to see
where all the nomenclature and naming goes.
For the time being, I'd love for you
to tell us a bit more about this idea
that psychedelics, however one defines them,
can reveal something about the mind
that can't be revealed otherwise.
Are you talking about the subconscious?
I mean, psychologists and most famously Freud,
but also Jung and also neuroscientists,
I think about subconscious processing.
I think perhaps the most salient example for me
that's outside the realm of anything psychedelic
would be blind sight, this phenomenon
that you take people that are blind
but still have some connectivity in their brain
and you present them aboard with a computer screen
with different number of dots on each side
and you say, how many dots are on each side of the screen?

And they say, what do you mean?
I can't see the screen, I'm blind.
And you say, well, just guess.
And their guess rate is accurate
far more than chance would predict.
So they have so-called blind sight
and people have said, well,
this is the subconscious revealing itself.
There's no psychedelic drug involved,
but what you're describing is a pharmacologic induced
state that reveals something that normally,
should we assume is masked
or that we are oblivious to,
even though it's expressing itself,
but what does it mean for these drugs to be revealing
something about the workings of the mind
that would not be obvious to us otherwise?
Yeah, so the example of blind sight is interesting,
but it's different.
Blind sight would be referring to non-conscious processing,
maybe implicit processing.
So stuff going on in the mind,
in perception, in a sense,
that is below the threshold of conscious awareness,
but yet is influencing you.
So it's sort of, it's kind of related, but it's different.
So in depth psychology, psychoanalysis,
psychodynamic psychology,
you know, Sigmund Freud, Carl Jung, and so on,
we talk about the unconscious.
And there, it's more about the kind of blood and guts
of the human condition, the human nature,
both the personal unconscious,
so things that you might not want to necessarily
be conscious of because it's painful,
so that's the repression aspect,
pushing it out of conscious awareness.
Repressed memories in particular?
Yeah, like traumatic memories,
difficult relationships,
it could be complex trauma,
not necessarily just a specific index trauma,
but a series of trauma.

And then you have the collective unconscious,
which was really Carl Jung's contribution to say that,
there's a transpersonal quality to the unconscious.
There's aspects about humans,
not just this individual human,
as aspects to our minds,
our psyches that are not fully available
to conscious awareness,
but can come up in certain states, you know,
psychoanalysis went crazy for dreaming as their Royal Road
to a knowledge of the unconscious that was Freud.
But we now know with psychedelics,
and this was what drew me into the area,
was discovering literature
that was speaking to this particular action,
the psychedelic action,
and we're saying that when these drugs,
like LSD, psilocybin, found in magic mushrooms,
when they're used in psychotherapy,
material comes up that maybe may have been repressed,
that is of therapeutic value and awareness
and insight of this material
seems to catalyze the therapeutic process
with strong emotional release, these cathartic experiences
and insights, whether they're insights that are personal,
or whether they're transpersonal.
But for me, this is really where the meat of it is
with psychedelics and classic psychedelics in particular,
the likes of compounds like LSD and psilocybin.
I would say that if it wasn't for this action
by classic psychedelics,
we wouldn't be so interested in psychedelics.
I think if we only had compounds like ketamine, MDMA, cannabis,
that could be said broadly speaking to be psychedelic-like,
I don't think it necessarily would have captured
the world's attention as psychedelics are right now.
I actually think it's a major gap to fill
is this principle action of the classic psychedelics.
What does this mean that I'm referring to,
psyche revealing, what is that?
And I suppose where I'm going with this
is what is that in terms of the biology as well?
What's going on in the brain and the body

when people become aware of things
that previously they weren't fully aware of?
I'd like to talk about some of the clinical trials
that you've been involved with,
in particular looking at psilocybin, as you mentioned,
the principle hallucinatory psychedelic agent
in magic mushrooms.
I'd like to start with a kind of nuts and bolts question
just so that everyone's on the same page.
I've read the papers that you've published
and that others have published in this area
and typically the dosages used in these trials
are 25 milligrams of psilocybin.
We talk about one recent trial in particular
that compared 25 to 10 milligrams
to more frequent use of very small amounts,
one milligram over three weeks, for instance.
However, when people talk about magic mushrooms,
they often talk about gram doses of the mushroom
because I'm assuming that they contain
milligram dosages of psilocybin.
Here we're not encouraging use of any kind.
These are clinical trials,
but for clarity of understanding,
what is the conversion typically?
Like one gram of magic mushrooms
will contain how many milligrams of psilocybin on average?
Because what I'm trying to do here is calibrate people
to this idea of micro dosing versus macro dosing.
And that's fairly straightforward to do
with respect to the clinical trials,
but then in a lot of the lay discussion around this,
you hear about heroic doses versus micro doses.
And so I think there's a lot of confusion.
So if you would educate us on this idea
of what's a micro dose,
and perhaps also how many milligrams of psilocybin
are contained in a gram of quote unquote magic mushrooms.
Sure.
Well, a micro dose is neither of these are that simple,
but they're fun, it's a fun challenge.
But micro dose, one definition is that it's a dose
of typically a classic psychedelic like LSD or psilocybin

that has sub perceptible psychedelic effects.
Like it doesn't put you into a noticeable altered state
of consciousness that feels like you're tripping.
And if that was LSD, it looks as though the threshold
is around about, let's see, 10, 11, 12 micrograms.
Micrograms.
Micrograms.
I wanna be very clear here, micrograms.
So 10 micrograms of LSD, are you saying,
will not induce visual hallucinations in most people?
So that's threshold level.
That's about the level that some people
who are sensitive could feel it.
But if you were to talk to the micro dosing gurus,
they might say that that's kind of the ballpark
for an LSD dose that you would consider a micro dose.
And then you would take sort of semi-regularly.
It's typically something like one day on,
one day off, or one day on, two days off, this kind of thing.
There's different protocols.
And yeah, so some like Jim Faderman,
one of the popularizers of micro dosing,
I think would say that a true micro dose
should be sub perceptible.
You shouldn't feel it.
Yet the assumption is it's gonna change you in some way
on a kind of trait level, more than a state level,
and maybe behaviorally.
And the typical story goes, it will improve wellbeing.
And maybe, maybe it could improve certain aspects
of cognition, say related to creative thinking.
I emphasize the maybe there
because that's another angle with micro dosing.
We're kind of waiting for some compelling evidence.
As things stand right now,
I'd say we lack that compelling evidence.
There's some suggestive stuff,
but often the study designs aren't that strong.
It's really hard to do a study with micro dosing
because you need to have permission
to give people a micro dose that,
for practical reasons, they would go home with.
And otherwise, you're requiring them to be in the lab,

say three times a week for X number of weeks
to meet the criteria of a course of micro dosing,
which might be two or three times a week
for say a month.
And that's a hard thing to do in a lab study.
It's expensive.
You'd need to do that against a suitable control,
so a placebo control.
And there is a study that's been done in New Zealand
that has some interesting preliminary data
that did, I think, kind of did the design right,
but it hasn't been published yet.
I've seen some positive findings presented
around improvements in mood,
but it's a bit early to get too excited about that.
Needs to go through peer review and all that.
But as things stand, the evidence is pretty thin,
and we have to be honest about that.
We did quite a creative study with my colleagues
at Imperial, the guy leading that Balash Shigeti,
Hungarian chap, did a really creative design,
very much his brainchild, he instructed people
to do their own blinding,
their own placebo-controlled blinding
of their own microdosing.
So this was a classic citizen science study,
like do-it-yourself science,
where they would get their LSD tabs and chop them up,
put them into gel capsules, opaque,
and have other capsules that are the placebos
that they just close, empty capsule.
And then there was a whole barcode scan technique
so that you kind of shuffle them up,
but they've got the barcode in, the QR code,
so you can break the code later on,
but once you've shuffled them up,
you no longer know which ones have the microdosing
and which ones are empty.
Was this LSD?
This was LSD, he also tried it with mushrooms,
but the issues with the mushrooms was
people would burp sometimes, they'd belch,
and then they'd have this mushroom taste.

So then he instructed people to get
some non-psychoactive mushroom material to put in.
So it's really...
Not an easy study.
Not an easy study, and it was,
I love that kind of science,
real creative, first mover kind of science.
And the results were fascinating
because the short story is that the microdosing
didn't compellingly beat the placebo.
It did not.
It didn't.
He controlled, because he asked,
he controlled for expectancy.
So people with positive expectancy,
which is in a sense the vehicle
that carries the placebo response.
It's why you have a placebo,
is that positive expectancy can drive
a therapeutic effect to a large extent.
So he measured that pretrial
and then used it to kind of correct for the response.
And how did it work?
Those who got a placebo,
but thought they got a microdose,
did as well as those who thought they got a microdose
and did get a microdose.
So it was the bigger effect,
the majority of the effect was in thinking
that you got a microdose.
So in a sense, it was a victory
for the power of the placebo response.
And it's created all sorts of controversy.
People don't wanna believe it, you know, that kind of thing.
But that's the beauty of science, isn't it?
That science is not about what you want to believe.
That right there is the beauty of science, really.
I love that experiment, kudos to them.
I'm not going to attempt to say his last name correctly.
I tried, yeah, but you made a mess of it.
No, no, I think you got it.
You were involved in a clinical trial
that was published last year,

comparing 25 milligrams of psilocybin
to 10 milligrams of psilocybin.
It was a drug called Escatelopram.
Yeah, Lexapro, yeah.
And this one milligram over a three-week dosage.
In wanting to discuss the results of that study a bit
and some of the other trials
that you've done involving psilocybin
for depression, the treatment of depression,
could we calibrate ourselves?
25 milligrams of psilocybin is that what wouldn't,
it's going to be a perceptible dose, presumably,
hallucinations and all that.
And is that what one would find in, I'm guessing here,
if I'm accurate, this does not mean
that I have experience here,
but two grams of mushrooms.
It's more than that, we think, yeah.
Sorry, I missed that one, went off on a tangent.
But yeah, 25 milligrams of psilocybin would be,
we don't know, and it's important that I say that
because I wouldn't want people to hear my answer here
and then use it to calibrate their own dosing of mushrooms
and get it way off.
So it's guesswork, and I would love to see someone
do a proper study on it and look at the psilocybin content
in a given mass of psilocybin mushrooms, magic mushrooms.
But to my knowledge, that hasn't really been done.
Someone like Paul Stamets would give a better answer here,
but I think the percentage within the mushroom mass
is some of psilocybin in the mushroom mass
and psilocybin, which is a metabolite of psilocybin,
is something in the 1%, a little bit higher, maybe range.
Okay, so one gram, 1,000 milligrams of magic mushroom
would contain about 10 milligrams of psilocybin.
Broadly speaking, yeah.
Great, that helps calibrate, and I think, again,
just allows the layperson to understand a bit more
of where we're headed with these psilocybin trials
and the results.
So we don't have to restrict our discussion
to just that one clinical trial,
but if we include that one

and compare to some of the other trials that you've done,
I mean, your laboratory is seeing phenomenal,
in my opinion, phenomenal results in the treatment
of otherwise intractable depression, major depression,
which so many people suffer from,
from two, I suppose they're two sessions
of using psilocybin in these ranges of 10 to 25 milligrams.
Do I have that correct?
Okay, could we talk a little bit about what people
typically experience during those sessions
that allows this phenomenal transformation of mood
and state and trait as well?
And I'm especially interested in whether or not
it is the experience during those sessions
that is the trigger that's necessary
for the transformation from a depressed
to a non-depressed state.
Because the impulse is to think it is
that what one thinks and sees and hallucinates
is, and hears is so vital.
But of course, these drugs can create neuroplasticity
changes in our neural wiring,
presumably for long periods of time.
So what are your thoughts on the experience itself?
And maybe for those who have not done these compounds before,
you could explain a little bit about
what's typical for people.
And what you think is leading to that incredible
positive and pervasive change in mood, state, and trait.
I would say that it's more than impulse
that is leading us to think that the experience is important.
It's really data and converging evidence now.
So independent teams, independent studies
are converging on the magnitude
of certain kinds of experience,
rated, yes, with subjective rating scales
is predicting therapy to outcomes
pretty strongly and very reliably.
And so that's guiding us.
Now, could you say, well, maybe those experiences
are some kind of epiphenomenon
of say a central brain action?
Well, absolutely, but then all experience

is an epiphenomenon by that principle.
And yet we care about it, you know?
And it matters to us and in our human relations
with each other.
So I think it does matter to a human being
when they're in a say a psilocybin therapy session.
And as the drug effects begin to come on
and the body starts to feel a little strange and tingly.
And there's some initial anxiety
and then in their mind's eye,
they start to notice patterns and maybe colors
and then maybe those patterns deepen and they're dynamic
and they have this fascinating organic quality.
Are the patients in your studies
typically using an eye mask?
Or so they're in the eye mask, so eyes closed.
That's why you said mind's eye
as opposed to looking out into the clinical setting.
And that's one of the major differences
to psychedelic therapy versus taking a psychedelic
because you shut your eyes, you know?
And it's a world away from taking a psychedelic,
a rave or something, you know?
In a sense, good luck with that.
But in psychedelic therapy, yeah, it's settled conditions.
There's music playing and what I'm describing here
is very much the default.
There's actually very little variability
between the different sites that have done this work
on these conditions.
Typically, it's two people.
Ideally, mental health professionals at least one
who's a psychiatrist or a clinical psychologist
or some other kind of psychotherapist or psychiatric nurse.
But ideally, two who meet those criteria
with a individual who's ingested the drug
and music playing throughout a kind of runway
into taking the drug and then throughout.
So there's continuity.
Music with lyrics or without lyrics?
Without lyrics to begin with
and the music typically is spacious to begin with.
And then builds and becomes atmospheric.

There might be, I don't know,
some tribal drums in the distance
or something as it develops
or like the sound of a bird in the distance, you know?
A bird's call.
And then as it gets into more stronger drug effects,
the music starts to coax emotion
and very intentionally, you know, strings,
for example, would come in
and it would be an interesting experiment
and one that we'd love to do actually
to see whether if you were to pull that out,
whether the psychedelic experience would be
as emotionally intense as it is in psychedelic therapy
when you have music there as a default.
And across the board, people should find this remarkable
because it kind of is.
All of the published studies that are now, you know,
having such an impact on psychiatry and beyond
have music there as a staple component.
And we just take it as assumption that it needs to be.
I tend to share that assumption,
but it's remarkable that it hasn't been tested properly,
but it's there.
And, you know, if you were to run with that
and if you were, you know, had a kind of critical agenda,
you would say, well, this is music therapy, you know?
Why are you making all this fuss about psychedelics?
It's music that's there in all of these trials
with all these fantastic findings.
So there is something to that, you know?
And this will team me up probably
to talk about psychedelic therapy
being a combination treatment.
We have a hyphen between the two
because I share the hypothesis,
the assumption that should be tested better,
that there is a positive interaction between the two,
that there's a synergy between the two.
That's why it's psychedelic therapy for the hyphen.
Just like Cart-Heart-Harris.
I'd like to take a quick break
and acknowledge one of our sponsors, Athletic Greens.

Athletic Greens, now called AG1,
is a vitamin mineral probiotic drink
that covers all of your foundational nutritional needs.
I've been taking Athletic Greens since 2012,
so I'm delighted that they're sponsoring the podcast.
The reason I started taking Athletic Greens
and the reason I still take Athletic Greens
once or usually twice a day
is that it gets to be the probiotics
that I need for gut health.
Our gut is very important.
It's populated by gut microbiota
that communicate with the brain,
the immune system,
and basically all the biological systems of our body
to strongly impact our immediate and long-term health.
And those probiotics and Athletic Greens are optimal
and vital for microbiotic health.
In addition, Athletic Greens contains a number of adaptogens,
vitamins, and minerals that make sure
that all of my foundational nutritional needs are met.
And it tastes great.
If you'd like to try Athletic Greens,
you can go to athleticgreens.com slash huberman,
and they'll give you five free travel packs
that make it really easy to mix up Athletic Greens
while you're on the road and the car on the plane, et cetera.
And they'll give you a year supply of vitamin D3K2.
Again, that's athleticgreens.com slash huberman
to get the five free travel packs
and the year supply of vitamin D3K2.
This is extremely useful to hear
because I think most people think, okay, psychedelic,
whether or not they have experience with psychedelics
or not, it's a visual hallucination,
some auditory hallucination, some synesthesia,
some visual auditory blending, somatosensation,
rubbing a surface and being able to elicit the sounds
in one's mind, of course, et cetera.
But so seldom do we actually hear
about the specifics of these clinical trials
in a way that, for instance, points to music
as one of the perhaps key variables.

Now, you mentioned that as people enter these psychedelics
states that there's a little bit of initial anxiety
about a year and a half ago, I had a discussion
with Dr. Matthew Johnson, who's running
some psilocybin trials at Johns Hopkins, as you know.
And he mentioned the critical importance,
at least in his mind, to this idea of the patient,
quote unquote, letting go or allowing the experience
to take them someplace mentally,
as opposed to trying to constrain their sensory
and cognitive experience.
I'm curious what your reflections are on that idea
and why it might be so valuable clinically.
And this ties back to this earlier discussion
we were having about the unconscious
or about psychedelics revealing something
that's there all the time, but that we don't have access to.
And again, I'm struggling to find the right language
for this because we don't really have a neural mechanism
top-down inhibition or something like that
to explain how this unconscious might be uncorked
in the psychedelic experience.
But to make it quite simple and direct,
how important do you think it really is for the patient
to feel like they are, quote unquote, letting go
and what in the world is letting go in biological terms?
Yeah, yeah.
Well, I think we'll get there in terms of having
the neural correlates of the mind revealing itself
to itself, the emergence of the unconscious
into consciousness or unconscious material
into conscious awareness.
It's a wonderful challenge.
It's a huge challenge, but it's a challenge to embrace.
And letting go very much is, again,
a staple component of how the different teams
do this work in terms of encouraging a willingness
to let go.
And when we started out doing our depression work
and did that first trial,
it was the first trial of a psychedelic
in formerly diagnosed depression,
where that was the target population, a depressed population.

It was the first modern study to do that.
And we visited Hopkins, our friends there,
and were mentored on how to do the guiding,
Bill Richards, Mary Cosimano.
They were just so brilliant and wise in their guidance to us
as to how to do the guiding in our trial.
And so this phrase of trust, let go, be open,
you'll hear a lot.
I don't know who fairly it should be attributed to,
but I would attribute it to Bill, Bill Richards.
Yeah, everything's borrowed.
You've probably got it from someone else,
but it's such a key principle.
And it's almost like a mantra
that you're trying to instill in people trust,
let go, be open.
And those different components
where the trust is about therapeutic rapport,
that again, this goes beyond just intuition now.
We formally measured therapeutic rapport.
We do it even with just a single item,
a visual analog scale item,
the subjective rating scale item,
on the morning of dosing.
And we find that it's a significant predictor
of the quality of the experience
that you have under the drug in the psychedelic therapy.
And then the therapeutic outcomes
X weeks or months later.
So very powerful kind of chain
of sort of predictive components there,
but trust essentially important.
And again, not just intuition,
but the data pointing to that, let go.
There's a readiness to surrender,
to let go, to not resist.
And we do measure that too
and see that it's predictive of response.
And then the being open is about a willingness to go there,
to confront, to be inquisitive.
Something that's easier said than done,
can be terrifying, you know?
When you're dealing with a very vulnerable population,

it's probably more the rule than the exception
that they're carrying some significant adversity,
life adversity or frank trauma that they've suffered.
And so that message of be open,
be willing to confront and to go there is really,
you know, it's really powerful.
And that's how it plays out.
And often there is struggle.
There's something going on that is,
I don't want to be feeling this,
make it stop, that can be nightmarish at times,
but it's very, very strong.
And with these big doses that we give,
it's very strong.
And actually a student that I've worked with,
I think now doing a PhD,
Ari Brower is working on a fantastic project,
characterizing the different phases
of the psychedelic experience,
where the early phase is dominated by negative emotions
and negative evalanced feelings of anxiety and struggle.
And then it's a different story in the latter half.
Could I ask about that?
First of all, I think that's fascinating and important
to analyze the different phases.
And again, I'm delighted here
because people typically hear about a psychedelic journey,
but we never really hear about the kind of stereotypic
components of the beginning, middle and end of that journey.
We know that there's a peak
and that there's a kind of a parachuting down and et cetera.
But when you say that typically there's an anxiety,
maybe some negative valence in the early stage,
do you mean about the sensations people are experiencing
or about some prior event that's being called to mind
that they're remembering?
Likewise, for the positive phase of the psychedelic journey
or trip, are people, do they still call it a trip?
All right, for the, I guess, we'll use trip.
For the psychedelic trip,
are people feeling positive about the experience
like, ah, like there's been some sort of breakthrough
or they're in a calmer state

or is it that they tend to be focusing
on prior events that were positive?
So in other words, is there a threading through
of some concept that comes to mind for people,
maybe about an earlier trauma
or maybe about a sense of self
or a sense of other forgiveness?
Could be any of these things.
But what do we know about the kind of finer details
of all that?
I would say the initial struggle is more
against the general drug effects
than pinning it on something specific.
It's more that, in normal waking consciousness,
we have a sense, generally speaking,
if we're well or well enough,
a sense of assuredness about what's what
and there's a table here and so on.
And we have that assuredness to an extent
about ourselves as well.
It might be illusory, but we have it.
And what the drug's doing is it's breaking down all of that
and it's scary as hell, you know?
And if it's a big dose,
it's just like human nature to rage against that a bit
and a bit like dying, you know?
I don't want this.
It feels like I could be dying.
I might lose my mind.
Yeah, that too.
I'd never come back.
Those two are the classics is,
oh, but I might, you know,
I might know that I've taken a psychedelic
and I might even know a bit about psychedelics,
but I still fear that I'm gonna go mad
or that I know that, you know,
generally speaking, these drugs don't have a high,
you know, fertility risk.
I still think I'm gonna die, you know?
And it's just, it's very palpable and that comes up.
So yeah, that's, I mean, those are the core fears
that those two, and very reliably that comes up.

And it's really like a basic drug action.
It's dose dependent, but it's a basic drug action
that is forcing something about the nature of the mind
and the way it's made up that makes it feel that way.
Oh, but it feels like I'm losing my mind
or it feels like I could lose my mind
or that I could go insane
or that maybe I'm dying here and this is bad.
Yeah.
You've talked many times before
and have done really wonderful work,
looking at the changes in communication
between different brain areas
while people are under the influence of psychedelics.
And I think the gestalt of those data, correct me
if I'm wrong is that compared to the non-psychedelic state
that under psychedelic influence,
there is far more, let's just call it inter-conactivity
or communication between a brain areas
that typically aren't communicating,
which probably is not surprising to people
given the subjective effects of these drugs.
What is the evidence that after the psychedelic journey
is over that some or perhaps all of that enhanced
communication across brain areas is maintained?
And if so, what role do you feel that could play
in these incredible positive therapeutic outcomes?
Yeah.
So we've had some recent findings in that direction
where yes, it's true.
And the picture that says a thousand words
that some people might be familiar with
are these two circles,
a project that we did in collaboration
with some researchers where ordinarily
the communication is going on within systems.
Like other regions of the visual system
will be speaking mostly within the visual system.
There'll be a kind of clickishness or a modularity
to the quality of the communication in the brain.
And then the cool finding with psilocybin
was the first paper is the communication.
Yes, it sort of transcends these modules

and becomes much more inter-modular
crossing different modalities.
And that effect correlated with the magnitude
of the subjective effects.
And then we replicated it with LSD
using different methods.
And a new paper will come out soon
with DMT showing a similar effect.
It's a bit of a debate about what regions
are most implicated, but the general effect
of an increase in global functional connectivity
is what we call it or global communication in the brain.
And this is while under the influence of these drugs.
This is under the influence.
So putting people into a brain scanner
while they are under the influence of the drug.
Is that right?
Yes.
That would be quite an experience
given that these scanners are small tubes.
You're in a bite bar.
You've got a bite bar in your mouth.
That's quite a study.
You don't always have a bite bar,
at least with the psychedelics.
But yeah, you've got to keep your head still.
And you have the loud MR scanner noise going.
But because it's regular, there aren't too many surprises.
So it's actually surprisingly tolerable.
And you're in a hospital setting.
So you're not worried about what would happen
if you had a cardiac event or something.
You've got professionals around.
And most people generally tolerate
that setting quite well, surprisingly well.
But yeah, we do all that.
And yes, we do see that opening up of the communication
across systems in the brain.
And it does speak to kind of intuition
about the subjective experience
that different modalities might be blending with each other.
Sorry for interrupting, but I have to ask,
is it thought that the activation of the serotonin 2A receptor

is what's responsible for the increased communication
between brain areas that under normal circumstances
would not be communicating?
Yes.
So there's a few reasons why some modeling work,
the computational modeling work,
that first identifies where the 2A receptor is
and then looks at, models its basic effects
on neural activity will recapitulate the,
or recreate the effect that we see actually
in the data with the scanning.
So doing the computational modeling,
you can see the same effect by knowing
where the key receptors are
and then making them do a certain thing
that we know psychedelics do.
I can imagine two possibilities.
And I think it's important to distinguish
between these two.
One possibility is that the activation
of this serotonin 2A receptor leads to increased connectivity
and thereby auditory and visual hallucinations emerge,
changed patterns of thinking emerge, et cetera.
That's sort of the obvious interpretation,
but the scientist in me has to ask,
is it possible that all of that increased connectivity
is occurring and yet that is a distinct phenomenon
layered on top of some other effect of the psychedelic drugs
impacting access to the unconscious, hallucinations.
In other words, is it the increased connectivity
that's leading to the subjective experience
or are those two things happening in parallel?
Well, they happen in parallel and they map to each other.
But the question of causality, what causes what
is the tricky thing where I would suggest that the,
the causality is circular, that they influence each other.
And this gets a bit philosophical,
but it kind of matters because otherwise, you know,
there's a trap that it's easy to fall into
where you're thinking that it's all about the brain action
causing the subjective experience.
And that's typically what we do in cognitive neuroscience.
It's kind of like the sort of first port of call,

kind of materialist approach,
but one can be a materialist essentially,
but still appreciate that circular causality
that mind also interacts with brain.
And it's so hard to pick the two apart
and there is a kind of essential dualism
where subjective experience is the thing in and of itself,
but that's not to divorce it from what's going on
on the biological level.
The reason I ask is because as I understand it,
nowadays there's a bit of a movement
within the scientific community that studies psychedelics
to develop drugs that can essentially cure
or alleviate many of the symptoms of depression or trauma
that are built off our understanding
of how psychedelics like psilocybin,
and here I'll throw MDMA in there,
although classically not a psychedelic,
it kind of gets lumped in, we can get back to that later,
but that do not produce hallucinations
or massive changes in subjective experience.
Actually, I think this is what initially got us
into conversation on Twitter as I had learned
about this paper published out of a group at UC Davis
that essentially modifying psychedelics
so that they have potential therapeutic application
for the treatment of depression,
but zero hallucinogenic properties.
And I thought, wow, this is going to be
a very controversial thing in the world, right?
Because the history of psychedelics, as you pointed out,
has been one of people accessing different modes
of thinking, feeling, seeing things,
these letting go, trust, et cetera,
a therapeutic relationship.
And here we have, I don't want to say pharma
because it's not really pharma,
but we have laboratories who are trying to tease apart
the activation of receptors independent
of all that subjective experience
in order to essentially treat the same conditions.
I'd love for you to comment on this,
where you think it might be going and whether or not

you think that's the right or the wrong approach
if it has any validity at all.
It is pharma, it's just smaller pharma,
sort of startup pharma.
Okay, so because pharma would like to have drugs
that can cure depression but don't make people hallucinate,
is that correct?
Oh, they would and patients might
and the system would love it
because the system is used to it, it's medicine.
And it doesn't give this mental imagery
of the summer of love in San Francisco
or of kaleidoscope eyes, right?
It's more, you could imagine the more,
to be careful with my wording here,
those who would not be inclined toward that
would might embrace a therapeutic
that is strictly effective at treating depression
with no hallucinations.
Yeah, and it doesn't look like an individual
lying on a sofa, crying their eyes out
about the life that they've lived
and that deep catharsis being life transforming.
It's very different from that model.
I'm skeptical of it for a few reasons.
And one is that I can't see the logic.
I can't see the pieces fit in a way that's compelling.
And I'm also skeptical because I think
it could easily be wishful thinking
because of that point that patients would like it
and the system would like it.
And I just, you gotta bear that in mind as well.
So wouldn't it be convenient if it were true
and you could get the therapeutic action
without the psychedelic effects?
Well, in a way, that's a little bit of what micro dosing
seems to be designed to do.
Like you said, take dosages there below that perceptual
or some awareness of some effect threshold
over a longer period of time in an attempt
to ping the circuits or alter the circuits
but not hallucinate, not have a catharsis.
So if micro dosing can do that and it's sub perceptible,

then micro dosing isn't psychedelic action
because where's the psychedelic action?
When psychedelic, when defined means psyche revealing,
you're not getting that effect.
You might be getting the pharmacology,
you might be getting some direct serotonin
to a receptor agonism that could be driving
a therapeutic response, but you can get that
with SSRIs as well.
And so my point is, what's new?
Okay, maybe it's a bit new
and people are now developing direct two-way agonists
rather than indirect through a serotonin releaser
like the selective serotonin reuptake inhibitors,
the SSRIs like Lexa Pro, you know.
Are there any SSRIs that selectively agonize,
which folks by the way means activate in a good way?
Agony sounds terrible to those that are non-formed
might think that, I mean the disrupt,
but that can activate the serotonin to a receptor?
Are there any drugs that will do that
that are not psychedelic?
I'm not aware of any, but then again,
I'm not a psychopharmacologist.
There are, I mean, are there any that are licensed
and used as medicines in psychiatry?
I actually had this debate recently on social media
and I couldn't see a compelling example.
I saw two-way agonists that were used for other things.
You have a compound like Lyseride,
used in treating Parkinson's,
but actually it's more of a dopamine agonist.
Right, so they're always hitting other things, right?
Yeah, yeah.
They're always tapping other neurotransmitters.
All they've been used for other things.
So is there a selective serotonin to a receptor stimulator,
an agonist, that it isn't psychedelic,
that it's therapeutic in psychiatry
and the answer firmly is no, I haven't seen it yet.
Will they develop one?
Well, for patients' sake, I hope so,
because it would be great.

Let's wait and see.
If they do, I doubt it will be psychedelic
and I doubt it would have much to do with psychedelic therapy
and it would be much more like the system we're used to
of chronic pharmacotherapy.
Take your drug every day.
Let's hope they find it and it works for patients' sake,
but as things stand right now, I'm a little skeptical.
Now, some of the findings that are being seen
that are really exciting, fantastic work being done,
showing things like increases
in the communication components of neurons,
dendritic growth, spine growth, synaptic spine growth.
Yeah, by the way, folks, just I'll interrupt
for not necessarily spine, not the cerebral column,
but spines are these little tiny twigs with bulbs
on the end of neurons that allow
for communication points between neurons.
So neuroplasticity is often associated
with growths of dendrites and spines and so forth,
which is what Robin's referring to.
That reminds me and I just wanna make sure
that we close the hatch on the earlier answer
because I interrupted you.
Is the increased connectivity between or communication
between brain areas that's observed
while people are under the influence of the psychedelic
also observed later after the effects of the drug wear off.
And then I'll just throw in another question there
because we're onto this topic now.
To what extent do we think that neuroplasticity,
structural changes in neurons,
functional changes in neurons are responsible for that?
And how long does that last?
Let's say I come into your clinic,
subject in your experiment,
I come in in the morning, I do my psychedelic journey
five to six hours later, parachuting back to reality,
as we call it, and then I go home,
increased connectivity lasts for how long
and how long are the structural brain changes occurring?
Well, you're asking fantastic questions
and partly because we don't have the answer yet,

but we do have some data.
And so we have looked at, first of all,
in a sense the functional plasticity
or what we assume it to be,
or at least the functional changes,
the increase in communication across systems,
that increase in global connectivity,
functional connectivity.
Do we see it after the trip?
We know we see it during the trip,
pretty well replicated, correlating with intense drug effects.
Do we see it after the trip?
Well, the answer is we've seen it
in two different depression cohorts,
psilocybin therapy for depression.
In one study where we look the next day,
we saw it, a kind of residual effect,
similar to what you see acutely
being seen the next day.
And then in a subsequent study,
we saw it also three weeks later.
So we've seen it in two independent data sets,
this decrease in modularity is how we measure it.
It's the same thing, essentially,
broadly speaking, it's the same thing,
an increase in global connectivity,
functional connectivity.
And actually unpublished,
we've seen it in healthy volunteers
on a correlational level,
not on an absolute change level,
but if you look at its relationship
to a mental health outcome,
and this is an important thing to stress
with the depression work,
we saw a relationship between the magnitude of that change,
the decrease in modularity,
or increase in global connectivity,
and the improvement in symptom severity.
So interesting.
Yeah.
And just to state it a different way,
so what Robin's referring to is when you say modularity,

as neuroscientists, we think of the different modular networks
of the brain that the eye talks to a region
of the thalamus involved in vision,
which talks to the visual cortex,
which eventually converges with auditory information, of course,
but there's a separation or modularity of function.
This increased connectivity is cross-modular
in during the trip, but afterwards as well,
and you're saying that that correlates very strongly
with the strength of the therapeutic outcome for depression.
I mean, the logical extension of that
is that extreme modularity of brain function
is depressive in some way.
Now, we don't want to go too far,
but what does that mean,
that increasing crosstalk between different modules
of the brain is so strongly correlated
with a positive therapeutic outcome?
We don't know, other than as a relationship.
I mean, this is the thing.
We need to be a little careful not to run with it too far.
I mean, there's some things that it suggests.
I think it suggests a more flexible,
mode of brain functioning
if you're not getting stuck in modules
or the modules aren't excessively cut off from each other.
But you see different things with different presentations.
If you were to look at cognition,
sharper cognition is actually associated
with more modularity.
So it's a rule that's a little slippery
and we need to be careful with it.
I just, again, I'll forgive me for intruding,
but I have friends who are,
I would say are on the spectrum,
who are very linear in their thinking
and extremely intelligent in the kind of classic sense
of being able to ratchet through hard problems
to arrive at a solution.
And then I have friends who are,
let's just call them what they are,
from the creative communities outside of science
that are very expansive.

They see connections between many different things,
but sometimes you have to, not all of them,
but you have to catch their ideas with a butterfly net.
And oftentimes what they're saying doesn't,
sometimes just doesn't make any sense.
Now they also produce incredible creative works,
but to have a conversation with them
is anything but a linear experience.
They're not random thought generators,
but there's a non-linearity or randomness
to their processing that's distinct
from these other folks that I'm describing as on the spectrum.
And of course it's a spectrum.
There's a whole range in between.
It sounds to me like there is some therapeutic value
to being able to move along this continuum
from the more linear to the non-linear.
Is that correct?
Well, I think so.
Yeah, it's resonating what you're saying.
It's speaking to my intuition that,
you could be very passy, passing things up,
chopping things up like an analytical scientist.
A splitter.
A splitter as we say inside.
You're either a lumber or a splitter.
Yeah.
Well, the way I'm being very particular
about when to call something psychedelic,
that kind of passy analytical way of thinking you would,
you might associate with a more modular system.
Whereas the system that's more globally interconnected
and open, yeah, might be more flexible
and creative and divergent in the associations and so on.
So yes, that's speaking to my intuition
to how you're describing it.
And I imagine if you take severe psychopathology,
severe mental illness, like a depression,
I've always thought that there's something intuitive
about the term itself,
like a depression in a landscape, you know,
which is a whole physical depression,
that it's easy to fall into.

And if you do, it's hard to get out of.
So almost, if I understand what you're saying correctly,
almost like getting stuck at one location
on this continuum, because most people don't reside
at one extreme or the other full-time,
then kind of migrate back and forth
between expansive states and more linear states.
Like you do with low mood, you know,
if you're healthy and inverted commas,
you can feel your low mood, your disappointment,
but you can spring back, but someone with...
And you know you can spring back, right?
Whereas the suicidal, depressive person
or a suicidally depressed person,
somehow, at least in my understanding,
there's something about the extreme depressive states
and extreme anxiety states,
something my laboratory is a bit more familiar with,
anxiety, which alters the perception of time,
such that people feel like that negative state
is going to go on forever,
or that if it goes away, that it's going to return at random.
Kind of a vulnerability to the time domain.
Yeah, yeah, it's so tragic,
but that cognitive bias in depression
that everything's hopeless
and that there is no light at the end of the tunnel.
Yeah, so, you know, if you were to get stuck in that rut
and have that bias, then you're cut off from other things,
other sensory modalities or modules, you know,
cut off from the world, cut off from other people,
stuck in your inner rut.
And so, yes, I think we're sharing this intuition
that a decrease in modularity
or an opening up of the system, the brain,
could relate to an opening up of the mind
that is kind of enduring after the psychedelic dosing session.
And yeah, and the third replication
was to see in healthies an improvement in wellbeing
because they're healthy, we don't look at depression.
So these are people that are healthy walking into the trial?
Yeah.
Take psilocybin twice.

Well, actually they do,
but the first dose is one milligram,
which they don't feel, it's a placebo dose.
What a quote, micro dose.
Yeah, we stick EG on their heads
to measure their brainwaves during each dose
and one milligram, you see no change.
So we, I think-
Take that, you micro dosers,
you know, I'm just kidding.
I mean, I think against the micro dosers,
I've always just been a little bit skeptical
based on my conversations with the scientists
actually doing the work with psychedelics,
it seems like the answer keeps coming back.
Do one or two, maybe three macro doses
in a controlled safe setting?
Well, that's compelling.
The evidence for that is compelling
and that's what's making all the difference right now.
And micro dosing is just appealing,
but again, you know, science isn't about
what we want to believe.
It's about what's actually coming through
and what seems to hold up, you know, to testing.
I'd like to just take a brief break
and thank one of our sponsors, which is Element.
Element is an electrolyte drink
that has everything you need and nothing you don't.
That means plenty of salt, sodium, magnesium and potassium,
the so-called electrolytes and no sugar.
Salt, magnesium and potassium are critical
to the function of all the cells in your body,
in particular to the function of your nerve cells,
also called neurons.
And we now know that even slight reductions
in electrolyte concentrations or dehydration of the body
can lead to deficits in cognitive and physical performance.
Element contains a science-backed electrolyte ratio
of 1,000 milligrams, that's one gram of sodium,
200 milligrams of potassium and 60 milligrams of magnesium.
I typically drink Element first thing in the morning
when I wake up in order to hydrate my body

and make sure I have enough electrolytes.
And while I do any kind of physical training
and after physical training as well,
especially if I've been sweating a lot
and certainly I drink Element in my water
when I'm in the sauna and after going in the sauna
because that causes quite a lot of sweating.
If you'd like to try Element, you can go to drink Element,
that's lmnt.com slash Huberman
to claim a free Element sample pack with your purchase.
Again, that's drink element lmnt.com slash Huberman.
Would you say that's right, that one or two or three sessions
and how far apart are those typically spaced in time?
Yeah, typically one, two, three weeks across the sites
is the way people are doing
the psychedelic therapy dosing sessions.
Two sessions, Hopkins Imperial, NYU,
that's been a kind of default too.
We actually used three in a current anorexia trial,
psilocybin therapy for anorexia.
Two patients left to see after 19
who've gone through the trial.
Very exciting results there.
You're seeing a alleviation of the obsessive thought
about food and willingness to consume
even healthier amounts of food.
Yeah, even improved weight at the long follow-up.
So critical, we did an episode on eating disorders
and I learned that anorexia and nervosa,
which by the way, folks, the rates of are not increasing.
It's been pretty stable through time,
despite what's said about social media and et cetera.
But anorexia and nervosa being the most deadly
of all psychiatric illnesses,
which is a big statement because, you know,
manic depression, so-called bipolar depression
has a 20 to 30 times the typical suicide rate.
Basically, many anorexia, people with anorexia,
I think is how it's now, is what one says,
not anorexics, but people with anorexia often die.
Many of them die.
Yeah, so tragic, so often young people as well.
And similarly with suicide in terms of premature death.

So the tragedy with psychiatry is so strong and there.
So it's so rewarding to be doing that trial
and to be seeing good results.
I have to check myself a little bit
that I'm reporting on it in this really promissory way
and the trial isn't yet publicly released and published.
So it's still ongoing as well.
But that was three sessions.
It is three sessions and I can't say what the dosage is
because we still have, there is a blinding component,
but there are three dosing sessions in there.
Let's see now, I think they're two weeks apart
and we do the follow up, yes.
I'd like to close out this description of the journey
and the trip by extending past the day
when people actually take the drug into this,
what I've heard described as the integration phase.
You have to reintegrate, right?
All this increased connectivity during the session,
hallucinations, insights, anxiety, letting go,
maybe revelation, maybe epiphany, okay, great.
At what point is that consolidated?
Meaning are these patients or subjects in studies
having daily conversation with their therapist?
Are they journaling every day?
And I want to keep in mind that most people
are not going to be part of a clinical trial.
And of course here, we're not suggesting
what people do or not do,
but let's just put it this way,
we're people to use psychedelics.
What is the way that people can maximize
on the neuroplasticity and the brain changes
in a positive way in the days and weeks afterwards?
In other words, how long does this so-called integration last?
And how far can we take this?
I mean, I could imagine that how often one chooses
to think about the insights could also have an impact.
Because clearly people went to raves,
clearly people did psychedelics in the 60s.
We don't know if clearly people do psychedelics now,
but we don't have data on those people.
You have access to the understanding

of how they're spending their time
and the therapeutic outcomes,
which we haven't gotten to the numbers yet,
but again, are incredibly impressive.
In upwards of, as I understand it, 60% or more,
people getting relief from depression.
Yeah, 70, yeah.
70%, incredible, especially when compared
to the typical anti-depressant treatments and so on.
So what is this business of integration?
How is it done properly?
Yeah, yeah, gosh, well, how long does it last as well?
A lifetime, you know, life is a journey,
like a trip is a journey, and there's always work to do.
And I was, Jack Cornfield says,
after the ecstasy, the laundry.
I love that.
Yeah, there'll be other good ones as well.
I forget them.
But yeah, so the work's ongoing, and yeah.
But this gives you a foot up.
It enables people to do the work more easily,
and that's true.
The classic psychedelics is also true,
very true of MDMA therapy for post-traumatic stress disorder.
It's really giving you a leg up,
making it easier to do very, very difficult work,
going back to a trauma, trying to digest it,
process it, integrate it.
So it's such an essential component of the treatment model.
But one has to be realistic as well.
You know, by saying, oh, integration lasts a lifetime,
well, people delivering a service
can't be there for a lifetime.
So what's the answer there?
And people are wrestling with that issue right now.
And I think one of the solutions might be
that it's, in a sense, on you to a point, you know?
The therapeutic team can treat you to a point,
and then it becomes what you might call practice.
In a similar way, that meditation is a practice.
It's something that you have to keep up,
and if it slips, then things could slip,

and that's the way it is.
Or you have another psychedelic treatment, you know?
So people have even used this term of practice
in relation to psychedelics,
where there's a psychedelic practice,
like there's, you know, a meditation practice.
But I'm using meditation intentionally here
because I actually think that meditative practice,
spiritual practice, elements of spiritual practice
could be a very important compliment to psychedelic therapy.
And I think it's probably doing something similar
in terms of promoting an ability to sit with
a former colleague of mine said it quite well
in relation to psychedelic therapy
versus chronic pharmacotherapy,
or like SSRIs being on them all the time.
So psychedelic therapy allows you to sit with
rather than sit on, and I thought that was quite good.
Yeah, so, you know, the meditation, the mindfulness,
the ability to, yes, be present-centered,
but also present-centered and accepting.
So if things come up, you can watch and process
and then let go.
That holy grail of mindfulness, you know?
You know, awareness without reactivity, respond.
You know, I grew up in the Bay Area
and you'd hear this language, right?
And I'm not being disparaging this.
I have friends that are on the board of SLN
and work down there, you know, and I've gone there
and it's, you know, and yet you hear these terms, right?
Be responsive, not reactive,
which to a neuroscientist is like greats on me,
which probably just means I have issues,
but then surely I do.
But, you know, it was like, what does that mean, right?
It's sort of saying like, oh, to be the observer,
but not be drawn into the experience, you know?
And again, I don't want to be overly reductionist,
but what I find so compelling about the emerging data,
is it really data on psychedelics as treatments
for depression and trauma, namely psilocybin and MDMA,
is that it really seems to allow people this space

that is so commonly thrown around, you know,
giving space between stimulus and reaction.
I mean, Victor Frankel talked about this,
but you know, I've been reading a wonderful book
called The Prince of Medicine,
Good Dates Back to the Origins of Medicine,
very dense book, people have been talking about this stuff
and thinking about this stuff for thousands of years.
Psychedelics seem to give people access
to that better version of self, which is remarkable.
What's also remarkable, it's perhaps worth pointing out,
is that five years ago,
I never would have been comfortable having this conversation.
I would have been afraid to lose my job.
Stanford Magazine this week,
just published an entire issue about psychedelics
with how ketamine works, MDMA, psilocybin,
with the appropriate cautionary notes in there,
but clearly times are changing.
Speaking of which, I know you're doing a trial
on first time use of psychedelics.
What inspired that?
And what are you observing?
And as you tell us that, please give us
a few of the key contours.
What's the dose?
How old are these subjects?
I'm assuming it's men and women.
Are they suffering from depression or not?
What kind of, what's the landscape of that study?
And I realized this is still early days of the study,
or maybe it's close to completion.
It's not yet published, however, correct?
It's not published, it's not submitted.
It is completed.
So this was another one of our COVID studies in a sense,
meaning COVID hit and we had to finish the study,
and it was hard to finish the study because of COVID.
That was true of our psilocybin therapy
versus esotalopram, Lexapro trial,
which is published, New England Journal of Medicine,
This was 20, that paper, by the way, folks,
will provide a link to in the show note captions,

as well as some of Robin's other papers.
I think that 2022 New England Journal paper
is really fabulous, given it's the different dosages
and the comparison to essentially what is micro dosing
and the comparison to esotalopram.
Yeah, that's interesting that you link
the way we gave small doses of psilocybin to micro dosing.
We didn't think of it that way.
We thought it was just a necessary placebo
for the big dose, the 25 milligrams.
So that we could say to everyone,
we're giving you psilocybin and not be lying.
Yeah, for those who got esotalopram,
Lexapro for six weeks,
they got a very, very low dose of psilocybin,
but it allowed us to standardize all the psychotherapy
and so on.
But the other study that you're referring to
was in Healthies, Healthy Volunteers,
middle-aged, average age, I think was 40.
So not your typical student study
that is so often the case in psychology research,
all the undergrads end up volunteering for your study.
So this is more of an age range and also,
I think it was an equal proportion of male and female.
All the staff actually were female,
which the staff were very proud of.
Although it produces its own potential confound, right?
To have all one sex of staff.
Possibly, yeah.
They did a good job in the sense that
we saw significant improvements in well-being
at the end of the trial.
So let me describe the design.
It was a repeated measures design, meaning people come in,
you collect your baseline data and do a brain scan
and you give people a placebo.
We gave people a placebo
and actually let me rewind a little bit.
Everyone's Healthy Volunteers, middle-aged,
never taken a psychedelic in their life.
None of them, entirely, you know,
fresh virgin people coming in.

And the plan is to give them their first
ever psychedelic experience.
So that's what we did in the study.
But to do it, we have this repeated measures design
where they'll first get a placebo.
And we have the placebo so that we can do all the procedures,
all the therapy, all the music listening,
but not give a whopping dose of psilocybin.
Again, we gave them a placebo dose of psilocybin,
one milligram.
We stick EG headsets on during the experience
to record the brain activity from the scalp,
the oscillating electrical activity.
And we do the MRI scanning before and after
to see deeper into the brain.
And we can look at the functional connectivity
that we were referring to earlier
and also properties of brain anatomy,
which we did in this study.
So the short story is that all of the changes
that we saw both psychologically and neurobiologically
were seen with the 25 milligrams.
It all happened with that big whopping dose.
And what did we see?
Well, we did see significant improvements
in psychological wellbeing.
We saw what I call the entropic brain effect,
which is actually formally quite accurate.
We see an increase in the informational complexity
of ongoing brain activity recorded with the EG
on the dose of psilocybin.
The activity becomes more complex.
It's harder to predict across time.
It's more informationally rich.
And that effect correlates as it does very reliably
with the magnitude of the subjective effect.
So the bigger the trip,
the bigger the centropic brain effect.
Now pretty well replicated finding.
But then the MRI, seeing deep into the brain
was probably our most exciting result
where we didn't just see some functional brain changes,
but we've seen some anatomical brain changes as well.

And we used a technique called diffusion tensor imaging
that looks at the cabling of the brain,
the white matter tracts.
And we saw a change in major tracts.
So we sort of limited our search space
to really thick tracts, really thick fibers.
And the fibers that came through as changing
were ones that traveled between the prefrontal cortex
and the thalamus and the striatum.
There were two tracts, two prefrontal tracts that changed.
And they changed in the direction
of a decrease in axial diffusivity,
which could be interpreted as tract integrity
where a decrease would be an increase in tract integrity.
It is something that you see in the developing brain
that axial diffusivity decreases
as a brain goes from being a baby
to being an adult, axial diffusivity goes down.
And then in aging and pathologies of aging,
axial diffusivity goes up.
So this is in the opposite direction of the results
you talked about earlier in terms of brain connectivity
of a sort of increased communication across areas.
If I understand correctly,
and I'm perfectly happy to be wrong by the way,
that this decrease in axial diffusivity
is translates to a higher fidelity of communication
between the prefrontal cortex
and the thalamus and striatum as opposed to less.
And your description of this is somewhat like the transition
from babyhood and childhood to adulthood speaks to the same
where we know that there's a massive culling of connections
as opposed to growth of connections.
So in other words, as we get older,
we get better at doing certain things
and less good at doing potentially most everything else.
Is that right?
Ish, because the change was anatomical and not functional.
So the other stuff is really measuring communication
in the brain by looking at how the activity fluctuates
across time and whether those fluctuations in activity
are synchronous between regions.
And if they are, we say they're functionally connected

and we infer that they're talking to each other
because they go up and down in synchrony.
But when it comes to the anatomy,
we're talking about the just static material stuff.
And so we're seeing the fibers
in a property of the fibers change.
At least that's what we think.
And recently we had an independent person come in
and reanalyze the data
because one of those things incredible finding
requires incredible evidence, really strong evidence.
And I would say the evidence at the moment is one study.
So we need to be cautious on that.
But we did reanalyze it
and use this correction procedure, free water correction
to be more sure that it was a change
in the actual microstructure
rather than something to do with the extracellular space,
the water surrounding the fibers.
And it came through.
In fact, the change was strengthened
by doing this correction step.
So these are, this is neuroplasticity
as the consequence of one first time session
with 25 milligrams of psilocybin.
Yeah, yeah.
So we're excited and the two different,
the second analyst coming in wasn't sure she believed it.
And then she thought this correction technique
might kind of kill the result and then it came through.
And she's like, okay, now I'm excited too.
So we'll see, we don't know what it means.
What does it mean functionally?
We don't know.
How did the people change?
Well, psychologically, as I said, well being improved,
we did look at their cognition
and we used a cognitive flexibility paradigm
that looks at people's ability to notice a rule change
and then flexibly adapt their behavior
based on noticing this rule change.
And people improved after the 25 milligrams
and didn't significantly improve after the placebo dose.

There weren't correlations with the DTI change,
that the cabling change and the psychological outcomes.
But with these studies in smaller sample sizes,
you don't always see those correlations come through.
So it's something, we don't know what it means,
but it's a change in brain anatomy
that's in the opposite direction to what you see
in an aging brain or with pathology of aging.
And it's what you see in a healthy brain
as it goes from normal neurodevelopment into adulthood.
Very, very exciting and intriguing.
And I appreciate that you highlighted
that it's just one study,
although from everything you've said,
it sounds like it's been done with immense rigor.
So we will eagerly await the publication of that study
and so we can peruse all the data and the subsequent studies.
I want to hear a bit about the study
that you have been carrying out on the use of psilocybin
for the treatment of fibromyalgia.
I'm intrigued by fibromyalgia because I have a good friend
who also, I won't reveal who it is.
And no, it's not me, I have a friend thing,
who also is a scientist who sits at a fairly high position
in the National Institutes of Health,
who quietly has expressed to me
that they are incredibly frustrated with the fact
that the standard medical community
has largely ignored fibromyalgia.
And that for many years it was kind of lumped
with things like chronic fatigue syndrome and other so-called,
again, so-called, I'm not saying this,
but people often refer to these as,
oh, it's psychosomatic, that's all in your head,
which as a neuroscientist is a ridiculous statement to hear
because it's all in your head,
your brain is in your head after all,
your physiology and your psychology
are influencing each other, of course.
And the world is starting to appreciate that more.
But first of all, maybe you could tell people
what fibromyalgia is, what inspired you to do a study
on fibromyalgia using psilocybin of all things,

because that's surprising to me.
And if you are allowed to,
or if you have access to the data in mind,
share with us a little bit about what you're discovering
in that study.
Sure, yeah, happy to.
So again, it's psilocybin therapy
and the population is fibromyalgia syndrome.
So this is people presenting with a generalized chronic pain.
So unlike some other pain disorders
where the pain is focused,
you can say it's my lower back,
which is very common, chronic lower back pain,
this is more generalized.
And for that reason, it's hard to sort of know what it is.
And that's why it's been a controversial space in medicine.
And it's been, yeah, it's had that charge thrown at it
that maybe it's psychosomatic.
And just to your point, is anything ever, you know,
independent of the mind anyway.
But this is actually a fascinating space
for how, you know, subjective experience,
the lived experience and the mind can influence the body.
Because there's some really interesting literature
around the etiology, like how the pain has come about.
In a sense, like what caused the pain?
What's the story there?
And the head of the trial, I would say to my colleagues,
let's just be careful,
because there is some fascinating literature around things
like a background of trauma.
And how that can relate to issues related to inflammation
and how that can express into things like fibromyalgia syndrome.
I just said, be very careful there,
because if you go in with an assumption
that there's some very trauma, for example,
then there's that whole other side of psychoanalysis
that massively tripped it up around false memory and so on.
And so please don't hold prior assumptions
that you're going to uncover very trauma in every case.
Now, the team have treated, I think, eight people.
And it is going very well.
Again, I just want to be careful with how I describe it,

you know, to manage expectations and not get too carried away.
But I check in with the team every week
and they're still based in London doing the work.
And it's remarkable what I hear about the profound experiences
that people have under the drug.
In this study, we only give one dose.
It's a very mechanistic study.
We actually have the EEG cap on in the sessions,
like in the Healthy Volunteer Study,
but this time now taking it into a clinical population.
So they're wearing an eye mask under the influence
of 25 milligrams of psilocybin.
Most of them probably have not done psilocybin before.
So it's a little bit like the first time study in some sense.
They have fibromyalgia that's debilitating in some way.
They don't want it, obviously.
And during the session, are they thinking about their pain?
Are they being told to think about their pain?
They're not being told to think about the pain.
In fact, as I understand it,
while there is a therapeutic model around acceptance of the pain,
it isn't, unlike some of the PTSD work,
you aren't encouraging them to focus on, you know, the index trauma
and then, you know, work through it and try and digest it.
We don't do that with the pain.
So the pain's there, but there isn't an invitation to focus on it.
And that's probably one of the differences with classic psychedelic therapy
versus MDMA therapy.
Arguably, MDMA therapy is more like,
it's a bit closer to traditional talk therapy,
where there is more dialogue.
People are able to talk on MDMA.
In the MDMA trials, do you know whether or not they used eye masks?
Because this seems to be an important distinction between,
as you described, the therapeutic trip versus the trip that one does,
going into the woods and taking psilocybin in the woods or at a party
or while staring at a poster or a leaf.
Again, I'm not trying to trivialize those experiences.
I mean, obviously, they can be profound, so I'm told.
But the MDMA trials seem to involve, as you said, more directed dialogue
and sometimes even kind of empathic connection between people
by they're actually looking at one another, you know,
the eyes and eye contact being such a key part of the human social,

cognitive, connective networks.
So do you know if they put eye masks on people during the therapy?
I'm pretty sure that they have the eye masks there.
Because a lot of the MDMA work, and I was part of an MDMA trial,
was, as I understand, geared toward developing,
because it's an empathic empathy toward the self.
I'm pretty sure they have the eye masks there,
but they probably, and it's a great question because you can formally test this,
they probably don't use them as much.
The thing is, with the classic psychedelics,
if you're looking at your guides, your facilitators,
and their faces are melting or whatever, you know.
On MDMA, you just might really start to feel more connected to them.
Yeah, they might look especially beautiful.
Sure, yeah.
And yeah, there's that fascinating effect of loving the people that you're with.
And so, yeah, I imagine they talk more and use the eye shades less.
They're more interpersonal rather than like intrapersonal going inside.
They do use a fascinating terminology that some people have critiqued,
but it's a very interesting phenomenon, and it's this notion of the inner healer.
They use that language a lot.
It's been critiqued because it sounds very suggestive, you know,
and that's probably one of the vehicles here driving the therapeutic process is suggestion.
I think I have to be honest about that.
But so when they go inside, that's another term that we use very much
in the classic psychedelic therapy work, you go inside, you know,
you put the eye shades on and people are encouraged to go inside, you know.
But when they do that in the MDMA work,
especially they might be told explicitly and listen to the inner healer,
you know, in that kind of language.
You see how a cynic or a skeptic could come in and see that as some kind
of like suggestive priming or biasing.
I think they have a point skeptics often do,
but I don't think it's all of the story.
And just briefly, because it's an interesting point,
speaking to that point a bit in our psilocybin therapy versus esotelopram trial,
we measured pre-trial expectancy and we did it for both conditions.
So, you know, what kind of improvement do you expect with the Lexapro,
the esotelopram at the end of the trial,
and what kind of improvement if you go into the psilocybin arm
and get a big, two big doses of psilocybin,
what kind of improvement do you think you'll see in that?
And of course it was a coin flip as to what arm people went into

and there was no crossover.
And what we found was that it was true that we had a sample bias,
so most people had higher expectations.
On average, there were higher expectations for psilocybin
and its efficacy or effectiveness versus the SSRI, the Lexapro.
However, when we looked at the correlation
or the predictive relationship between pre-trial expectancy and response,
we saw that pre-trial expectancy for the esotelopram predicted response to esotelopram
across virtually every single measure,
all these different measures of depression and anxiety and well-being.
And I think none of the scales,
I'm pretty sure it was none of about 12 or so mental health rating scales
was there a relationship between pre-trial expectancy.
Even though it was high, it didn't predict,
pre-trial expectancy didn't predict response to the psilocybin therapy.
So that was a bit of a smash on the head for the idea
that classic psychedelic therapy is some kind of placebo response.
I think it's so important to address that question
because if it doesn't come through as it didn't come through,
then it opens up even more intrigue about, well, what is it then?
If it's not just a placebo response or a super placebo response,
like an amplification of the placebo response, then it must be something else.
And how intriguing it has a direct therapeutic action, it must be something.
And we don't yet know what it is.
I talked about the residual increase in global connectivity.
That's one possibility.
But the truth is we're just scratching the surface.
And yet the therapeutic outcomes are, again, just so marvelously impressive.
I'm curious as to why, well, there are that many labs,
but the laboratories that are focused on classic psychedelics for the treatment of depression,
and now, as you mentioned, promising results for anorexia and fibromyalgia as well,
although preliminary, very promising.
Why the lack of attention toward LSD?
Is it that the LSD trips are just too long?
Is it that they are qualitatively different?
Are there any data on non-microdoses of LSD?
And here I want to be very careful because I learned through my interactions on social media
that this term microdose is very misleading, and in some cases can be dangerously misleading
because, as you mentioned earlier, the effective psychedelic dose,
or the effective meaning that can induce a real trip with hallucinations, et cetera,
of LSD is actually in the microgram range.
So some people hear microdose and they think microgram of LSD is a micrograms,
micrograms is a microdose, when in fact a macro dose of LSD can be measured in micrograms.

So this is where, in the absence of scientific training, people can really go astray,
or even in just lack of understanding of the metric system,
and since now you're a recent rival to the US, fortunate for us.
England's loss is the US's gain by a Robin's lab move from England to the United States recently,
so score one for us.
But why isn't there more use of LSD in these trials?
I think it probably is the duration of the trip.
It used to be stigma, and it was easier to get your psilocybin studied through
because others were, they were getting that through.
So there was still Franz Vollenweider in Zurich in Switzerland,
and then Roland Griffiths coming along and doing the psilocybin work at Hopkins.
So you could appeal to that president and say, well, they're doing it over there,
you know, can we not do it in little England?
So that's how it worked for us.
We did actually go on and do an LSD study once we kind of laid the foundations for doing this kind of work,
and it was a brain imaging study.
It was a really extensive one, actually, where we used both MRI and another modality called MEG,
sort of SuperEG, in a sense.
But, you know, why didn't we, why didn't that turn our heads to think,
oh, should we not be doing our trials with LSD?
It does have something to do with the pragmatics,
like a study day with psilocybin is long enough.
So four to six hour trip.
Yeah, and the FDA asks us to have the people in the lab until eight hours post dose,
which personally, I think could be quite excessive, especially if it's a low dose.
You know, if you have that in the placebo condition as well, it becomes impractical.
Yeah, scientists are not paid nearly enough to warrant the, there's no such thing as overtime
for the graduate students in postdocs.
Yeah, it's often that there's, you know, more junior members that are doing that really hard work.
It was described very well to me by a student when I was a graduate student said to me,
they really can't afford to pay us by the hour, because we used to work.
He was an electrophysiologist, so he would run experiments.
No joke, folks, three to five day experiments, sleeping in bouts of two hours here or there,
in a dark room with a bunch of equipment and recording.
So these are long, long acute electrophysiological recordings.
So yeah, no scientist does it for the money.
I promise you that there is money in pharma.
There is not money in personal income.
It's not lucrative for the basic scientist.
So yeah, LSD is what, anywhere from eight to 15 hours, something like that.
Yeah, 15 would be a little long.
You'd be worried if you were still tripping at that time.

You were the really big dice.
No, just kidding.
But yeah, eight hours plus and dose dependent.
Yeah, if it's a bigger dice, it's a longer experience.
But you know, if you're going to dose at say, you know, 10 a.m. in the morning,
which is more or less how it often goes, then that's 6 p.m. still feeling the effects.
And then how long do you wait now to kind of close things out before they can go home?
Even with psilocybin, yeah, people still work into the evening.
And the staff were always there later, of course, because they got to pack up.
And yeah, so these are long days.
And it's just, it's too much, you know.
That makes sense.
You know, practical constraints.
I learned from a recent guest on this podcast that we recorded with Dr. Sachin Panda,
who was a colleague of mine when I was down at the Salk Institute,
pioneered a lot of the studies on so-called intermittent fasting.
That the reason the intermittent, that the eating period in these studies in animals
and now on humans is eight hours, the sort of feeding window in these studies
is because the graduate student was going to otherwise lose their relationship
because their significant other says, listen, you can be in the lab for 12 hours.
That meant some hours before the experiment, then eight hours,
and then some hours afterward, but you can't stay in there longer.
And many people use the eight hour feeding window as a consequence.
So the science has to exist and be carried out in real world frame.
It does.
Yeah.
It does.
MTMA is a little bit, a little bit shorter, right?
It's about a four to, it's also about four to six hours, correct?
Yeah, it's kind of similar to psilocybin.
Yeah, it is.
And actually in the maps work, they re-dose after a certain point.
So the boost, the booster.
They have a booster or optional booster.
Yeah.
So, so there is that.
And now people are thinking, well, even these psilocybin sessions are long and expensive.
And if you have to have two staff members there all the time, that's expensive.
That's where most of the expenses is in the staffing.
So can we bridge the experience, make it shorter and get away with it
and get, get similar kind of therapy outcomes.
So there's a lot of interest in that direction.
May I ask about, I'm sorry to interrupt, but I want to make sure I don't forget to ask

about combination psilocybin MDMA therapies.
The reason I ask about this is, and here truly not me, but I know people who do self-administered combination psilocybin and MDMA.
I think I have this, right?
I think it's called a hippie flip.
There's another one that involves LSD too.
Again, I'm not suggesting people do these kind of drug combinations, but the way it was described to me was that the psilocybin, because it's so serotonergic, sometimes can be not a downer, but can have a bit of a kind of a, kind of a murky feel to it, some really deep introspection, sometimes in the darker realms of one's psyche, depressive thoughts, et cetera.
Not that it necessarily stays that way throughout the trip, but that the MDMA, because it has very strongly serotonergic, but also dopaminergic.
I mean, it has an amphetamine component, a cocaine-like in fact.
If you've ever seen someone on MDMA, their pupils are about the size of quarters.
For a reason, they're in extremely, extremely autonomic arousal compared to a sedative, which by the way would constrict the pupils.
They describe the use of MDMA to kind of balance out the kind of affect component of it.
What are your thoughts on combination psilocybin, MDMA?
Does this hold any therapeutic potential?
This is obviously backyard chemistry in the sense that people are kind of cowboying this stuff on their own,
which again, I don't really recommend.
I like to see the science go first, but I understand this is how it works in the real world.
What are your thoughts on combining compounds?
I guess they're cowboying it in recreational contexts, but also underground therapists do work with this combo.
That's what I'm referring to.
I'm not talking about people parting with this stuff.
I'm talking about there are thousands now of therapists that offer psychedelic therapies illegally, really, because it's not legal, at least not in the US to possess or sell, but that are doing this.
That's really why I'm asking.
I think there's something to be said for when I have to be careful with this as a scientist, but if they're doing it, are they using some kind of trial and error?
The same is true, of course, with the longer history of psychedelic plant medicine use.
If by plants we include the fungi as well, so in the extended sense, plants, there will have been trial and error there.
It might not be as systematic as the science we do today, but maybe there's been a learning process and maybe what they do, they've come to because they found it works.
By that principle, I'm interested in that combination and whether it does offer some advantages.
Maybe in certain patients, one of the buzz terms in medicine these days is precision medicine, precision medicine and personalized medicine.
Maybe there are certain cases where introducing, say,

psilocybin after the MDMA or the other way round could offer some advantages.
The differences are interesting.
Psilocybin can get you to deep places,
maybe the kernel of your suffering and major life experiences and complexes
that are causally linked to whatever the pathology that you're presenting with,
but it can do it sometimes quite aggressively.
If it's, say, post-traumatic stress disorder, it can be overwhelming
and you can fight it and really it's that.
It's that the resistance is really challenged and they fight back
and the therapeutic breakthrough and the progress isn't happening
because you've agitated the defense mechanisms.
Whereas what MDMA offers is something arguably more directionally reliable
in terms of the valence.
It's more directionally positive generally in MDMA experience.
Hard to have a bad time on MDMA, to be quite blunt.
One of the concerns I had with MDMA, I've never done it recreationally.
I have not and have not ever done it recreationally,
but when it was done in this therapeutic setting,
I realized because there was music on at the beginning,
I actually asked them to turn it off
because I realized that the music was becoming such an attractor to my attention
that I suddenly was starting to think about music and my love of music,
which was not the focus of the session that I was there for.
And I'm glad that they did turn the music off because the moment they did,
I was able to drop in within the, I'm asked to sort of go inward
and address some certain issues that at least to me felt key and productive.
So that seems to be the kind of hazard with MDMA is that it's such an empathogen
that one could start to, you could go down any number of different rabbit holes.
Yeah.
Yeah, but it's also, it's a strength because you, well, you know,
the classics like Pseudocybin can take you there very reliably,
but maybe a bit aggressively, MDMA makes it easier to go there.
And that's its strength.
And that's why that marriage of MDMA therapy for PTSD in particular is a good combo.
It works because you are going to go there in a sense.
You have to really make the therapeutic progress.
You're going to have to go back there,
but we're going to set it up so that you can go back there and feel safer
and more trusting and be able to go back there.
Whereas you've never otherwise been able to go back there without, you know,
dissociating or having, you know, horrible flashbacks and so on.
So that's the strength that it offers.
I guess the limitation would be that maybe it doesn't take you as deep as the classic

psychedelics.
And I tend to think I'm biased on this one that there's a kind of honesty to the classics in that it is, it is hell as well as heaven, you know, and that's the psyche.
It isn't all roses.
I really appreciate that you bring that up because I think that there's such a fear of so-called bad trips.
There's such a fear in non-psychotic states to avoid the painful and everything we know from trauma and the treatment of trauma.
And we've had several guests on here.
My close colleague, close, close colleague at Stanford, Dr. David Spiegel, our associate chair of psychiatry is a clinical hypnotist, amazing, amazing human being and scientist and clinician as really just, you know, like embedded this in my mind that the only way to deal with trauma is to get right up next to that trauma to the point where some relief is experienced.
There is no other real way.
And so I really appreciate that you're saying that the classic psychedelics may offer the, with a very strong nudge, perhaps the opportunity to get into the uncomfortable in a way that MDMA or some non-classical psychedelics perhaps do not.
We were talking about time frames or duration of trips and these different compounds and how they differ and how they're similar.
I'd love for you to educate me on DMT and some of the work that you're doing with DMT.
My understanding is that it's a very brief trip, minutes, people I know who have done this.
Again, therapeutically, actually, I'll just point to one very exciting, I think, group and initiative, which is the Veteran Solutions Initiative, which is a group.
This is carried out in Mexico, but in conjunction with laboratories at Stanford and elsewhere who are evaluating the neural changes.
And this involves Ibogaine, which is Ibogo, which is a very long duration psychedelic, 22 hours or more, followed by a, I think, one or two doses of DMT.
This is for veterans to deal with any number of issues.
Appears to be working with great success and I've spoken to several people who've gone through this
and the way that they described DMT, almost across the board, was quote,
here I'm just pulling quotes, right?
Anecdata, the most profound experience of my entire life, even greater than the birth of my children, quote, like being attached to the shockwave of an atom bomb, quote,
there's no way I would do another dose because the first one was so unbelievable, interesting, by the way.
I think most of us, including me, would think, why wouldn't you want to do it again then?
But this idea that that was just beyond anything.
So these are significant, excuse me, these are significant statements coming from individuals who have existed at the extremes of human experience to begin with, right?
These are so-called Tier 1 operators within the Special Operations who exit and may or may not have trauma,

DMT sounds like a big deal, short duration, really big deal.
What do we know about its chemistry?
What do we know about how it's impacting brain networks?
And what in the world is going on that people are describing it as the ways I just mentioned a few moments ago?
Yes, it's a rocket ship.
If the psilocybin is like a ship leaving port, then yeah, this is a rocket ship into craziness.
Is it serotonin 2A?
It is, yeah.
So it is a classic psychedelic.
It's a direct agonist, a direct stimulator of the serotonin 2A receptor.
It's an order of magnitude less potent than psilocybin, but potency is a funny thing because it's dose dependent.
So that doesn't mean that the experience with DMT is less than that of psilocybin.
It's just that you give more of the drug.
Let's match by its stickiness for the serotonin 2A receptor, which is this kind of golden rule in psychedelic sciences that it was discovered in the mid-1980s,
this tight relationship between the affinity or the stickiness or the binding potential of a psychedelic for the 2A receptor in particular, serotonin 2A,
and its potency and the stickier the drug, the more potent.
So LSD really sticky, very, very potent.
You only need those tiny microgram doses.
So DMT by its affinity is a little less potent, but by its effects when you give a standard dose, it's just wild.
And DMT because there's another compound called 5-methoxy DMT, which is a bit different pharmacologically and subjectively.
Similar in terms of its kinetics, it's another rocket ship.
Both compounds in the wild, so to speak, are smoked often.
DMT and 5-mEO, people are vaping both actually now.
There are vape pens that have been developed for people to administer this, but more traditionally it's been a smoking thing.
This is clinically not recreationally, or both.
Both now.
I mean, you know, underground practitioners are using the vape pens.
They like them because people titrate the dosage.
They get a feel for what it is to be going into this state so that they feel they can let go and go into it.
But, and actually, I think some of the veterans work might be giving 5-mEO after the Ibogaine.
Phenomenologically, if there's a difference between DMT and 5-mEO, people might put it on 5-mEO being more of a reliable ego dissolution experience.
Less visual and more kind of all-round immersion in the greater whole loss of self-identity and just immersion in everything.
Maybe we could just talk about ego dissolution for a second because it's such a sticky, interesting idea.

I can take a step back as a neuroscientist and say, okay, ego dissolution, this idea that from a very early age we have a concept of self,
and that I wake up every morning and I know I'm me and not somebody else, and presumably you do the same, and most people do the same, I would hope.
And that there are objects in the world and people in the world beyond us, but every time I hear about ego dissolution,
it sounds like it's a kind of a temporary elimination of the idea that things stop and start and stop between us and everything else.
Here I'm not trying to sound philosophical or metaphysical, but there's sort of the molecular continuity of life or all that, all just little bits.
Which is true.
Which is true.
Not a functional way to go through the day because you want to make a cup of coffee, you don't really want to get lost in that if your goal is to make a cup of coffee.
But what is the power of ego dissolution?
Is it the idea that we belong?
Is it a sense of meaning?
Is it the sense that we're not as important as we think, which of course could be a wonderfully useful way to go through life,
you know, to think that we're not as important, like we are vitally important, but we're not the only thing, right?
Because I do believe connection is vital, as most people do.
What is ego dissolution?
And why would this serotonin 2A activation cause that?
That's remarkable.
Yeah.
Great questions.
I mean, what is it?
You alluded to it with the start-stop, I think, you know, because you could define it by boundaries in a sense.
What isn't me is as valid here as a developing sense of what is me that a child develops at whatever age.
And so a major characteristic of the ego dissolution experience, rather than just a negative, a thing going away, my sense of self going away,
is the positive, oh, now I feel interconnected with other people in the world at large.
And I realize, you know, that there is that molecular continuity.
And actually, that's a ground truth.
And, oh, maybe the ego thing is somewhat illusory or at least the construction of my mind.
And indeed it is, right?
Well, it is.
Yeah.
I mean, there's no transcendentalism about that.
It's just like logic.

I think about it a little bit like family.
I mean, we all know what immediate family is, but, you know, sort of like, forgive me for interrupting myself.
I do it all the time anyway.
When I teach neuroanatomy, you know, some clever student always figures out, OK, well, that's connected to that.
And that's connected.
But ultimately, everything in the brain is connected to everything else.
There's just no way around that.
That's a true statement.
Yeah.
And so you really just have to decide where you draw the boundaries between.
Where you draw the line.
Where are the modules?
What are the modules?
You could say the brain is just one big macro module.
Yeah.
And then you also want to include the body.
And now, fortunately, people are starting to embrace this idea that it's not mind body.
It's both because the nervous system extends through both, of course.
So as the same could be said of family, like we're related, right?
Not just by virtue of the fact that we're human beings.
If we did our genealogical charts, we would find a convergence at some point.
And of course, you know, this becomes a bit of a game, but then one realizes that where you draw the boundaries.
And if you draw them at brother, sister, parents, biological parents, et cetera, that's a game too.
And so it is just a construct.
Yeah.
I mean, it is a fun game.
You know, where do you draw the line and when to pass and when to collapse?
It's also a classic consideration in science when to pass.
The lumber versus the splitter.
It's brilliant.
Yeah.
But you asked this question like, well, why do psychedelics do it?
There we think psychedelics do it because the target receptors, at least, you know, classic psychedelics do it.
And that's important to stress.
So MDMA doesn't really do it in the same way.
It might soften the ego a bit, but, you know, that's debatable.
My experience with MDMA is that it's such a strong pathogen and that it can cause empathy for others.
Yeah.

Certainly you could imagine situations where one in MDMA journey and afterwards says, you know, oh, these, these my oppressors, you know, are the people that harm to me.
They, and here I'm not referring to my experience, but, you know, they did the best with what they have actually have empathy for them forgiveness, but also for oneself, that there's an empathy for self.
I know I said this earlier, that is very hard for most people to access.
Perhaps it's not the narcissist out there listening.
They'll be like, of course, empathy for self, but everyone else.
I think all the other healthy people or the healthy people other than narcissists and not picking on nurses.
I have to imagine they suffer too.
In fact, I think that's the root of their narcissism that empathy for self is not something that comes reflexively for most people.
And here I'm not talking about self-love or self-respect, but this notion of being able to see the self as not just deserving of love and care, but actually holding that in place while in confrontation with something challenging in a way that allows more, not less access to adaptive responses to that challenge.
I think that's the way I kind of conceptualize it.
Yeah.
Yeah.
I think drugs offer great scientific tools for tackling this question.
What is ego dissolution and why do drugs modulate it?
And what does that tell you about the brain?
Because other drugs like cocaine releasing more of a different neurotransmitter, dopamine, more than serotonin.
The opposite is the case with MDMA is more of an ego inflator, right?
Oh, absolutely.
People become hyperlinear, hyperlinked to their own desires and wishes, and future outcomes become an obsession.
It's the stuff of kind of American psycho and the kind of cliches and stereotypes of the 80s cocaine culture.
Yeah.
Yeah.
We did a study once actually looking at dose dependent relationship with ego inflation on one axis and ego dissolution on the other and saw that it just massively passed or differentiated between cocaine and psychedelics.
It's quite a neat study.
So cocaine makes people's egos super inflated.
Yeah.
And doesn't touch dissolution.
And the opposite is the case with psychedelics.
Is there any neuroimaging to explain how cocaine does that?
It would be a great study.

Yeah.
Great idea.
We should do that.
I have a sabbatical coming up.
I've got 12 months of sabbatical coming up.
Yeah.
I'm going to show up in your lab.
Yeah.
That's a really good one.
If it's right to finish the thread on why psychedelics and ego dissolution, we do know some things or, you know, we have some hypotheses.
And it's that the target receptors, the serotonin 2A receptors that classic psychedelics hit are heavily expressed in what these days I like to call recent brain because evolutionarily it's recent brain.
It's cortex that humans have more than any other species.
If you look at a mapping of cortical expansion from say macaque or chimp to human, it's the very same map that you'll find the 2A receptors in.
So that's the target.
And it's just easy to think that, oh, well, that could be the egoic brain, you know, and the classic psychedelics come in.
They kind of, they scramble up the activity.
That's the entropic brain action.
And in terms of, you know, the start-stop, the boundaries, that entropic action sort of spreads out the system.
It doesn't shut it off.
It sort of spreads it out, you know, dissolution.
Yeah.
And, you know, that you were talking about the headspace as well.
So that fits.
If it's, you know, if it's more capacious, it sort of fits.
The big qualifier with psychedelic therapy that the people rightly bring up is it doesn't last.
That's the paradox of it.
The paradox of ego dissolution.
So the ego might go away during the trip and you have these profound insights about the molecular continuity and how we're all one and interconnected.
And then you come down.
And however long later, you know, the ego comes back, but maybe with a vengeance and sadly, you know, things can go awry when people haven't done the work.
Perhaps haven't done the integration work and maybe ego defenses come back and, you know, and it's not a pretty picture.
How often do you see that in the trials that you do?
What percentage of the out of people coming through do you think end up with worse than they were before the trial?
It's very rare in the trials that we've done.

Yeah, but you see defenses come back.
So you do see people relapse.
That's more, you know, if you're pushing out to like three months plus in something like treatment resistant depression, that's more the rule than the exception.
Sadly, people relapse.
If their histories are, you know, histories of chronic depression, then while you might give them a window of wellness, sadly, it doesn't last.
It's not to say that it doesn't ever last.
It does.
And we have people who are in our first treatment resistant depression trial who are well to my knowledge today back at work doing fantastically well.
But sadly, the majority of relapse to my knowledge and need to do more psychedelic journeys.
Well, they can't because it's illegal.
I mean, the really difficult situation that we've been up against is that we do a trial where all of a sudden this schedule one drug becomes a medicine in the trial, or at least an experimental medicine.
We give the treatment, it works fantastically well, gives people a remission that they've never really had for however long.
And then the trial ends and they're denied that treatment and worse still, if they were to have that treatment, they would be committing a crime.
It's sort of a sick joke in a way, but that's that's the situation that we've been in.
That's a perfect segue for what I want to talk about now, which is what is the current state of legality in terms of or the progression towards legality.
I'd also like to touch on the role of let's just say incoming big pharma.
There are a lot of startup companies now trying to capitalize on these discoveries that you and others have made.
You know, the landscape out there is very unclear to me.
Maybe I'll just call out some silos as I see them.
And maybe we can draw some bridges between them if they exist.
At the ground level, not the grassroots, but at the ground level, I look to laboratories like yours, Matthew Johnson's, Roland Griffiths, some laboratories at Stanford, Nolan Williams.
Laboratories doing studying the effects of psychedelics in human beings.
So not animal models in terms of their clinical application for the treatment of depression, anorexia.
I now know fibromyalgia trauma.
Let's lump MDMA in there as well, assuming that it all works in an equivalent way at the level of kind of where the legislature is taking things.
Okay, so labs using government money, philanthropy, etc.
There are the sort of the therapists out there that are accessing what we believe are clean sources of MDMA, psilocybin, LSD to do this.
They are doing it illegally.
This is in the US or other Western European countries because obviously it's going to differ by country who are administering these things sort of on the basis of what they're reading in these studies that you all are publishing,
and also expanding on and experimenting hippie flips and combination drugs and ketamine and etc.

But let's leave ketamine out right now because it's legal, but there's that.
Then there's the, I don't want to say, it's sort of recreational slash open market, black market.
And here I want to raise a flag to the fact that Dr. Peter Atea did a terrific podcast on this recently in his own podcast, The Drive.
It's like that fentanyl, lacing with fentanyl is now showing up in MDMA and psychedelics that are purchased on the street.
So serious caution to those getting it from uncertain sources.
And then you've got pharma and then as an umbrella for all of this, you've got the FDA and law enforcement agencies, which currently say this stuff is illegal unless it's being used in a clinical trial, and if it's being interpossessing it can get you charged with a crime ranging from, I don't want to say because I don't know, but up to felonies, right, years in prison.
Okay, so can't take it through airports, can't don't get caught with it, don't buy it, don't sell it kind of thing.
So where are we going from that picture of the silos?
No, things are in clinical trials now.
Most people including myself are not familiar with how the different phases relate to the proximity to legality.
Could you just kind of give us the landscape and touch on how long you think it will be before the people that come through your trials could then go get a prescription for psilocybin or potentially buy it without the risk from a reliable source one would hope but without the risk of getting thrown in jail.
I used to live in Oakland, California.
My understanding and please correct me if I'm wrong folks don't trust this information and get in trouble.
My understanding is that psilocybin is decriminalized in Oakland, but that's not the same as being legal.
So what is going on out there?
Wow, well so much.
Yeah, I just asked 55 questions, but feel free to answer just a subset of them if you like.
Well, Oakland's a funny one.
I live close to Oakland.
There are head shops in Oakland that might be selling cannabis and cannabis related paraphernalia that are selling mushrooms as well, psilocybin mushrooms.
That's a fact.
Openly, yeah.
That's a fact.
I can verify that.
I haven't purchased them, but I've gone in and kind of checked it out like what's going on here.
Yeah.
So, you know, the police aren't going to prioritize that activity, the purchasing of those mushrooms as a crime now in Oakland because of the decriminalization.
So those head shops shouldn't strictly be selling while they shouldn't be selling.
They won't have a license to be selling licenses don't exist yet for that here.

But let's see whether they get shut down.
They probably will.
I don't know.
But there's a church, you know, in Oakland that sort of say that they're selling and it's part of sort of religious rights that they're using that church model as a loophole.
You know, the way that Native Americans can use Peote and they have a more genuine case, I think.
Because there is a history there that they're trying to kind of piggyback on that.
Anyway, that's sort of, you know, close to where we are right now.
But federally, which is really the major inflection point is the FDA and the licensing of psychedelics as medicines to be legally prescribed across the country, across the U.S. and beyond.
That is close because the key phase, there are different phases of clinical trials and the key one to know about is phase three.
Phase three trials are licensing trials.
If they're successful and typically you have to do at least two successful ones show the results to the regulators who are the FDA, the medicine regulators and say, is this good enough now for you to give me a license so that I can sell.
And provide this medicine that we've demonstrated is a medicine.
So that work has been done with MDMA therapy for post-traumatic stress disorder maps have led that work and done two phase three trials.
I think they've already publicly announced that the second trial had results consistent with the first.
We know the results of the first because they're published and they were remarkably good, something like 67% remission rates.
And long term, my understanding is some of those remission rates for trauma or years, which is different than what you're describing for psilocybin where people might need ongoing dosing.
That's true. Yeah, yeah.
But of course, just for trauma in those trials, my understanding is those MDMA trials were not focused on depression.
Yes, yes, focused on the trauma.
So that's something because that data is being filed now to my knowledge, like as we speak, and they're anticipating a decision maybe this year with roll out happening as early as next year.
I mean, that's sort of best case, I think.
I ask you when you say roll out who's real and it's the appropriate term for MDMA so called rolling about 20% of my audience, maybe 50 will understand that.
Not funny joke that I made.
Who's going to roll it out is this where would one get the MD that the clean source of MDMA meaning not laced with fentanyl not laced with methamphetamine.
Not undergone any chemical conversion to some other drug which can happen with extended shelf life, etc.
Are people going to go to their psychiatrist to get MDMA and who's going to be providing it is it going to be some big major pharma.
This seems like a serious set of issues.
It is and I don't have all the answers.
I do know that maps would be providing because they've done the work and they have set

themselves up in a sense to potentially become the provider, whether as a pharma company, which is the big question they're wrestling with at the moment.
It's very expensive to become a pharma company.
And yet they probably deserve to make the choice because they put in so many years of hard work when all of this stuff was considered like raver culture party drug.
They were the ones that spotted the therapeutic potential.
I mean we knew there was therapeutic potential based on work going back many decades but points to them and I think that I think in my opinion they should have the agency to make those decisions.
It's such a remarkable thing that's been achieved and I think they've done it all on philanthropic donations.
I think so.
Yeah, so there is this big question mark and the FDA are also asking questions about to your question, you know, who can provide this because in the phase three work and up until this point there's been a maps training.
A maps therapist training and you have to do this formal training in order to be a practitioner within the trials.
But now there's a question from the FDA whether that maps training can be the training that a clinician has to have to now be a provider.
And when I say roll out it's like offering this as a service essentially.
And so where would the referral come from?
That's a good question that I'm not 100% on the answer whether it would have to come from a psychiatrist or whether someone's sort of general physician could do that referral.
But they will be going to a provider who is licensed and certified and will have done some training and there will be a consensus on what constitutes good enough training to provide.
There will also be some stipulations on the basic underlying professionalism of the clinician who provides.
So I imagine they'll have to be a mental health professional.
I don't think they would have to necessarily be a psychiatrist.
They could be a clinical psychologist for all the dosings.
I think without question there would have to be a physician present or at least within ready access in case of an emergency.
Yes, especially with MDMA because of the propensity for cardiac issues because of the amphetamine properties.
Where is psilocybin in terms of the phase trials?
Is it in phase two, phase three?
It's in phase three.
There's psilocybin therapy work being done for treatment resistant depression by a company called Compass.
Those trials which are always multi-site so there's always a bunch of teams or labs in a sense geographically spread out that are each contributing to data that then gets massed together and is then submitted as part of the phase three trial results.
So that's happening with Compass right now.
It's psilocybin therapy for treatment resistant depression.

Those trials have just started and I think the earliest estimate that I heard in a journalistic article was because I don't think Compass would say or they wouldn't say publicly something like 2026.
2026?
Wow, so MDMA is ahead of psilocybin?
Yes, quite a few years ahead and it's more of a not a certainty but it's very, very strong position with MDMA whereas the work's only just begun with psilocybin in terms of the phase three trials.
But then you have this other situation of like however many psychedelic research centers there are now across the globe.
It was nice to, you know, we had the first one in London in 2019.
First one in 2019 is 2023 now and I don't know how many there are but so much has happened in such a small space of time.
Yes, but you know all these different indications I've been able to tell you about anorexia and fibromyalgia syndrome trying to do a trial with a colleague of mine at UCSF in methamphetamine use disorder.
He's got a trial going on in Parkinson's disease and chronic lower back pain and bipolar disorder.
I mean there's so much going on, OCD, almost the full gamut of psychiatric disorders, not schizophrenia to my knowledge, are being looked at.
So there's so much ground, you know, ground swell of activity and I think these small investigator led studies typically they're small because trials are expensive are going to be reporting positive results.
I know what we're seeing and it will be, you know, four, let's see now, at least four trials, all with really positive results and very difficult to treat disorders.
And that's just us and I know there's so much elsewhere, addiction disorders as well, you know, in my Johnson's work obviously, Michael Bogan shoots.
So all this compelling ground swell, it's really something.
And yet, you know, the system to really make a big breakthrough in terms of licensing is of course slow and it's that can frustrate people but it has to, it has to be done properly.
Yeah, else we revert back to what happened in the 70s, where there was a lot of interest in psychedelics.
It's kind of interesting to me there was a close juxtaposition of meditation and kind of behavioral approaches to self-directed state change and psychedelics and meditation kind of made it through the hatch.
I mean, there were some years where it was considered kind of counterculture, woo magic carpet, weirdo stuff by Western science.
But now, I mean, there are tens of tens of thousands is not an overstatement of quality studies exploring how meditation can provide advantages for the mind and even for mental health.
And psychedelics are now catching up, but they used to be close cousins in the in the cultural framework.
But the problem was, I think psychedelics were viewed as making people crazy and university professors lost their jobs for having discussions like the one that you and I are having right now.
And some people went to jail, but mostly mostly people either left academic institutions or lost their jobs.
Whereas now these are some of the these studies of the sort that you are doing and that are taking

place at Stanford and Hopkins and elsewhere are some of the greatest magnetic pull for philanthropy for universities.
Donors are very interested in supporting these sorts of studies because they and their family members and people they know suffer from psychiatric illness for which the current big pharma approaches simply have not worked.
So it's sort of interesting to me that what once was seen as kind of poison is now being viewed as a potential therapeutic.
It's not just interesting. I think it's it hopefully it speaks to the evolution of the human species.
People seem to be coming more open minded about becoming more open minded.
That's a good one. Yeah. And yet, yeah, it's there's so much that's happening so fast. And there's, you know, there are elements of it's it's complexifying the space.
There's there is critique. There's been some bad practice in psychedelic therapy boundary crossing issues that have caused some scandals.
That's too bad.
Isn't it?
Well, you know, I think to the gene therapy, right, it just takes one bad incident. You know, gene therapy was on a fast track three decades ago.
And then what sadly, a child died in a gene therapy trial and it's like shut down gene therapy practically for half a decade.
And then it slowly started ratcheting up again.
Gene therapy broadly defined and now we're in the age of, you know, potential directed gene therapy using CRISPR and things of that sort, which makes people some people cringe and other people very excited.
You know, if you have Huntington's in your family, CRISPR is like the most exciting technology ever because you could potentially eliminate it from your family line going forward, of course.
So I just really hope that we can be balanced as this all plays out because it could go similar way given the stigma given the history that people be very twitchy with with some isolated incidents.
And, you know, overgeneralize them, perhaps.
In a sense, shining a light on them, I think is important that that has happened recently is important because it really drills home how important it is that this work be done right and what the necessary safeguards and standards should be.
Yeah, it won't be, it won't be an easy road forwards, but but let's hope, you know, we've got to hope that it succeeds because current treatments, you know, people talk about the mental health crisis and to your point earlier about anorexia rates,
it's not always actually the case when you look at the epidemiology, when you look at the data that you see a big inflection in, you know, diagnoses or cases of psychiatric illness.
I would say it's more that the treatments haven't moved.
They haven't really progressed.
They haven't got any better since the 1950s, more or less.
And new drugs have been more of the same.
So there haven't been any paradigm shifts.
And that's why I get a little impassioned when I talk about psychedelic therapy and that point that this is something different.

It's not, you know, a drug every day.
That system is not cutting it, you know, do we really want to keep on with that system?
Sure, you know, not everyone will want to trip and that will terrify some people so much that they'll just want to be on their Lexa Pro or or a non psychedelic psychedelic or whatever.
And of course, you should be allowed to have those options, of course, and the more options, the better.
But I think there is great value in really understanding what psychedelic therapy is.
And I think when you do, you realize that it is a major paradigm challenge on many levels.
And the fact that it's different might be its greatest appeal at the moment, I think.
Well, I am certainly grateful for your passion for the potential for psychedelics to be added to the array of potential treatments.
And I really also appreciate how much you put it in there alongside the other treatments, maybe even in combination with other treatments as opposed to saying this is the thing that's going to cure everything.
And yet the passion that you have for this potential paradigm shift, the one that really appears to be happening at the level of clinical data now.
Is so important.
So I want to extend a voice of gratitude for that and for the work that you're doing.
I mean, I've been outside of this field, but as a neuroscientist, I've been paying careful attention to it really for the last five, seven years or so.
And it's abundantly clear that it is a small group of individuals who are really thinking in terms of how the system works now and what needs to be done in order to change the system for the better.
Like yourself that are really the driving force behind this new movement or paradigm shift that without question is going to lead to improvements in mental health and physical health outcomes.
So I just want to say thank you for that.
Also, thank you so much for joining us today to share this immense knowledge set about the history of psychedelics, what they are, what they aren't their clinical applications as seen in your laboratory and other laboratories.
I'm sure people already noticed this, but you're incredibly generous in terms of attribution and and also in your caution about explaining how some of the results in particular on anorexia fibromyalgia are perhaps preliminary but very exciting.
They're not published yet anyway, we wouldn't call them preliminary.
And also for touching on mechanism that is not just about people feel better but pointed to some potential underlying mechanisms in terms of connectivity changes and on and on.
So thank you so much for your time today.
Thank you for the work that you're doing.
And thank you for the work that is sure to continue.
We will provide links to studies in your laboratory links to your laboratory so people can learn more and support in the ways that they deem appropriate for them.
But just thank you.
Thank you.
Thank you.
Such important work you're doing Robin.

Thank you, Andrew.
It's been a pleasure.
Thank you for joining me today for my discussion with Dr. Robin Carhart Harris.
I hope you found it to be as informative about the science and clinical uses of psychedelics as I did.
If you'd like to learn more about Dr. Carhart Harris's research or support that research or inquire into being a research subject in one of his laboratory studies, please see the links in the show note captions.
In addition, please see the links to his Twitter account and other social media accounts also in the show note captions.
Also in the show note captions, you'll find a link to Dr. Carhart Harris's Twitter account where he regularly posts about new advances in the field of psychedelic science.
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I do read all the comments.
Not so much on today's episode, but on many previous episodes of the Huberman Lab podcast.
We discussed supplements while supplements aren't necessary for everybody.
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And we do not share your email with anybody.
Thank you once again for joining me for today's discussion with Dr. Robin Carthart-Harris.
And last but certainly not least, thank you for your interest in science.