

The Neuroscience of Psychedelic Healing: How to get psychedelic therapy without anyone going to jail!

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A large, multi-armed cholla cactus (Cylindropuntia) dominates the frame, its numerous green, ribbed arms radiating from a central trunk. The arms are densely covered with small, dark, circular areoles and fine, light-colored spines. The cactus is set against a clear, bright blue sky. To the left, a smaller, single-stemmed cholla cactus is partially visible. The overall scene is brightly lit, suggesting a sunny day.

Section 1:
Why are we talking about this?

**What if it were possible to cut rates of mental illness
in half in 10 years?**

What if healing begins with an updated understanding of trauma?



A lush, moss-covered waterfall in a dense jungle. The scene is filled with vibrant green foliage, including ferns and various plants. The waterfall is the central focus, cascading over mossy rocks. The lighting is soft and natural, highlighting the textures of the moss and the surrounding vegetation. The overall atmosphere is serene and natural.

Many Indigenous & Eastern Medicine practices believe that the root cause of mental illness is unhealed trauma.

U.S. Burnout by the Numbers

120,000

Stress-attributed deaths each year caused by burnout

\$63.2B

Average cost of lost productivity to U.S. business due to chronic stress at work

\$190B

U.S healthcare expenses from burnout

11.3 days

Average productivity loss for workers due to chronic stress at work

Sources • Stanford University Graduate School of Business,
American Academy of Sleep Medicine 2018

Tim's body thinks his computer is a bear

Our bodies are not designed for chronic daily stress.

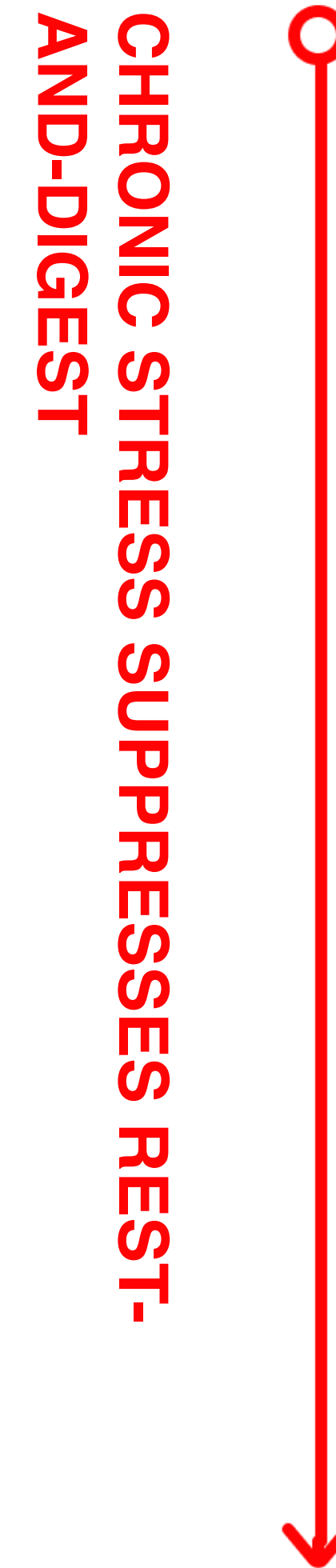
It over-activates the brain's fear center (amygdala) and disrupts activity in the emotional cortex (limbic system).

The result? Tim can't sleep or focus well, his mood suffers, and his heart rate variability (HRV) drops.



**SYMPATHETIC
(FIGHT-OR-FLIGHT)**

Chronic stress trains the nervous system to be in fight-or-flight mode and suppresses your rest-and-digest nervous system, making us wired, tired, and unable to focus.



**Overactive
Fight-or-Flight**
→

-  Loss of emotion control
-  Poor sleep
-  Can't focus
-  Low HRV
-  Increased BP and HR

**PARASYMPATHETIC
(REST-AND-DIGEST)**

- Biofeedback
- **Deep breathing**
- **Meditation/Mindfulness**
- Float Tanks (sensory deprivation)
- **Yoga** (movement meditation)
- **Soothing Touch** (Massage)
- **Sound/Music**
- Vagal Nerve Stimulation
- **Empathic Listening**
- Apollo Neuro/Vibration

**Rest-and-Digest
Restored**



In control of emotions



Improved sleep



Better focus



Improved HRV



Decreased BP and HR

**SYMPATHETIC
(FIGHT-OR-FLIGHT)**

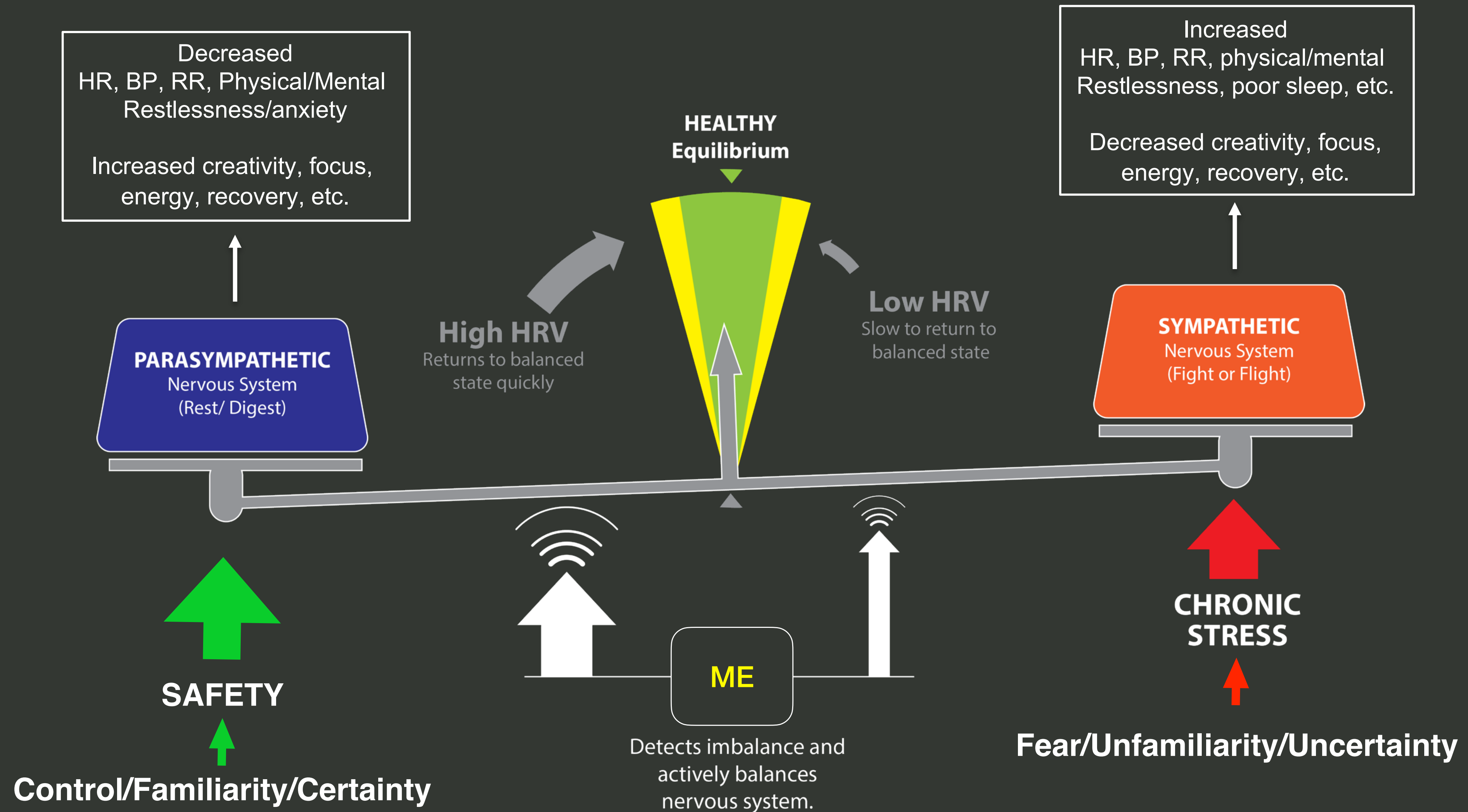
**IMPROVED PARASYMPATHETIC TONE
WITH APOLLO USE**



**PARASYMPATHETIC
(REST-AND-DIGEST)**

Lehrer & Gevierts, 2014; Craig, 2009; Strigo & Craig, 2016

The delicate balance of the autonomic nervous system (ANS)



Big Tech



Heart Rate Variability (HRV)

HRV is the most reliable easy measurement of our recovery level AND the impact of trauma/stress on our bodies.





Traumatic experiences are intense, meaningful, challenging experiences over time, where we perceived ourselves to be **THREATENED...**

for which we did **NOT have adequate preparation or support** after to cope successfully.

Results in a more 'negative' reference toward self and the world resulting in decreased vagal/parasympathetic activity

Healing experiences are intense, meaningful, challenging experiences over time, where we perceived ourselves to be **SAFE...**

for which we **did have adequate preparation or adequate support** after to cope successfully.

Results in a more 'positive' reference toward self and the world resulting in increased vagal/parasympathetic activity



What can we learn from studies of psychedelic medicines?



What does 'Psychedelic' mean?

- **'Psyche' = Mind**
- **'Delos' = To show**
- **'Psychedelic' = To show or reveal the mind or 'mind-manifesting'**
 - **To expand our awareness to include that which is typically beneath our awareness**
 - **Psychedelic substances are molecular 'non-specific amplifiers' to awareness**

To access psychedelics states, no drugs are required!

Clinical Psilocybin

Reduced symptoms of depression
Improved coping with
end of life distress

Improved sense of **safety**

Improved feelings of connection
to self and others

Rated as one of the most
meaningful experiences ever

With just 1 dose &
psychotherapy

Currently in FDA Phase 2 trials

Clinical MDMA

>60% of patients with PTSD no longer met diagnostic
criteria after 12 months


Improved sense of **safety**

Improved feelings of connection
to self and others

Rated as one of the most
meaningful experiences ever

With just 1-3 doses &
12 weeks of psychotherapy

Currently in FDA Phase 3 trials

A cluster of small, light-colored mushrooms with smooth caps and thin stems, growing on a thick bed of green moss. The background is a soft-focus forest scene with green foliage and a hint of a stream or path. The lighting is natural, highlighting the texture of the mushrooms and the moss.

Psychedelic medicines have shown greater promise to safely treat disorders of trauma than any other medicines EVER studied.

Many Indigenous cultures have been using psychedelic medicines to address trauma for millennia...



**How do psychedelic states work
to improve learning?**

What is Neuroplasticity?

—
Neuroplasticity = **Learning**
—

Learning is the neural process of growing and training networks of neurons in the brain in 3 primary ways:

Neurogenesis – Making new neurons

Neuroregeneration – Recovering old neurons

Synaptogenesis – Making new connections



Neurocatalytic

- **Increase brain functioning**
- **Enhance learning**
- **Provide perspective**
- **Expand awareness**

The 7 Most Important Neurocatalytic Techniques

1. Intentional breathing
2. meditation/mindfulness
3. Soothing touch
4. Movement
5. Music and intentional listening
6. Nutrition
7. Sleep



Psychedelic Substances are neurocatalytic

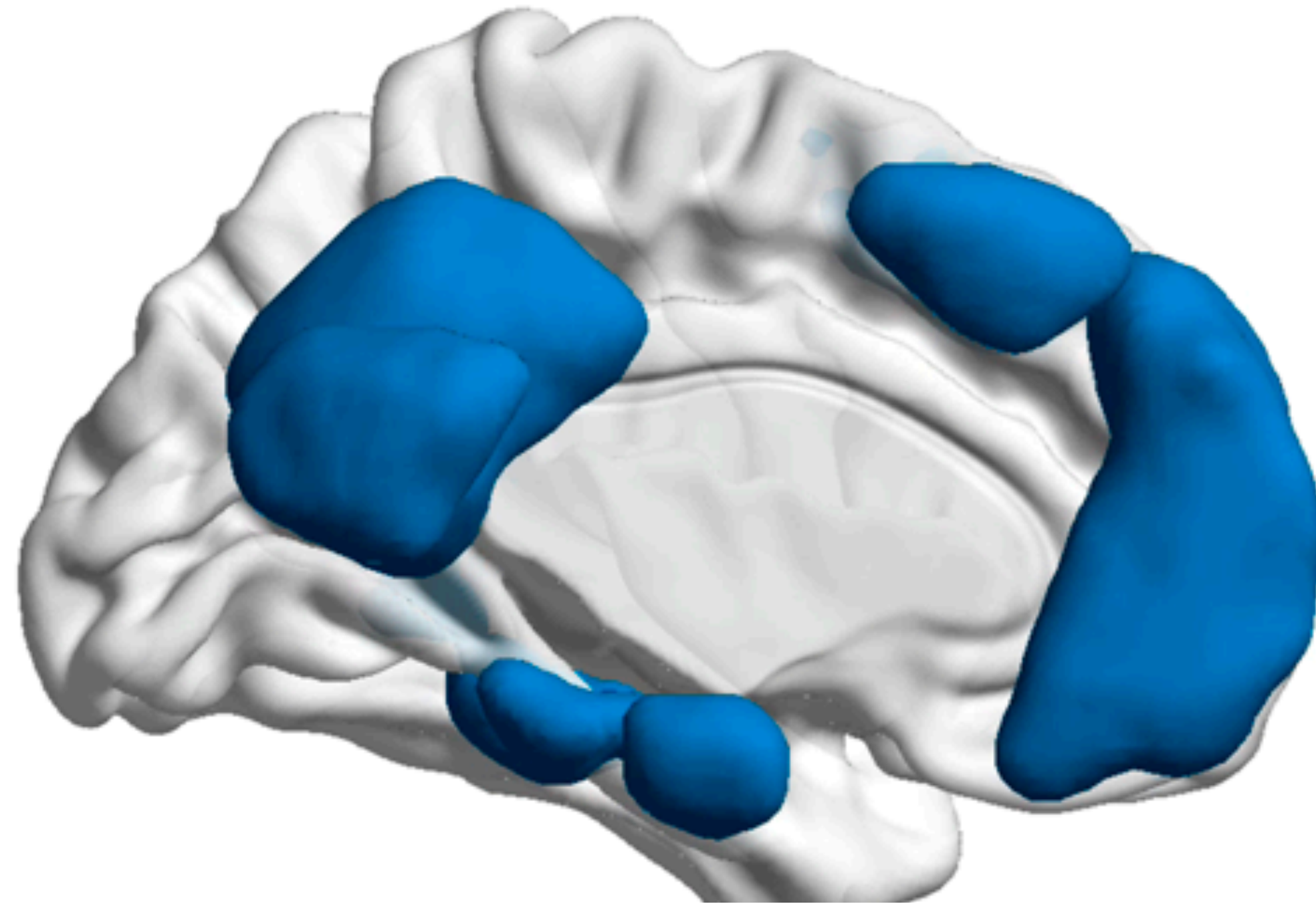
Mind-revealing; molecular non-specific amplifiers of awareness and neuroplasticity.

- Cannabinoids
- Ketamine
- Phenethylamines (ie. MDMA/mescaline)
- Tryptamines (Psilocybin, LSD, DMT, Ayahuasca)

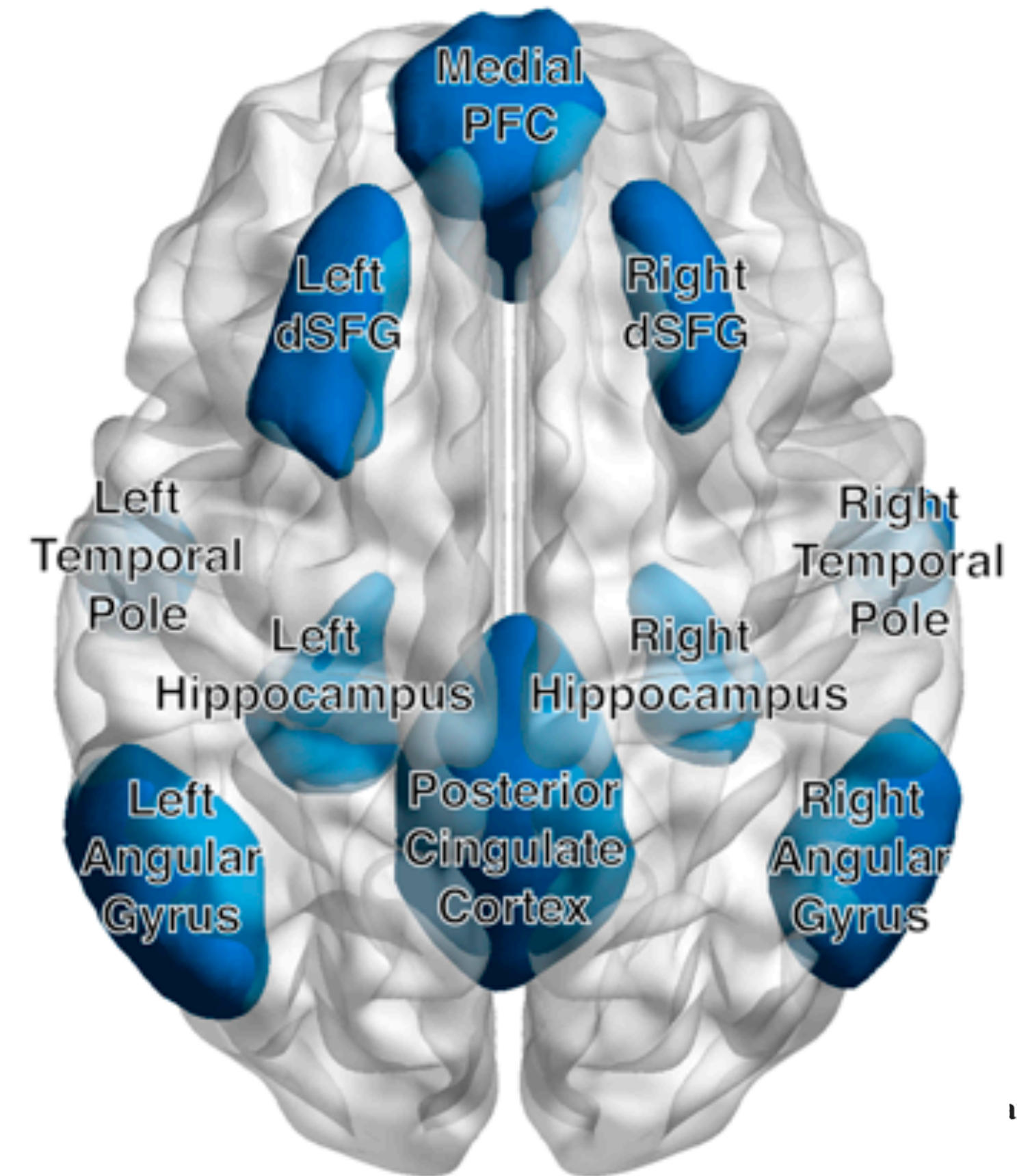
The Default Mode Network (DMN)

McCormick & Telzer, 2018

A.



B.



ORIGINAL RESEARCH article

Front. Hum. Neurosci., 14 June 2016 | <https://doi.org/10.3389/fnhum.2016.00269>



in Mapping 36:3137–3153 (2015) ◆

Ego-Dissolution and Psychedelics: Validation of the Ego-Dissolution Inventory (EDI)

 Matthew M. Nour^{1,2*},  Lisa Evans³,  David Nutt³ and  Robin L. Carhart-Harris³

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²Institute of Psychiatry Psychology and Neuroscience, King's College London, London, UK

³Faculty of Medicine, Centre for Neuropsychopharmacology, Division of Brain Sciences, Imperial College London, London, UK

Finding the Self by Losing the Self: Neural Correlates of Ego-Dissolution Under Psilocybin

Alexander V. Lebedev,^{1,2*} Martin Lövdén,¹ Gidon Rosenthal,³ Amanda Feilding,⁴ David J. Nutt,⁵ and Robin L. Carhart-Harris⁵

The Default Mode Network (DMN) and Ego

The DMN is a signature of perception from one point of view:

- The ego (at rest)

The entrainment of the DMN occurs to automate patterns important for survival.

The DMN keeps us within the realm of what we know.



Psychedelic medicines, meditative states, and other altered state experiences reduce typical DMN connectivity, attenuate ego, and leave us with infinite possibilities.

Practice makes mastery.

The more we practice thinking, perceiving, or doing anything, the better we get at it.

This occurs because our neurons make new proteins that increase the strength and efficiency of neural connections.

These evolutionarily conserved mechanisms of learning date back >300M years.



Psychedelic substances must be used **highly intentionally** and carefully as they are non-specific amplifiers of awareness.

They amplify **ALL** parts of awareness and **can enhance unintentional learning of undesirable practices or information.**



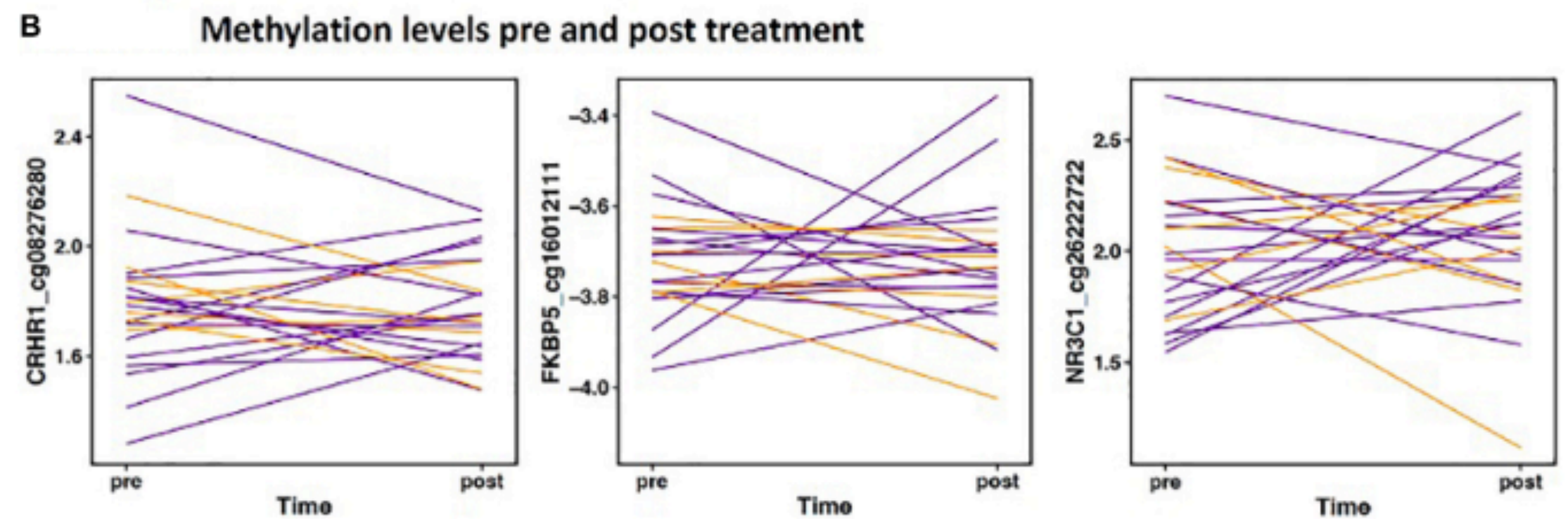
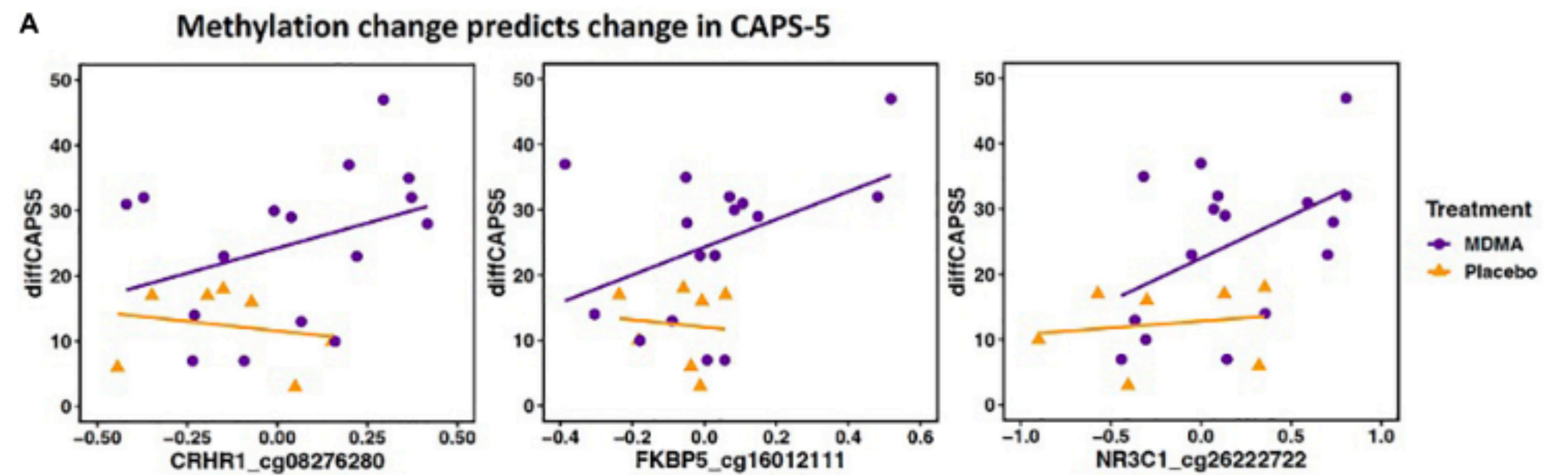
Danger warning: When misused and abused can increase risk of psychosis and bipolar disorder.

The future of mental health involves unlocking the mechanisms of psychedelic medicines so that we can maximize access to care by:

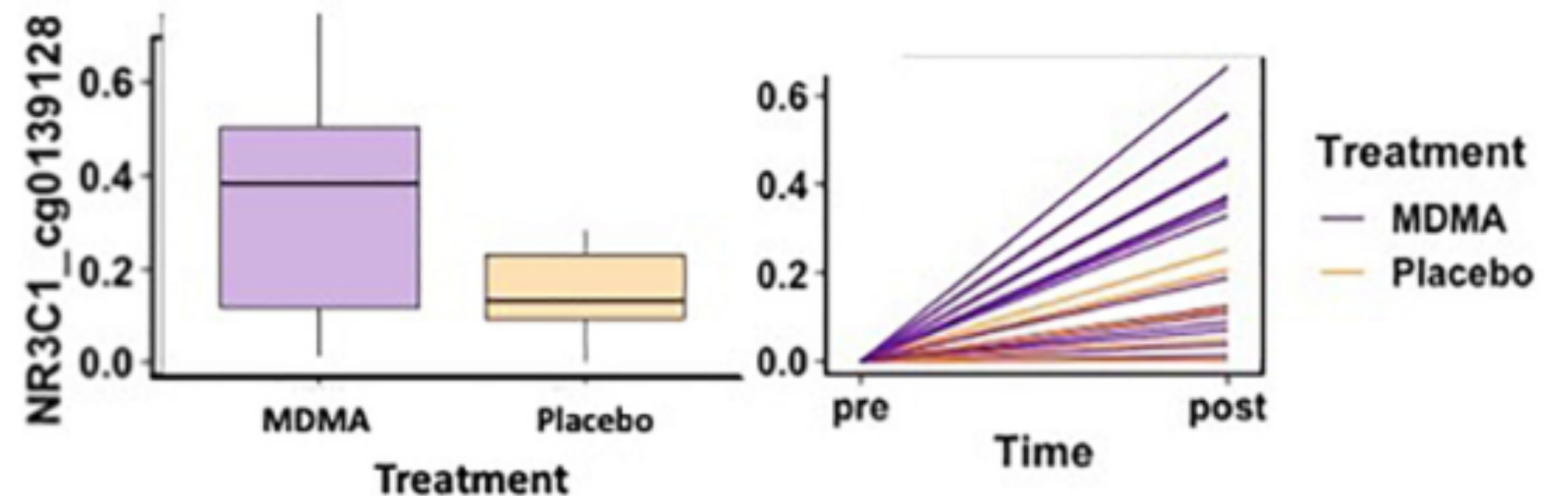
- 1) Replicating the beneficial effects with **technology** for those who aren't good drug candidates
- 2) Developing more objective biomarkers for predicting treatment responses and enhancing outcomes

Pilot study suggests DNA methylation of the glucocorticoid receptor gene (NR3C1) is associated with MDMA-assisted therapy treatment response for severe PTSD

Candace R. Lewis^{1,2*}, Joseph Tafur³, Sophie Spencer¹, Joseph M. Green¹, Charlotte Harrison⁴, Benjamin Kelmendi⁵, David M. Rabin⁶, Rachel Yehuda^{7,8}, Berra Yazar-Klosinski⁴ and Baruch Rael Cahn^{9,10*}



Absolute change in DNA methylation on NR3C1_cg01391283.





U.S. Department
of Veterans Affairs



**Apollo Neuro is collaborating with
The Board of Medicine and The
Denver VA to compare the
epigenetic impact of the Apollo
wearable and MDMA-assisted
therapy in PTSD.**

Apollo calms you through
your body's natural
response to touch.





The Apollo wearable is the first patented wearable technology to help people navigate challenging experiences associated with psychedelic medicines.

Born in the lab, Apollo is backed by clinical and real-world research.

Originally developed from research in The Department of Psychiatry at the University of Pittsburgh Medical Center, Apollo is backed by 13 clinical trials, with 14 more underway.

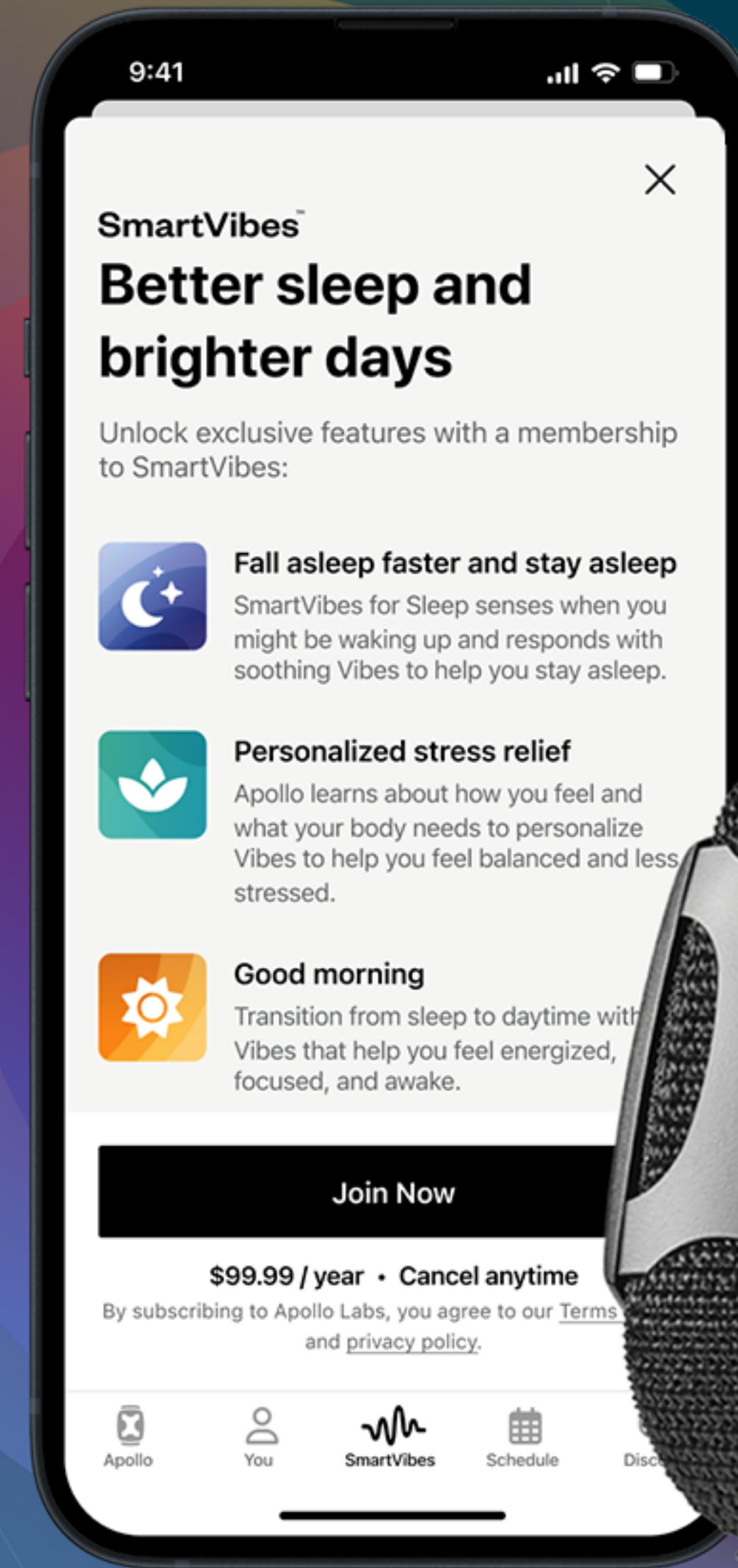


Apollo Neuro is running clinical trials in collaboration with The Board of Medicine and MAPS to evaluate if use of the Apollo wearable can improve outcomes in psychedelic-assisted therapy.



Premium subscription SmartVibes™ unlocks Apollo's predictive & generative AI.

- Launched in November 2023.
- **The first product to predict and prevent unwanted middle-of-the-night wakeups before they happen.**
- Generates Vibes automatically throughout the day and night to help you bounce back from stress.



AND THE #1
NEUROSCIENCE TAKE
AWAY IS.....

**SAFETY
IS REQUIRED TO MAKE
MEANINGFUL LIFE
CHANGES THAT STICK.**

Resources

1. **Psychedelic.Support**
2. **Ketamine Psychotherapy
Associates**
3. **MAPS.org**

**YOU ARE
WORTHY
OF LOVE**





Try Apollo on your iPhone now:



Thank you! www.DrDave.io

www.theboardofmedicine.org  APOLLO