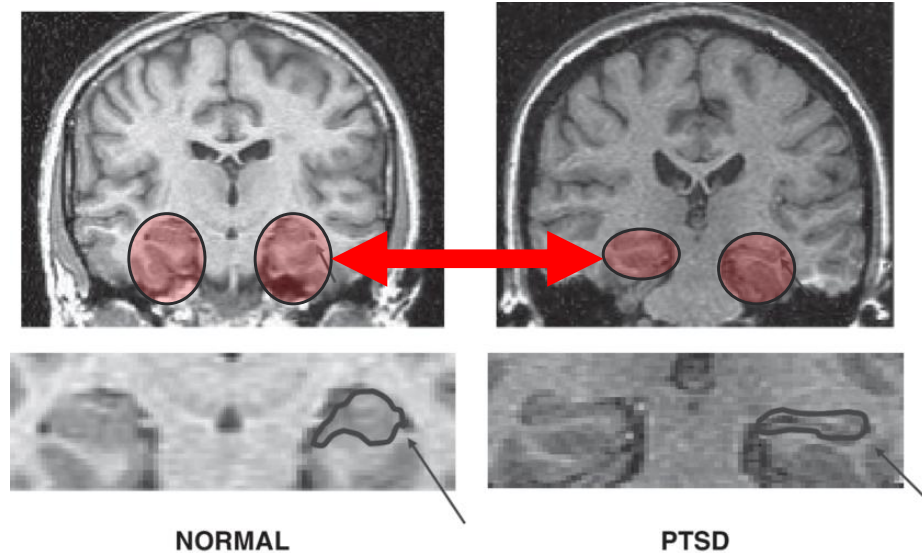




How the Brain Rebuilds



Reversible Changes in the Hippocampus



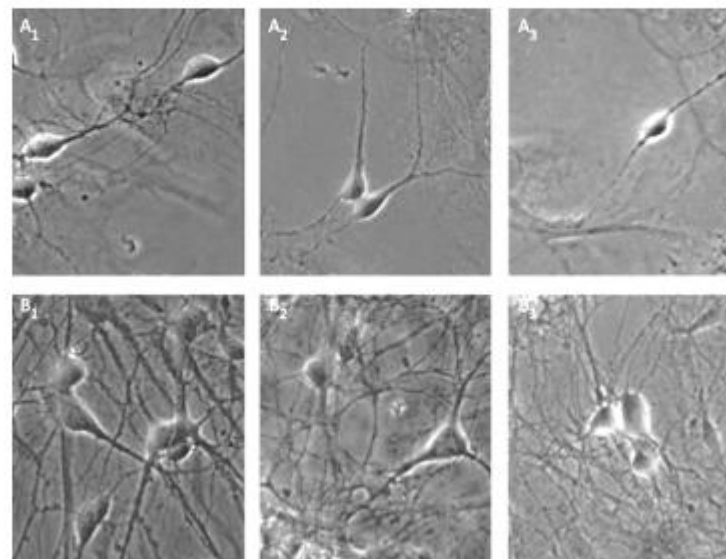
PTSD, TBI, Sleep Deprivation, Major Depressive Episodes





The protein BDNF is measurable during growth

It works like this; when you're depressed, avoiding social contact or overwhelmed with trauma and grief for a period of a few months or more, your brain chemistry changes. As Brain-Derived Neurotrophic Factor (BDNF) decreases, so too do neurons and connections between surviving neurons in your brain. See the graph below to get a visual of the top three rows of a mouse brain without BDNF and the bottom three rows with plenty of BDNF.



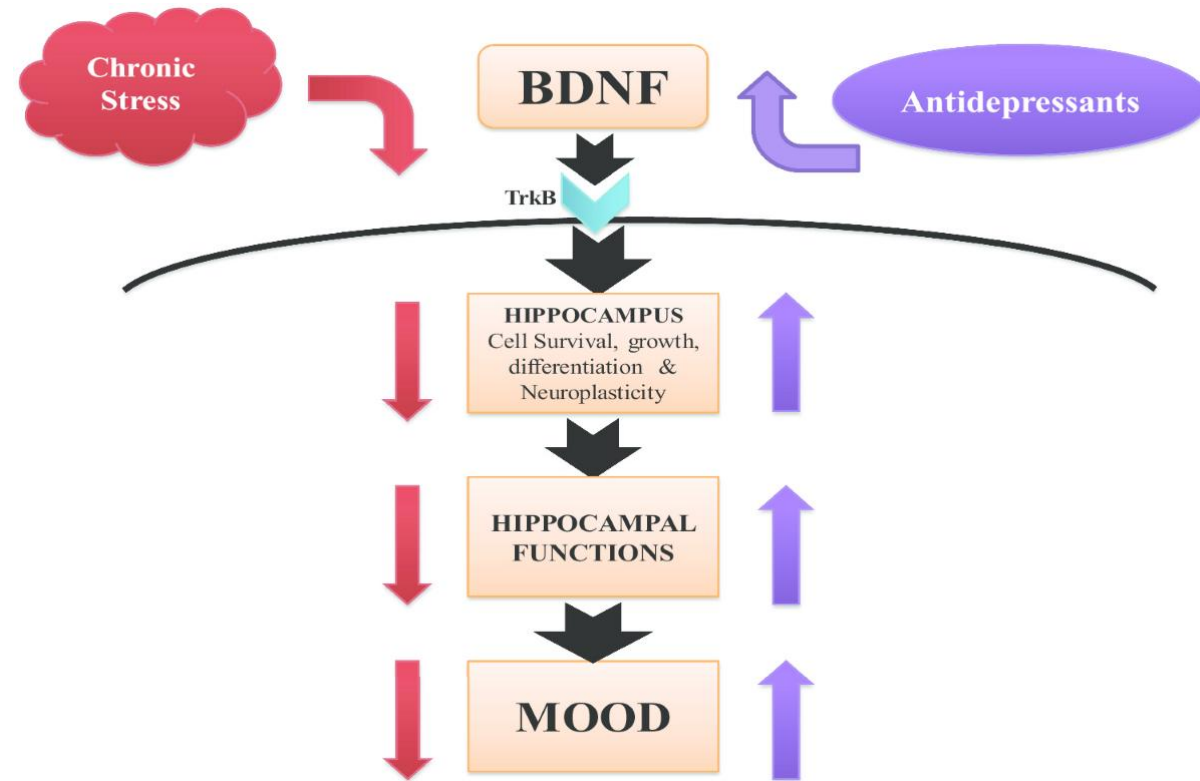
Excerpt from my first book, [Combat PTSD in America: Toward a Permanent Solution](#) (2016)



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Brain-Derived Neurotrophic Factor



<https://link.springer.com/article/10.1007/s12031-020-01754-x>





How to Increase BDNF

- Meditation
- Weight lifting
- Eating more fruit in the diet
- Socialization and support
- Cognitive-Behavioral Therapy
- SSRI Antidepressants

Excerpt from my first book, [Combat PTSD in America: Toward a Permanent Solution](#) (2016). A Mindshift if the permanent solution.

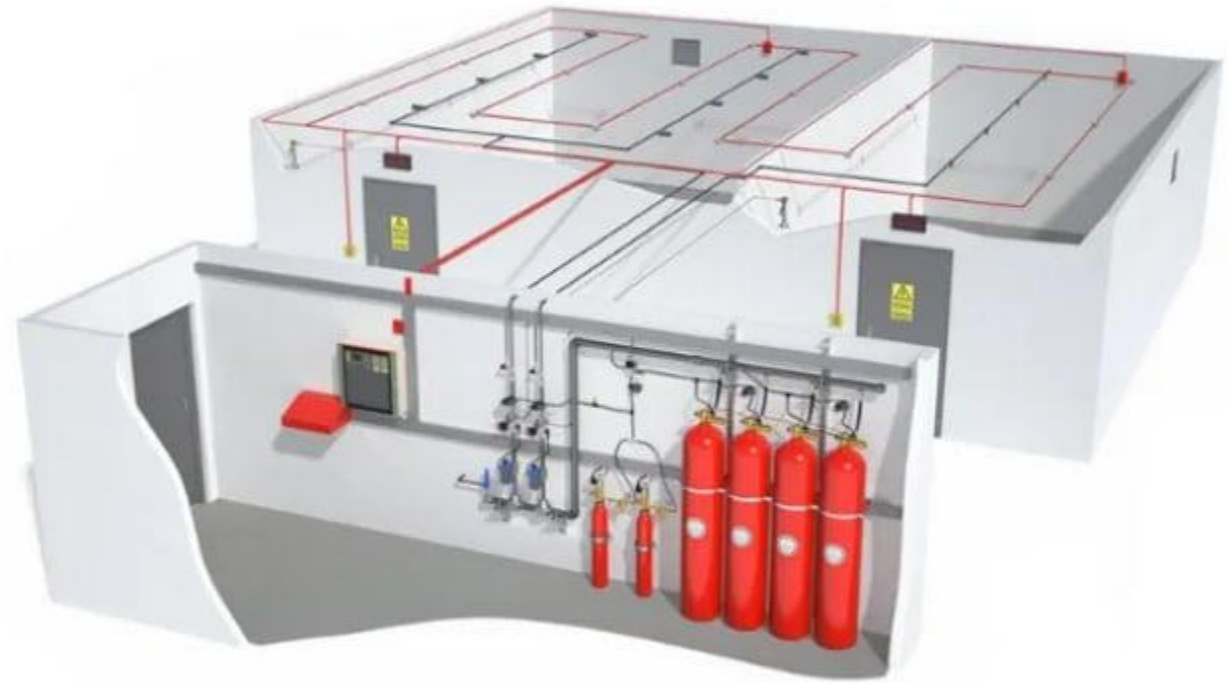


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The Governor of Homeostasis?



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The Governor of Homeostasis?

What is the best kept secret in all of medicine?



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The Governor of Homeostasis

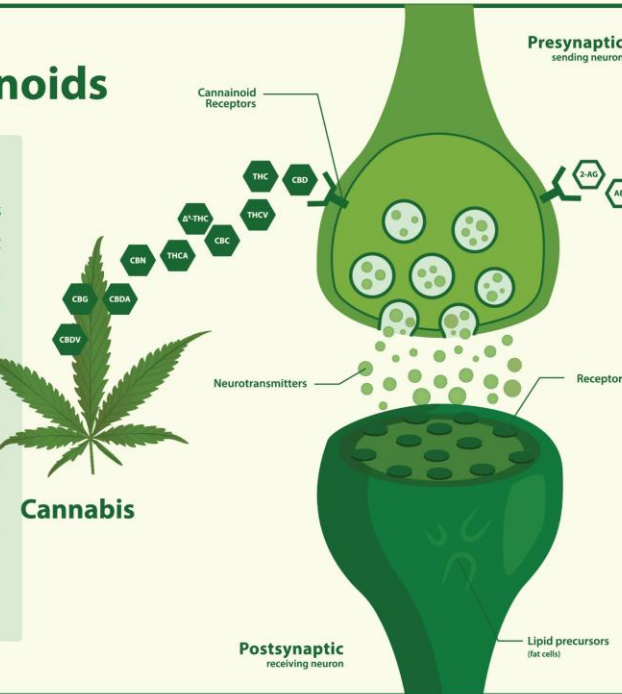
PHYTOCANNABINOIDS vs ENDOCANNABINOIDS

PHYTOCANNABINOIDS ARE NATURALLY-OCCURRING AND CONCENTRATED IN THE OIL RESIN OF THE CANNABIS LEAVES AND BUDS. WHEREAS, ENDOCANNABINOIDS ARE CANNABINOIDS THAT OUR BODIES PRODUCE INTERNALLY.

Phytocannabinoids

The cannabis plant and other plants produce cannabinoids, which interact with our body's receptors. These plant cannabinoids are known as phyto-cannabinoids. Phyto is a prefix that means "pertaining to derived from plants". They are categorized as any plant-derived natural product with the capability to directly interact with the body's cannabinoid receptors or share chemical similarity with cannabinoids.

Cannabis



Endocannabinoids

The endocannabinoid system (ECS) is a biological system composed of endocannabinoids, which are endogenous lipid-based retrograde neurotransmitters that bind to cannabinoid receptors, and cannabinoid receptor proteins that are expressed throughout the vertebrate central nervous system (including the brain) and peripheral nervous system. The endocannabinoid system remains under preliminary research, but may be involved in regulating physiological, appetite, pain-sensation, and in mediating the pharmacological effects of cannabis.

Human



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Dr. Ethan Russo

Cannabis and Cannabinoid Research
Volume 1.1, 2016
DOI: 10.1089/can.2016.0009

**Cannabis and
Cannabinoid Research**

Mary Ann Liebert, Inc. publishers

REVIEW

Open Access

**Clinical Endocannabinoid Deficiency Reconsidered:
Current Research Supports the Theory in Migraine,
Fibromyalgia, Irritable Bowel, and Other
Treatment-Resistant Syndromes**

Ethan B. Russo*

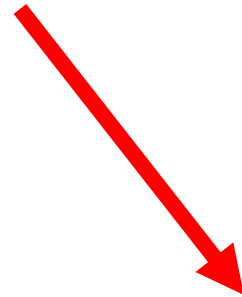


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How the Brain Rebuilds





Brain-Derived Neurotrophic Factor

J Neurophysiol 104: 1923–1932, 2010.
First published August 18, 2010; doi:10.1152/jn.00472.2010.

BDNF Evokes Release of Endogenous Cannabinoids at Layer 2/3 Inhibitory Synapses in the Neocortex

Fouad Lemtiri-Chlieh and Eric S. Levine

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Received 26 May 2010; accepted in final form 12 August 2010

Lemtiri-Chlieh F, Levine ES. BDNF evokes release of endogenous cannabinoids at layer 2/3 inhibitory synapses in the neocortex. *J Neurophysiol* 104: 1923–1932, 2010. First published August 18, 2010; doi:10.1152/jn.00472.2010. The neurotrophin brain-derived neurotrophic factor (BDNF) is a potent regulator of inhibitory synaptic transmission, although the locus of this effect and the underlying mechanisms are controversial. We explored a potential interaction between BDNF and endogenous cannabinoid (endocannabinoid) signaling because activation of type 1 cannabinoid (CB1) receptors

highest levels in the neocortex and hippocampus (Masana et al. 1993). Within the neocortex, trkB is predominantly localized to layers 2/3 and 5 (Cabelli et al. 1996; Fryer et al. 1996; Miller and Pitts 2000). At the subcellular level, trkB and p75 are expressed in postsynaptic dendrites and axon terminals (Aoki et al. 2000; Gomes et al. 2006), in glutamatergic neurons (Cabelli et al. 1996), and in GABAergic neurons (Drake et al. 1999).

BDNF is a potent modulator of GABAergic transmission

<https://journals.physiology.org/doi/full/10.1152/jn.00472.2010>



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Brain-Derived Neurotrophic Factor

- “...results suggest that BDNF induces the release of a retrograde messenger from the postsynaptic cell that regulates presynaptic neurotransmitter release.
- Consistent with a role for endocannabinoids as the retrograde signal, the effect of BDNF on IPSCs was blocked by CB1 receptor antagonists and was occluded by a cannabinoid receptor agonist.
- Furthermore, inhibiting endocannabinoid synthesis or transport also disrupted the BDNF effect, implicating postsynaptic endocannabinoid release triggered by BDNF.”

<https://journals.physiology.org/doi/full/10.1152/jn.00472.2010>



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Upcoming

- January 2026, Basic Training with NLHT1.com
- Episode 22: GeoEngineering Watch
- Episode 23: The Endocannabinoid System
- Episode 24: Safe Medical Cannabis



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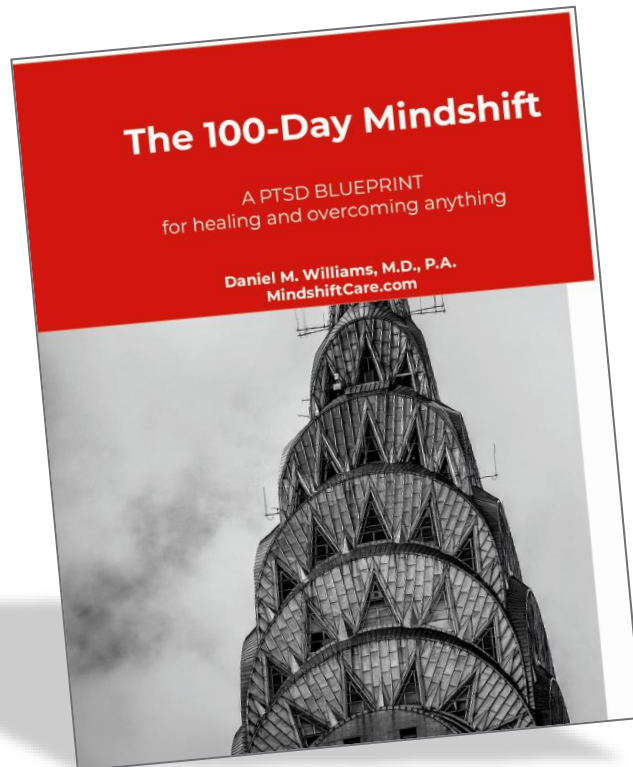
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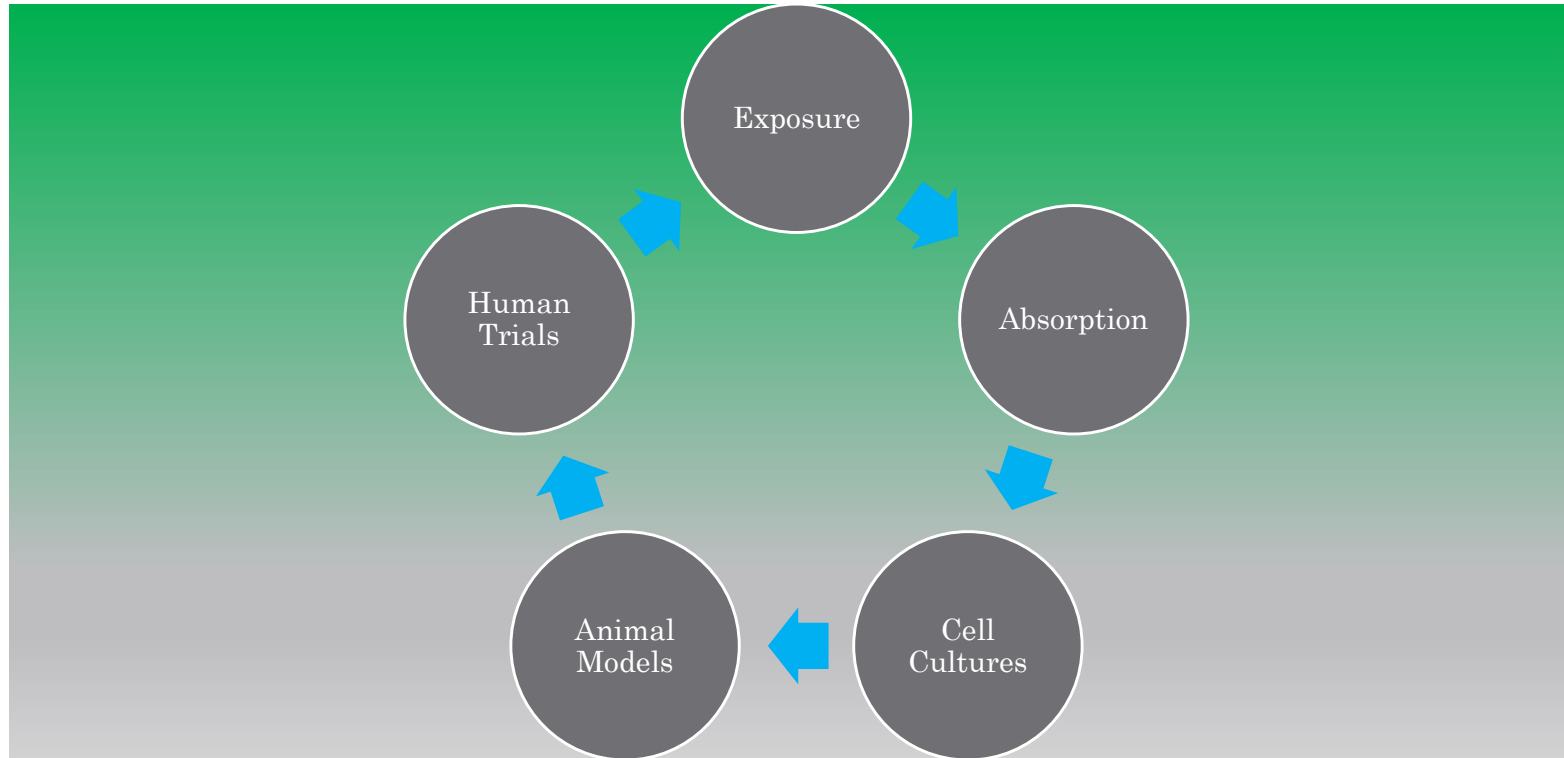


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Independent Medical Opinions

- Disability applications
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“A friend loveth at all times;
And a brother is born for adversity.”
Proverbs 17:17 ASV

Daniel M. Williams
MD, PA

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Founder, [MindshiftCare.com](https://www.MindshiftCare.com)



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