Digital Neurotherapy from C8 Sciences: Executive Summary

Science
- Our brains work through neural systems that integrate millions of neurons across the brain
- Clinical diseases results from disruption of the systems supporting cognition & emotion

Product
- Digital Neurotherapy (DNT) Apps that restore neurosystem function—entirely new class of Rx
- NIH Director’s Award for “high innovation, high impact, paradigm-changing medical research”

Unmet Need
- Depression, age-related cognitive decline and dementia are the #1 health burdens in human and financial costs WORLDWIDE.
- Current treatments do not align with brain organization: limited efficacy & high side effects

Market Opportunity
- Multibillion dollar markets
- Platform technology that can address a dozen CNS disorders

Team
- World leading neuroscientists and computer scientists
- Leading international computer game company
- Fortune 500 C-Level leadership
Depression – A Large Unmet Medical Need with Huge Cost Burden and Medication Treatments with Low-Effect

Largest Cause of W/W Disability

- 16M US depression patients
- >200M World-wide
- $210B US economic burden
- 7.6% US workplace prevalence
- Average healthcare claim cost for MDD patients $11k vs. $5K for non-MDD

Current Rx’s Largely Inadequate

- 60% of cases untreated
- 30%-50% non-responder rate
- Symptoms “reduced” but most not “remitted”
- >50% of 1st episodes relapse
- Cognitive disorders not treated
- Multiple side effects
NO NEW IDEAS, NO NEW DRUGS, NO NEW HOPE
“There are very few new molecular entities, very few novel ideas, and almost nothing that gives any hope for a transformation in the treatment of mental illness.” Tom Insel, former Director, NIMH

Of candidate new drugs, each developed in pre-clinical animal studies at a cost of $500M, 93% fail human clinical trials. Of those that are approved, nearly all are only partially effective and have problematic side-effects.

DRUGS ARE DEVELOPED IN MICE WHO DO NOT HAVE THE FUNCTIONAL SYSTEMS THAT CHARACTERIZE THE HUMAN BRAIN
In the context of huge investment in new drug development, Joshua Gordon, the current Director of the NIH asked “what about the prefrontal cortex, a complex amalgam of regions in humans that clearly plays a crucial role in psychiatric dysfunction, yet is ridiculously simplified and comparatively miniscule in mice?”

All AVAILABLE BRAIN TREATMENTS LACK SPECIFICITY
He commented on: “the lack of specificity in available somatic treatments, be they drugs that bind widely distributed targets or stimulation-based therapies that at best target large swaths of brain tissue,” and referred to “pie-in-the-sky dreams” of being able to manipulate neural systems with higher specificity.
Depression is a neurosystems disorder

Connectivity loss & activation imbalances drive both mood symptoms and Rx non-response


C8’s DNT Platform and Apps Harnesses Neuroplasticity to Restore Neurosystem Function

- Brain’s functional neurosystems are shaped after birth by stimulation from the environment
- DNT uses the same sensory and neuroplastic processes that shaped the neurosystems to repair them
- Highly targeted brain training exercises presented as computer games
- Just as direct a physical brain intervention as drugs, TMS or tCDCS, but much more precise
2X More Effective than Competitors in Treating Depression and ADHD

“ Easily the most sophisticated brain training program ever conceived”
- NIH Director’s Award

C8 Sciences vs Click Therapeutics

Response Rate in Depression

C8 Sciences

Click Therapeutics

38% 40% 90% 72%

C8 Study 1 N=51
Click Study 2 N=20
C8 Study 1 N=44
Click Study 2 N=36

Iacoviello et al *npj Dig Med* 2018 & Martin et al *J Aff Dis* 2018

C8 Sciences vs Akili Interactive

Response Rate in ADHD

C8 Sciences

41% 24%

C8 Sciences N=66
Akili N=179

Wexler et al *Psychol Med* 2020
Kollins et al *Lancet Dig Med* 2020

Curious why C8’s DNT is the best? Let’s talk...
Pathway to Profit

FDA Approval as Medical Device
Strategic Partnership with Pharma or Insurance Company

Blavatnik Development Funds Requested For:

Pre-submission (presub) to FDA to obtain FDA feedback and concurrence on a clinical study design and plan to submit a 510(k) using the Somyrst as a predicate.
Time: 3-6 months  Costs: Writer, statistician, regulatory consultant, FDA mtg = $160K

Preparation of software documentation as per FDA requirements for 510(k) submissions as detailed in “Guidance for the Content of Premarket Submissions for Software Contained in Medical Devices.”
Time: 12 months Costs: software analyst/writer and regulatory consultant = $140K
World Class Team and Partners

Dr. Bruce Wexler, Yale School of Medicine, Founder

Dr. Morris Bell, Yale School of Medicine, Cognitive Assessments

Donna-Bea Tillman, Biologics Consulting, CDER, Apple, Microsoft

Andre Levchenko, Ph.D., Director, Yale Systems Biology Institute/AI

Ilya Nemenman, Ph.D., Emory Univ., Biological Information Processing/AI

Global video game developers

WilmerHale, Legal, Apple, Novartis, Thermo Fisher

Technical Resources International, Clinical Research Organization

BLJ Worldwide, PR and Marketing

Amazon Web Services, IT infrastructure

Tim Kish, CEO, VP/CFO Biogen, VP/CFO Illumina, Venture Capital
YES – WE HAVE PICTURES SHOWING WE RESTORE BRAIN FUNCTION!