



# Cohen Veterans Bioscience

## Cohen Veterans Bioscience Fact Sheet

### Q. What is Cohen Veterans Bioscience and what are its goals?

Cohen Veterans Bioscience is the only non-profit research organization with a singular focus on post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI) research.

Cohen Veterans Bioscience funds basic, translational, and clinical research with the goal of fast-tracking the development of diagnostic tests and personalized medicines for the millions of veterans and civilians who suffer the devastating effects of trauma on the brain. Our efforts are heavily focused on studies and projects that culminate in essential research tools and data that can drive development forward.

### Q: Why is an organization such as Cohen Veterans Bioscience needed?

Millions of American veterans and civilians are experiencing the devastating effects of trauma on the brain. With 20 veterans committing suicide every day, PTSD and TBI have reached epidemic proportions. Those suffering desperately need relief.

Trauma, whether physical or emotional, rewires the brain. We now have the opportunity to map those changes in breathtaking detail by harnessing recent advances in neuroscience, genetics, computing, and other fields. Work being done in labs around the world has the potential to yield great benefits for patients—but only if it can be scaled up and assembled to solve a complex scientific puzzle.

Cohen Veterans Bioscience exists to energize that process. We serve as a research incubator, bringing together the brightest minds and deploying the most innovative scientific tools with an emphasis on scale, risk-minimization, efficiency, and speed. We allow researchers to focus on science and ensure that their work produces meaningful returns for patients — new knowledge, new tests, and new treatments.

We believe that it is within our reach to prevent people from developing PTSD after an event, to attack the effects of trauma at their molecular roots, and to personalize therapy. Our mission is to ensure that no one who experiences trauma suffers the effects for a lifetime.

### Q. What is Cohen Veterans Bioscience's vision?

Our vision is built around three strategic pillars: diagnostics, translational tools, and therapeutics and care:

- **Diagnostics** to discover biomarkers and develop a commercializable path for PTSD and TBI diagnostics.
- **Translational Tools** to bridge the gap between scientific research and application in the clinical setting using new technology and industrialized standards.
- **Therapeutics and Care** to encourage investment in a pipeline of therapeutics and improve care delivery through evidence-based practices.

## Q. What are the key milestones that Cohen Veterans Bioscience is trying to achieve?

We believe that progress can be made not in decades but within the next few years. Our milestones are:

- To bring the first diagnostics for PTSD or TBI to market within 3 years.
- To make pre-clinical animal models, biomarker and clinical data, disease models, and other essential research tools freely available to academic researchers to accelerate progress.
- To discover the first genome-wide significant risk allele association for PTSD within 1 year.
- To build a wearables and mobile health platform for monitoring brain health in the next 2 years.

## Q. What types of research does Cohen Veterans Bioscience support?

Cohen Veterans Bioscience operates as a Public-Private Partnership Cooperative Alliance, organizing and funding a network of partners who each contribute complementary and synergistic data, capabilities, or expertise to support a common roadmap for identifying diagnostic biomarkers, building predictive brain disease models, developing robust standardized translational tools, and catalyzing pharmaceutical drug development. The emphasis is on team science with Cohen Veterans Bioscience serving as its hub.

Cohen Veterans Bioscience-supported researchers are using brain imaging, genetic, metabolic and other blood tests, eye tracking, voice biomarkers, and other methods to determine the variations among veterans with and without PTSD and TBI.

Cohen Veterans Bioscience has collaborative partnerships with:

- **The Stanley Center for Psychiatric Research at the Broad Institute of MIT and Harvard** to conduct the largest study of genetic biomarkers for PTSD.
- **NYU Langone Medical Center and Stanford University** on a five-year study of veterans that seeks to discover and develop a panel of biomarkers to classify an individual as having PTSD and/or TBI.
- **McLean Hospital** to establish a “brain bank” to focus on both PTSD and TBI in military and civilian populations.
- **Exaptive and Fraunhofer Institute for Algorithms and Scientific Computing** to create a PTSD KnowledgeMap™, which will extract information from the published literature to build disease models. This is based on Biological Expression Language (BEL), which contains the core mechanisms of PTSD and TBI as well as a terminology for PTSD and TBI.
- **Columbia University** to support a preclinical PTSD model program that will study the interplay between genes and the environment as one cause of PTSD. An already identified gene, TIA-1, has been found to offer protective benefits but is altered when exposed to environmental stress. Further research will look at ways to maintain the gene’s protective features, which could ultimately lead to the development of drugs to prevent and treat PTSD.
- **Early Signal Foundation** on a mobile health program that will continuously capture and integrate data that people are generating through the use of wearable devices. Monitoring of this data in real time can help generate a “personalized health blueprint” that will accurately detect PTSD triggers and assess progression, effectiveness of treatment, and long-term recovery.
- **Clinical Data Interchange Standards Consortium (CDISC)** - to develop global data standards for PTSD. The collaboration with Cohen Veterans Bioscience will map the most common biomedical concepts used in PTSD by collecting and synchronizing data with the ultimate goal of establishing uniform standards to help improve the interoperability of PTSD medical research and clinical care.

- **American College of Radiology Head Injury Institute** – to perform standardized MRI scans on 3,000 adult volunteers, collect demographic information and perform neurocognitive assessments. This data will form the basis for a library documenting population variation in brain structure as measured by state-of-the-art neuroimaging. Standards developed by the project for performing imaging and assessing volunteers will also be made available to the research community, so that future efforts can both add to the library and use it as a resource in the study of people with TBI.

### **Q. Will this research only focus on veterans?**

This research will benefit anyone experiencing, or at risk for, PTSD and TBI. In the U.S., approximately 8 million adults—both military and civilian populations—will experience PTSD in a given year, according to the U.S. Department of Veterans Affairs’ National Center for PTSD. About 1.7 million people sustain a TBI annually, according to the U.S. Centers for Disease Control and Prevention (CDC). Traumatic brain injury is a contributing factor to one-third of all injury-related deaths in the U.S. So any brain research on these two conditions will benefit everyone.

### **Q. What is the purpose of setting up a “brain bank” to study PTSD and TBI?**

The Cohen Veterans Bioscience Post-Traumatic Stress Disorder and Traumatic Brain Injury Brain & Tissue Collection is the first brain and tissue bank to focus on both PTSD and TBI. It will be a very important resource for the research community that will help accelerate understanding of these diseases and identify cures. The public can help with these efforts by donating their brains to support this important research. More information can be found at [cohenbraincollection.org](http://cohenbraincollection.org).

These efforts will provide critical research tools for understanding the underlying neurobiology and genetics of PTSD and TBI.

### **Q. What causes PTSD?**

PTSD is a psychological response to a traumatic event, such as combat, sexual assault, natural disaster, and acts of terrorism. Not everyone who experiences a traumatic event will develop PTSD as everyone reacts to situations in their own way. Research will determine why this is so.

### **Q. Are some people at higher risk for developing PTSD?**

We believe so. We know that exposure to a traumatic event causes underlying changes in the brain that may make some people less resilient and more hypervigilant in response to stress and thus more vulnerable to PTSD. Our research will try to gain a better understanding about why this occurs.

### **Q. How can genetics research better determine PTSD risk factors?**

Our research will look at, among other things, genetic influences at play. Genetic factors are critical in influencing who develops PTSD. Heritability estimates for the disorder are as high as 70% following trauma.

Unlike some other neuropsychiatric diseases, such as autism, we do not yet know how genetic variants affect a person’s risk for developing PTSD. The data we glean from our research can help discover a mechanism to more reliably predict the risk of PTSD in different populations and afford an opportunity for preventive interventions.

## Q. How are PTSD and TBI currently treated?

There are no definitive diagnostic tests for PTSD, which can guide appropriate treatment, and no FDA-approved therapeutic for PTSD in 15 years. The only approved medications for the treatment of PTSD are the selective serotonin reuptake inhibitors (SSRIs) sertraline (Zoloft®) and paroxetine (Paxil®) but these medications have variable efficacy results and in some studies have not demonstrated superiority over placebo in managing the core symptom clusters of PTSD, particularly in complex PTSD.

Although a medical exam is the first step in diagnosing potential head injury, it can be difficult to officially diagnose TBI. Universally accepted “gold standard” diagnostic standards have not yet been established, though the CDC, the American College of Rehabilitation Medicine, and some others have published guidelines for diagnosing TBI.

In 2016, the FDA cleared two diagnostic devices to assess cognitive function following a suspected TBI. More sensitive and objective diagnostic methods to detect TBI are needed.

## Q. What is traumatic brain injury? What is considered a traumatic brain injury?

A traumatic brain injury is a sudden trauma to the brain. It can occur when the head hits a hard object or when something pierces the skull and damages brain tissue. TBIs are categorized as mild, moderate, or severe. Sustained traumas to the head can progress to severe TBIs over time.

Most people experiencing a mild TBI won't suffer any long-term problems though they may experience headache, fatigue, fuzziness, confusion, dizziness, or forgetfulness in the immediate aftermath. These symptoms typically occur within the first seven to 10 days and go away within three months. Post-concussion syndrome is the persistence of a constellation of physical, cognitive, emotional, and sleep symptoms beyond the usual recovery period after a concussion and is usually treated based on the specific symptoms experienced.

Like with PTSD, in some cases, evaluating whether a person has suffered a traumatic brain injury, such as a concussion, is not an exact science. Sometimes abnormalities cannot be determined during a neurologic examination. This is where eye tracking and voice biomarkers can be a tremendous help in identifying abnormalities not caught during traditional examinations.

Traumatic brain injury and PTSD often go hand in hand because physical changes in the brain can cause emotional effects.

## Q. How are Cohen Veterans Network and Cohen Veterans Bioscience related?

Cohen Veterans Network, launched in April 2016, focuses on the clinical side of PTSD by providing free mental health care to veterans and their families—regardless of discharge status—throughout the United States.

Cohen Veterans Bioscience, established in 2014, focuses on the science behind PTSD and TBI. Both organizations complement the work of the other. Research will lead to discoveries that will inform clinical care. What we learn in the clinical care setting will help inform research. One drives the other.

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