



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.

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.

Cohen Veterans Bioscience is an independent, non-profit 501(c)(3) research organization supported, in part, by philanthropist Steven A. Cohen and other generous funders.

Post-Traumatic Stress Disorder and Traumatic Brain Injury 2016 Facts and Figures

Post-Traumatic Stress Disorder

What is Post-Traumatic Stress Disorder?

- Post-traumatic stress disorder (PTSD) is a mental health condition that some people develop after experiencing or witnessing a violent or life-threatening event, such as combat, natural disaster, terrorist attack, or sexual assault.
- Symptoms of PTSD can include reliving the event or having flashbacks; avoiding situations that trigger the memories; losing interest in activities or feelings of fear, guilt, or shame; feeling anxious or always on alert for danger. Sufferers may have trouble concentrating or sleeping—a state called hyper-arousal. Other symptoms include panic attacks, depression, suicidal thoughts, feeling estranged and isolated, and not being able to complete daily tasks. [U.S. Centers for Disease Control and Prevention (CDC) 2016]

How Prevalent is PTSD?

- Approximately 7 or 8 out of every 100 people will experience PTSD at some point during their lives. About 8 million adults have PTSD in a given year. [U.S. Department of Veterans Affairs National Center for PTSD 2016]
- Women are more than twice as likely to develop PTSD as men (10% of women vs. 4% of men). [U.S. Department of Veterans Affairs National Center for PTSD 2016]

How Does PTSD Affect Veterans?

- According to data recently released by the Department of Veterans Affairs, 20 veterans are committing suicide every day.
- Nearly 19 percent of returning service members from the wars in Iraq and Afghanistan met criteria for either PTSD or depression. This means that approximately 300,000 veterans who have returned from Iraq and Afghanistan are currently suffering from PTSD or major depression. [RAND 2008]
- And it is not just veterans of recent wars who are suffering. A study published in JAMA Psychiatry [2015] found that 40 years after the Vietnam War ended, about 271,000 veterans who served in the war zone still suffer from some form of post-traumatic stress disorder and more than one-third have current major depressive disorder.
- Other factors in combat can add to stress and contribute to PTSD and other mental health problems, including the veteran's role in the war, politics surrounding the war, where it was fought, and the type of enemy the service members faced.
- Sexual trauma and harassment can also contribute to PTSD. Among veterans who used VA healthcare, 23% of women reported sexual assault when they were in the military. About 55% of women and 38% of men said that they had experienced sexual harassment when in the military. [U.S. Department of Veterans Affairs National Center for PTSD 2016]

What Treatment is Available for PTSD?

- There are no definitive diagnostic tests for PTSD and there has been 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.

Traumatic Brain Injury

What is a Traumatic Brain Injury?

- A traumatic brain injury, or TBI, is caused by a blow or jolt to the head or penetrating head injury that disrupts normal function of the brain. [BrainLine.org]
- TBIs can range from mild, with a brief change in mental status or consciousness (commonly called concussions), to severe, with an extended period of unconsciousness or memory loss.
- In the military, it is often called the signature wound of the wars in Iraq and Afghanistan. The most common cause of TBIs in those who served has been from Improvised Explosive Devices. [Military.com 2016]

How Prevalent Are They?

- TBIs contribute to about 30% of all injury deaths. More than 50,000 Americans died as a result of a TBI in 2010.
- About 5.3 million Americans live with a long-term disability due to a TBI.

[Sources for prevalence: CDC]

How do TBIs Affect Veterans?

- From 2000 to the first quarter of 2016, nearly 348,000 service members have suffered a TBI, 82% of which were mild. [Federal Defense and Veterans Brain Injury Center 2016]
- 19% of troops reported a probable TBI during deployment. Those with a severe injury could cost up to \$408,520 per case. [RAND 2008]
- Service members with a mild TBI were more than two times more likely to be discharged for misuse of alcohol/drugs or criminal convictions and those with moderate TBI were about five times more likely to be discharged for alcohol/drug problems. [RAND 2008]
- Seven percent of veterans suffer from both PTSD and TBI. [RAND 2008]

What Treatment is Available for TBI?

- 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.
- 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.

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Cohen Veterans Bioscience

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ORION BIONETWORKS TO BECOME COHEN VETERANS BIOSCIENCE

Will Join Forces with Steven A. Cohen to Establish Non-profit Global Research Alliance for Post-Traumatic Stress and Traumatic Brain Injury Research

NEW YORK, November 12, 2015 – Orion Bionetworks will become Cohen Veterans Bioscience, a non-profit organization that will focus research on Post-Traumatic Stress (PTS) and Traumatic Brain Injury (TBI) to improve diagnoses and treatment of veterans. The announcement was made today by Dr. Magali Haas, President and CEO of Cohen Veterans Bioscience and Steven A. Cohen, Chairman and CEO of Point72 Asset Management.

“Our veterans have come back from Iraq and Afghanistan facing PTS and TBI and we owe it to them to find better diagnostic tools and treatments,” Mr. Cohen says. “PTS is often misdiagnosed or undiagnosed and our service members don’t receive effective treatment as a result.”

The goal of Cohen Veterans Bioscience is to speed the discovery of first generation diagnostics, treatments, and cures for PTS and TBI by improving the scientific understanding of the basic biological mechanisms that set the stage for these conditions.

“Breakthroughs don’t come from one person – they come from many people. Collaboration is key,” says Dr. Haas. “Cohen Veterans Bioscience will bring people together and that will have a compounding effect on the knowledge we now have and give us deeper insights, broader understanding, and better science to translate into the best treatments for patients.”

Cohen Veterans Bioscience will also harness the power of high-performance computing and data analytics to discover and develop predictive disease models from integrated biomarker, biosensor, and phenotypic data. The hope is that, in the next three years, there will be a first generation of diagnostics for PTS and TBI.

“Once we have a better understanding of the science of PTS and TBI, we can advance a new pipeline of therapeutics and improve the delivery of medical care,” says Dr. Haas.

Cohen Veterans Bioscience plans to fund \$30 million or more in research programs over the next five years, including its established partnerships with New York University and Columbia University, and new public-private partnerships it expects to foster.

“We have moved from funding research by others to creating primary research efforts of our own,” says Mr. Cohen.

This is the latest endeavor supported by Steven Cohen to address the needs of our nation’s veterans. He co-chaired, along with the former Chairman of the Joint Chiefs of Staff Admiral Mike Mullen, the Robin Hood Foundation’s Veterans Advisory Board where he helped create a program designed to aid the growing number of veterans, reservists, national guardsmen, and their families living in poverty in New York City.

In a Washington Post op-ed piece, they described the challenge:

“Many vets never get the treatment they need — and the families who suffer alongside them, and whose support is essential to successful treatment, are ineligible for care from the Department of Veterans Affairs.”

In 2013, the Steven & Alexandra Cohen Foundation gave the largest individual single private gift in the nation—\$17 million—to establish the Steven and Alexandra Cohen Veterans Center for the Study of Post-Traumatic Stress and Traumatic Brain Injury at NYU Langone Medical Center. Mr. Cohen has since augmented that amount to found the Steven and Alexandra Cohen Military Family Clinic at NYU Langone.

Magali Haas, MD, PhD, founded Orion Bionetworks in July 2012 and served as its CEO and President. She has more than 15 years of pharmaceutical executive and clinical research experience, predominantly at Johnson & Johnson, where she assumed broad end-to-end development leadership roles in medical marketing, full clinical development, early development, and translational and biomarker sciences in psychiatry and neurology. She launched Orion Bionetworks to accelerate the discovery of next-generation diagnostics, treatments, and cures for brain disorders.

Since September 11, 2001, more than 2.5 million American service members have been deployed to Iraq and Afghanistan, and many others have been posted in a number of other dangerous regions around the world. According to a RAND Corporation study, nearly 19 percent of returning service members met criteria for either PTSD or depression and nearly 20 percent reported experiencing a probable TBI during deployment. Seven percent of veterans suffer from both PTSD and TBI.

And it is not just veterans of recent wars who are suffering. A study published this summer in JAMA Psychiatry found that 40 years after the Vietnam War ended, about 271,000 veterans who served in the war zone still suffer from some form of post-traumatic stress disorder and more than one-third have current major depressive disorder.

“I’m proud of what we’ve done to address the mental health needs of our veterans. But we haven’t done nearly enough,” says Mr. Cohen. “With Dr. Haas’ leadership, Cohen Veterans Bioscience will advance the science and availability of new medical treatments and we will be able to help more veterans tomorrow than we did yesterday.”

Cohen Veterans Bioscience is the only 501(c)3 non-profit research organization with a singular focus on PTSD and TBI research. We are dedicated to 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.

More information is available at www.cohenveteransbioscience.org.

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Cohen Veterans Bioscience

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Cohen Veterans Bioscience Partners With the Broad Institute's Stanley Center for Psychiatric Research to Launch the Largest Study of Genetic Markers for Post-Traumatic Stress Disorder

Separate Partnership with McLean Hospital Will Create the First Brain Bank to Study Both Post-Traumatic Stress Disorder and Traumatic Brain Injury in Veteran and Civilian Populations

NEW YORK, January 27, 2016—Cohen Veterans Bioscience today announced two new collaborative partnership efforts that will provide critical research tools for understanding the underlying neurobiology and genetics of post-traumatic stress disorder (PTSD) and traumatic brain injury (TBI) with the goal of accelerating the development of first generation diagnostics and treatments.

For the partnership with the Stanley Center for Psychiatric Research at the Broad Institute of MIT and Harvard, Cohen Veterans Bioscience will contribute funding to support both genotyping of DNA samples to expand knowledge about the genetic influences associated with PTSD and access to extensive genetics expertise available at the Broad Institute. The initiative will include the creation of a PTSD genetics database devoted exclusively to the analysis of tens of thousands of DNA samples collected from more than 30 global research centers. The collaborations share a goal of discovering the first genome wide association for PTSD within a year.

"We look forward to working in partnership with Cohen Veterans Bioscience, leveraging our technologies and the insights of our genomics experts to advance understanding of PTSD, and our ability to diagnose and ultimately treat this debilitating disorder," said Steven Hyman, Director of the Stanley Center for Psychiatric Disease Research at the Broad Institute.

Post-traumatic stress is the most commonly occurring and seriously impairing disorder that occurs after exposure to traumatic events, such as combat, sexual assault, and natural disaster. Among the military, nearly 20 percent of enlisted soldiers—approximately 300,000—who returned from Iraq and Afghanistan have reported symptoms of post-traumatic stress or major depression, according to the RAND Corporation.

"Genetic factors are critical in influencing who develops PTSD," says Magali Haas, MD, PhD, CEO & President of Cohen Veterans Bioscience. "Unlike some other neuro-psychiatric diseases, we do not yet know how genetic variants affect a person's risk for developing PTSD. These data can provide a mechanism to more reliably predict the risk of PTSD in different populations and afford an opportunity for preventive interventions. We are proud to partner with a world-leading genetics research institution like the Broad Institute's Stanley Center to advance the science of PTSD."

In another joint venture, Cohen Veterans Bioscience will partner with McLean Hospital, a Harvard Medical School affiliate, to establish the Cohen Veterans Bioscience Post-Traumatic Stress Disorder and Traumatic Brain Injury Brain & Tissue Collection. The first brain and tissue bank to focus on both PTSD and TBI, this special collection will be maintained at McLean's Harvard Brain Tissue Resource Center, a national resource for the acquisition, processing, storage, and distribution of postmortem brain tissue to the scientific community, for the purpose of conducting research on the brain.

“This collection is an extraordinary exciting development that will help fill a critical need for the research community worldwide,” explains Kerry J. Ressler, MD, PhD, Chief Scientific Officer for McLean Hospital and one of the country’s leading researchers on trauma. “Thanks to this new resource, we will be able to study the brains of a diverse population—both military and civilians—who have experienced PTSD and/or TBI in their lifetime with the ultimate goal of identifying better, more effective methods of treating each of these disorders.”

According to Ressler, he and his collaborators have a goal of collecting at least 100 brains from affected individuals and will coordinate closely with the recently launched Leahy-Friedman National PTSD Brain Bank to maximize use of these limited resources.

Traumatic brain injuries have become the signature wound of the wars in Iraq and Afghanistan with approximately 20 percent of veterans having reported experiencing a TBI. It is also quite prevalent in the civilian population. Each year at least 2.2 million people suffer from a traumatic brain injury in the United States. Of those, 50,000 die and 280,000 require hospital admission, according to the U.S. Centers for Disease Control.

The Cohen Bioscience Special Collection will be available to qualified industry and academic center researchers to conduct independent PTSD and TBI research.

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More information is available at www.cohenveteransbioscience.org.

McLean Hospital

McLean Hospital is the largest psychiatric affiliate of Harvard Medical School and a member of Partners HealthCare. In addition to providing a full continuum of psychiatric clinical care, McLean maintains the largest neuroscience and psychiatry research program of any private psychiatric hospital in the United States. McLean’s robust research program is backed by more than \$40 million in funding from a variety of sources, including foundations, private contributors, National Institute of Health, United States Department of Defense, and Defense Advanced Research Projects Agency. For more information about McLean, visit mcleanhospital.org or follow the hospital on Facebook or Twitter.



Cohen Veterans Bioscience

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Creation of PTSD Knowledge Map Will Chart a New Course for Global Research Efforts

Cohen Veterans Bioscience, Exaptive and Fraunhofer SCAI Collaboration Seeks to Close the Knowledge Gap on PTSD

CAMBRIDGE, Mass., February 11, 2016 – Cohen Veterans Bioscience, Exaptive Inc. and Fraunhofer Institute for Algorithms and Scientific Computing (SCAI) today announced a new initiative to improve access to post-traumatic stress disorder (PTSD) research. The creation of a PTSD KnowledgeMap™ will systematize the current PTSD research space and provide interactive tools for scientists and others studying PTSD.

In the U.S. alone, approximately 8 million adults—both civilian and military populations—will experience PTSD in a given year, according to the U.S. Department of Veterans Affairs' National Center for PTSD. According to a 2013 World Health Organization report, an estimated 3.6% of the world's population had suffered from PTSD in the previous year.

Post-traumatic stress puts a significant strain on families, employers and civilian and military healthcare systems. Despite a number of groups actively investigating PTSD, there is currently no easy way for researchers, policymakers and others to know what areas of study are most active, who is working on what, and where funding is or should be going. In fact, in the past 35 years, more than 100,000 peer-reviewed scientific articles have been published on PTSD. This important body of work forms the basis for many ongoing and future investigations.

The PTSD KnowledgeMap™ will bring together research on clinical symptoms, biomarkers, genetic variation, epidemiological studies and many other factors deemed relevant for PTSD. It will include easy-to-use interactive visualizations for people to search vast data in an accessible manner. The partnership will also establish an ongoing process for incorporating new research as it becomes available.

"There has been and will continue to be a wealth of PTSD studies conducted around the globe yet there is no main repository to catalogue the valuable findings that will result," says Magali Haas, MD, PhD, CEO & President of Cohen Veterans Bioscience, the lead funder of the initiative. "Many research endeavors overlap. Our goal is to centralize information and produce a blueprint for global PTSD research. This partnership will harness the novel computational information retrieval system developed by Fraunhofer SCAI and the innovative analytics conceived by Exaptive to create a new data mining tool."

"Despite popular opinion, just amassing data will not by itself lead to insight," says Dave King, Founder and CEO of Exaptive. "Without the ability to quickly and easily navigate data, the information remains largely unusable. We are excited to be working with Cohen Veterans Bioscience and Fraunhofer SCAI to help bring this data to life for such an important area of study."

Adds Martin Hofmann-Apitius, PhD, Head of the Department of Bioinformatics at Fraunhofer Institute for Algorithms and Scientific Computing, "The consortium brings together world-class expertise in the area of PTSD and computational neurology, the competency for visualization of complex processes and relationships and the expertise in the area of information retrieval and disease modeling. While it is extremely challenging to model something complex like PTSD, we are optimistic that together with Cohen Veterans Bioscience and Exaptive we can fully represent the state of knowledge in the clinical and molecular context."

The new interactive tool for exploring PTSD research will be made available later this year. The computable model and the software environment supporting exploration and mining of the knowledge map will be shared with researchers worldwide in order to foster rapid uptake of computational systems biology approaches in translational PTSD research.

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Exaptive

Exaptive is a software company whose mission is to lower the barriers to analyzing and collaborating with data. The Exaptive platform enables software developers and researchers to interchange and experiment easily with different analytics tools, suggests relevant techniques users haven't tried yet, and connects users to others working on related projects. The goal is to reveal new approaches and make it easy to try them, so that gaining new insight happens faster and big breakthroughs are more frequent. Users can also leverage others' work or monetize their own work as a part of a combinatorial marketplace. More information is available at www.exaptive.com.

Fraunhofer Institute for Algorithms and Scientific Computing

The Fraunhofer Institute for Algorithms and Scientific Computing conducts research in the field of computer simulations for product and process development, and is a prominent corporate partner in the industrial and science sectors. SCAI designs and optimizes industrial applications, implements custom solutions for production and logistics, and offers calculations on high-performance computers. Its services are based on industrial engineering, combined with state-of-the-art methods from applied mathematics and information technology. The team of Martin Hofmann-Apitius has used their knowledge extraction capabilities to successfully generate a large research model of Alzheimer's Disease. More information is available at www.scai.fraunhofer.de/bio.

MilitaryTimes

Tests, treatments for brain injury and PTSD to be focus of new nonprofit

By: Patricia Kime, November 12, 2015

A new nonprofit organization is seeking to cut the time it takes for brain injury and post-traumatic stress research to transform into treatments for those life-altering conditions.

Cohen Veterans Bioscience, with offices in New York and Cambridge, Massachusetts, hopes to facilitate development and production of diagnostic tests for traumatic brain injury and PTS as well as treatments and cures.

About 1.7 million Americans experience head injuries each year in the U.S., according to the Centers for Disease Control and Prevention.

Such injuries are not uncommon in the military; 327,299 troops were diagnosed with a TBI from 2000 to March 2015.

Additionally, more than 138,000 active-duty members who deployed in support of combat operations were diagnosed with PTSD from 2001 to 2015, according to the Congressional Research Service.

Cohen Veterans Bioscience wants to “improve the scientific understanding of the basic biological mechanisms” of head injury and PTS, said president and CEO Dr. Magali Haas.

“Despite significant investment by the National Institutes of Health and the Defense Department in basic science, there is still a huge unmet need for these individuals,” Haas said. “There are only two approved medications for PTS and nothing for TBI. The fact that this gap exists despite these investments indicates that more work needs to be done.”

In 2013, the White House announced an ambitious plan to map the brain, with the Defense Advanced Research Projects Agency receiving \$100 million to aid the effort and determine how individual brain cells and neural circuits work and function together.

Haas said this research, as well as other projects by academia, government agencies and private corporations, have led to surprising breakthroughs and understanding.

But she added that much more must be done, and her organization will focus primarily on “translational research” — efforts designed to shorten the gap between scientific discovery and treatment.

“It’s basically accelerating time,” she said of her group’s mission.

Cohen Veterans Bioscience was made possible by Steven Cohen, chairman and CEO of Point72 Asset Management. He is a philanthropist who has financed other veterans mental health programs, including the Steven and Alexandra Cohen Veterans Center for the Study of Post-Traumatic Stress and Traumatic Brain Injury at NYU Langone Medical Center and the Cohen Military Family Clinic at NYU Langone.

“Our veterans have come back from Iraq and Afghanistan facing PTS and TBI, and we owe it to them to find better diagnostic tools and treatments,” Cohen said. “PTS is often misdiagnosed or undiagnosed, and our service members don’t receive effective treatment as a result.”

Haas said Cohen Veterans Bioscience has immediate plans to fund \$30 million in research programs over the next five years and has established partnerships with NYU and Columbia University.

In addition to focusing on translational research, the organization also plans to use big data to develop models for who might be susceptible to PTSD, concussion or more severe brain injury.

Haas says she hopes to shorten the development for diagnostics and treatments from the average 11 to 13 years to five years, and, for a diagnostic test, perhaps as little as three years.

"It is sometimes disheartening to hear it's going to be another three, five, 10 years until we have that first-generation diagnostic test, but I think it's actually going to be sooner than that because the investments are right," Haas said.

"There are so many new things we are learning about brain health — about exercise, nutrition, cognitive games — that are helpful for these conditions, and I think people should be thinking very positively about the potential in the near future for treatment."

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HEROIC
HONORABLE
DEDICATED
DUTY
SERVICE
BRAVE
READY
COMMITMENT
COURAGEOUS
SELFLESS
INTEGRITY
VALIANT
MISSION
PATRIOTIC
RESPECT
ALWAYS
COUNTRY
SEMPER
DEFEND

Cohen Veterans Bioscience

Board of Directors

Magali Haas, MD, PhD, MSE CEO & President, Board Chair



Dr. Haas founded Cohen Veterans Bioscience and currently serves as CEO, President and Chair of the Board. She brings over 15 years of pharmaceutical executive and clinical research experience, predominantly at Johnson & Johnson, to the role. As an “intrapreneur” at J&J she established the first Neuroscience Translational Medicine & Integrative Solutions department, and co-founded the first Companion Diagnostics Center of Excellence as well as J&J’s Healthcare Innovation team. She was the founding Chief Science and Technology Officer for One Mind for Research, a nonprofit organization launched in May 2012 by Patrick J Kennedy. She conceptualized and orchestrated the launch of One Mind’s seminal programs, Apollo, an informatics research portal and, Gemini, an international TBI/PTSD research program. She serves on several advisory boards including Brain Canada, Prophase, Pear Therapeutics, PAASP and IMEC for nanoelectronics. Magali earned her BS in bioengineering from the University of Pennsylvania, an MS in biomedical engineering from Rutgers University, New Jersey, and her MD PhD with distinction in neuroscience from Albert Einstein College of Medicine, New York.

Michael Sullivan Board Treasurer



Michael C. Sullivan is a Managing Director, Chief of Staff, and the Head of External Affairs of Point72 Asset Management, L.P. Mr. Sullivan joined the Firm in 2007 after working as a senior aide to a United States Senator, focusing on telecom, technology, and finance issues. Before serving in the U.S. Senate, Mr. Sullivan worked for a Member of the U.S. House of Representatives who sat on the Energy and Commerce Committee. Mr. Sullivan was the Director of Planning and Strategy for the United States Telecom Association before working on Capitol Hill.

Mr. Sullivan received his BA in Communications and Political Science from Vanderbilt University. Mr. Sullivan serves on a number of boards of organizations in the New York area. He is a member of the Executive Committee of StudentsFirst New York, a nonprofit organization advocating for educational reform in New York State. Mr. Sullivan sits on the Board of the NYU Cohen Veterans Center which is focused on research and treatment of veterans with Post Traumatic Stress and Traumatic Brain Injury and ConnCAN, an education reform nonprofit based in Connecticut. He is a member of the National Council of the American Enterprise Institute.

Theresa Frangiosa
Board Secretary



Theresa Frangiosa held executive positions in the pharmaceutical industry over a 25 year career before establishing Frangiosa and Associates, LLC in 2013, where she serves as Principal and Chief Executive Officer. She received her MBA in Pharmaceutical Marketing from St. Joseph's University. She is a Dementia patient caregiver and has been active in the Brain Disorder advocacy community for several years. Theresa also serves on the Board of Living Beyond Breast Cancer.

Douglas Haynes
Board Member



Doug Haynes is the President of Point72 Asset Management, L.P., originally joining the Firm as Managing Director of Human Capital in February 2014. Prior to joining Point72, Mr. Haynes was a Director at McKinsey & Company. Before joining McKinsey in 1992, Mr. Haynes worked for the Central Intelligence Agency and then GE's advanced materials business, which is now part of Sabic International.

Mr. Haynes earned a BS summa cum laude in Mechanical Engineering from West Virginia University, and received his MBA at the University of Virginia's Darden Graduate Business School, where he was a Shermet Scholar.

Mr. Haynes is an active community member, dedicating a significant portion of his efforts to supporting Veterans' initiatives. In addition to serving on the Board of the Robin Hood Foundation, Mr. Haynes helped launch its Veterans Advisory Board which raised over \$12 million to support the increase in veterans returning from Iraq and Afghanistan, and also works with New York-based companies to create more job opportunities for veterans. Mr. Haynes serves on the Corporate Advisory Board of the Darden Graduate School of Business, the Board of the Canterbury School, SingTel's Technology Advisory Board, and the Board of the Center for Global Enterprise.