DEEP INSIDE A BOSTON VA HOSPITAL, about two miles south of Fenway Park, four gray freezers are set at a constant temperature of –80°C. The chill protects the precious contents: samples donated to the nation’s first ever brain bank for post-traumatic stress disorder (PTSD). There, scientists will dissect the brain tissues by shaving some into translucent slices resembling the pickled ginger served with sushi and turning others into chemical soups. Then they will become fodder for researchers trying to better understand what exactly goes wrong—at the cellular level—in the brains of people saddled with trauma.

The payoff could be immense. As many as 500,000 U.S. troops who served in the wars in Afghanistan and Iraq over the past 13 years have been diagnosed with PTSD. The toll can be enormous. Without adequate treatment, PTSD can ruin lives and destroy families.

The trouble for these veterans is that there is a dearth of adequate treatments, and what works for one person might not work for another. That’s in part because when it comes to PTSD, there’s still a lot that experts don’t understand. Which is where the brain bank comes in. Scientists hope that investigating brains that once belonged to people with PTSD could yield important biological insights that might improve care for the hundreds of thousands of people who suffer from it.

“The burden of PTSD in service members who have been deployed in support of Operation Enduring Freedom in Afghanistan since 2001 and Operation Iraqi Freedom since 2003 is staggering,” the National Academy of Sciences reported in an exhaustive 300-page study last June.

And while the U.S. spends $3 billion per year to treat the disorder in military veterans, just how that treatment is administered is uneven at best. Through its investigation, the report’s authors discovered that some veterans were given...
Hunting for the Source

The brain has always been a challenging puzzle for researchers. The electrical impulses and biochemical reactions that play out in the brain, seeping inside each of the body and mind. Their interplay, wrote Charles Sherrington, a Nobel Prize–winning early 20th-century brain researcher, is “an enchanted loom where millions of flashing shuttles weave a disolving pattern, always noneigahing to some pattern, although never an abiding one, a shifting harmony of subpatterns.”

PTSD disrupts those harmonious interactions among the brain’s 100 billion cells, generating symptoms ranging from hypervigilance to depression to sleeplessness. Its insidious and multiple manifestations (there are up to 656,120 symptom combinations, two psychologists calculated in 2013) make PTSD especially vexing to treat.

“PTSD evolves based on the cultural conditions of the people who suffer through it,” says David Morris, a former Marine who chronicled his condition in the book The Evil Hours: A Biography of Post-Traumatic Stress Disorder. “The neuroscientific in PTSD is less clear than it is for manic depression or Alzheimer’s.”

At the brain bank in Boston, McKee and her colleagues hope to learn how to recognize the physical changes underlying PTSD and treat it for people with PTSD.

For years, doctors have been pushing for a government-backed brain bank to study PTSD—and pointed to the important research breakthroughs from the more than 50 brain banks in the U.S., many privately funded, for maladies like Alzheimer’s and depression. “We have favored getting a brain bank going for a long time, but nobody in government seemed interested,” says McKee, the executive director of policy at the nonprofit Vietnam Veterans of America. “The VA says it’s very important.”

Matthew Friedman ran the Department of Veterans Affairs’ National Center for Posttraumatic Stress Disorder, from 1998 to 2013. In 2004 he wrote that increasingly sophisticated functional-MRI research was shedding new light on the “neurobiopsychology of fear and anxiety” inside human brains. Figuring out why neural networks crank up and others shut down, he argued, requires methodical brain dissection and analysis. In other words, a brain bank.

Yet neither the Pentagon nor the VA pushed for its creation, and neither Friedman, even asked by McKee, “Why this problem,” Friedman says, “was getting secure funding.”

That finally changed last year, when Vermont Senator Patrick Leahy, a senior Democrat on the Appropriations Committee, added $1.5 million to the federal budget to create what will become the VA’s Leahy-Friedman National PTSD Brain Bank. “We’ve spent a lot of time and effort getting men and women ready to go to war,” Leahy says. “I’ve always felt that we need more attention paid to helping them when they come home.”

The brain bank will fuel PTSD research across the nation, with scientists at other institutions borrowing brain samples for their own work. And the bank’s benefits extend well beyond vet PTSD can affect anyone who experiences trauma, from bad falls to crimes like robbery or home invasion. In fact, many experts believe that the sudden loss of a loved one or an abusive or even negligent childhood can trigger PTSD. The next generation of Americans will suffer from it at some point during their lives. If scientists have experienced PTSD are optimistic about the brain bank’s work. Jim Doyle spent 1969 in Vietnam as an Army infantryman and struggled with PTSD for 15 years. “PTSD is real. It’s not somebody trying to scam the system. Some of the guys who are lucky to be on the shore are just people who are not people who are just doped up,” says Doyle, now 65 and living in Fresno, Calif. He’s hopeful that the brain bank means that the next generation of soldiers won’t need to wage a second war when they come home.

“Maybe they’ll be able to find the physical manifestations,” Doyle says. “That was normal for the next war was to have to go through years of fighting themselves, and everyone around them, and he was able to do what’s going on inside their own head.”

The brain bank will fund PTSD research across the nation, with scientists borrowing brain samples for their own work.

Sample size PTSD investigators will study thin slices of brain tissue for evidence of physical changes.