

# New approach may limit damage in brain injuries

By Kelly Kennedy

KELLYKENNEDY@MILITARYTIMES.COM

Scientists know the brain damages itself further after a traumatic head injury by releasing a chemical that can kill many more brain cells — an issue hundreds of Marines and soldiers face in the wars in Iraq and Afghanistan.

But researchers haven't been able to use drugs to contain the naturally occurring substance — called glutamate — because the drugs don't eliminate it. After a drug leaves a person's system, the glutamate remains, and it can continue to kill brain cells.

"Once [drugs] disappear from the brain, the excess glutamate is still there and will resume its neurotoxicity — so no long-lasting therapeutic effects can be achieved," said Vivian Teichberg of the Weizmann Institute of Science's Neurobiology Department in Israel.

He and his colleagues have found a promising new approach. After years of trying to wrap their brains around the problem, the researchers think they've found a way to wrap the problem around the brain.

Normally, glutamate works as a neurotransmitter — a chemical that transmits signals across gaps between cells in the brain. Glutamate is believed to help with learning and memory. But it's also a stimulator, and too much is like a kindergartner on cotton candy. So the body also has glutamate "transporters" — or pumps — that gather the chemical into brain cells after it has done its job.

But after a head injury, the glutamate becomes toxic when it pools outside the injured brain cells and then overexcites neighboring healthy brain cells until they die.

Through research on rats, a solution may have been found, Teichberg said.

## Diminishing glutamate

Rather than using a drug, researchers activate a blood enzyme that normally travels through the brain to mop up excess glutamate.

Blood naturally has higher levels of glutamate than brain fluids do, and if blood glutamate levels become low, it kicks the glutamate pumps into high gear. So if scientists could lower glutamate levels in the blood, the pumps would quickly work to gather glutamate in the brain.

Teichberg and his associates used an enzyme called glutamic-oxaloacetic transaminas, or GOT, also a naturally occurring substance in blood. GOT can bind glutamate chemically to inactivate it. In the experiment, activating GOT lowered glutamate levels in the blood of rats with traumatic head injuries, which caused the pumps to pick up the excess glutamate in their brains and dispose of it in the blood.

Military health experts call traumatic brain injuries the "signature injury" of the current wars. Advances in body armor are allowing many more troops to survive explosions that once would have killed them, but those explosions still

wreak havoc on their brains.

Because of the potential value of the current research to the military, Teichberg plans to present the work to the Defense Advanced Research Projects Agency. He said clinical trials are

planned for the near future.

Teichberg offered a caveat to the research, however: This hasn't been tried on humans yet.

"There has been quite a large number of successes at treating rats for various conditions, includ-

ing brain injuries and cancer, that met with total failures in human clinical trials," he cautioned.

Still, he said he's hopeful this approach will succeed where previous brain-injury research using drugs to control glutamate have failed. □



## First Deployment?

You can't predict when—or to where—you'll be called. But you can enjoy the assurance that your family finances are deployment-ready with help from First Command.

Your First Command Financial Advisor can help you develop an insurance strategy that provides for the people and protects the things you value most. And First Command Bank can help you manage your finances, wherever you are, through free online banking and Web bill pay—even a no-fee Visa® credit card for emergency cash or major purchases.

Committed since 1958 to improving the financial well-being of America's military families, we're here to help you—through a lifetime of first times.

Call 800.443.2104 today  
or visit us at  
[www.firstcommand.com](http://www.firstcommand.com)



INVESTMENTS | INSURANCE | FULL-SERVICE BANKING

©2006 First Command Financial Services, Inc., parent of First Command Financial Planning, Inc. (Member SIPC) and First Command Bank. Investment products and services, including securities, are offered by First Command Financial Planning, Inc. Insurance products and services are offered by First Command Financial Services, Inc. Banking products and services are offered by First Command Bank. Securities products are not FDIC insured, have no bank guarantee and may lose value. A financial plan, by itself, cannot assure that retirement or other financial goals will be met. In certain states, as required by law, First Command Financial Services, Inc. does business as a separate domestic corporation, and does business in California as "First Command Insurance Services."