“Burke Medical Research Institute Scientists Show Axon Growth Possible in Central Nervous System”

White Plains, NY – May 21, 2014 – Recent findings by Burke Medical Research Institute scientists could one day pave the way for new treatments for spinal cord injuries. The study, published as a cover story, with commentary, in the current issue of the *Journal of Experimental Medicine*, found, for the first time, that activating a protein known as B-RAF promotes the regeneration of injured axons in the central nervous system of mice. Until now, it was thought that axons—which conduct signals between neurons—could not re-grow or be restored after an injury in higher animals such as mice, or in humans. Injuries, such as those affecting the spinal cord, can damage these axons, making their regeneration an important first step towards possible recovery.

Since earlier studies found that axon growth can be blocked by disabling B-RAF, the researchers wanted to find out if activating B-RAF could—in contrast—help promote axon growth and regeneration.

The team, led by Jian Zhong, Ph.D., director of the Molecular Regeneration and Neuroimaging Laboratory at the Burke Medical Research Institute in White Plains and assistant professor of neurology and neuroscience at Weill Cornell Medical College in New York City, found that axon growth was promoted in three distinct scenarios. These were: in a developing mouse embryo that didn’t have an important normal axon growth signal, in injured sensory neurons whose axons grow into the central nervous system, and then in an injured optic nerve, which is part of the central nervous system.
“Not very long ago, we were not sure if neurons in the mammalian central nervous system could ever regrow axons to any useful lengths at all,” said Dr. Zhong. “Now, we see that by activating the B-RAF protein, the possibility is there. And that possibility could lead to exciting progress in the field of spinal cord injury treatment and rehabilitation.”

While there is no conclusive data on spinal cord injury at the moment, the optic nerve data makes it very likely that the B-RAF activation will also stimulate regeneration after spinal cord injury—though additional research needs to be done, said Dr. Zhong.

“These significant findings represent the importance of basic research for rehabilitation and the effects it will continue to have on how we approach treatment and help patients with various injuries, including those to the spinal cord,” says Rajiv R. Ratan, M.D., Ph.D, executive director of Burke Medical Research Institute and professor of neurology and neuroscience at Weill Cornell Medical College.

Scientists from the Burke Medical Research Institute included Dr. Zhong as well as Kevin J. O'Donovan, Ph.D., Kaijie Ma, B.M., and Hengchang Guo, Ph.D. Also contributing to the study were scientists from Harvard Medical School, Temple University School of Medicine, Icahn School of Medicine at Mount Sinai, and Centre Hospitalier Universitaire de Quebec in Canada. The study was supported by the National Institutes of Health, the Whitehall Foundation and the Burke Foundation.

About Burke Medical Research Institute
Burke Medical Research Institute is part of the Burke Rehabilitation Center, which also comprises the Burke Rehabilitation Hospital. The hospital is a private, not-for-profit, acute rehabilitation hospital that is the only hospital in Westchester County dedicated solely to rehabilitation medicine. Founded in 1915, Burke offers both inpatient and outpatient programs for those who have experienced a disabling illness, traumatic injury or joint replacement.
surgery. Along with the hospital’s world-renowned doctors and therapists providing state-of-the-art-treatment, Burke Medical Research Institute scientists explore the frontiers of rehabilitation medicine. All share the Burke mission to ensure that every patient makes the fullest possible recovery from illness or injury regardless of their ability to pay. For additional information on Burke Rehabilitation Center, please visit burke.org.