



From left: Cedric Geoffroy, Jen Dulin, Dylan McCreedy, Hangue Park

Texas A&M Research Holds Great Promise For Patients With Spinal Cord Injury

An interdisciplinary team of scientists assembled by a “cluster hiring” initiative are combining diverse expertise in hopes of helping people with the devastating injury.

When Dylan McCreedy was 18 months old, he was hospitalized for several weeks with spinal meningitis. Left untreated for more than a few hours, the infection involving the fluid and membranes around the brain and spinal cord can cause brain damage and even death.

McCreedy survived the painful experience, though it resulted in severe hearing loss in his right ear. His struggle became his motivation, prompting McCreedy, an assistant professor of biology, to pursue an academic research career focused on finding new treatments for spinal cord injury (SCI).

Joining what’s called a “cluster hire” along with McCreedy were Jennifer Dulin, assistant professor in the Department of Biology, College of Science; Cédric Geoffroy, assistant professor in the Department of Neuroscience & Experimental Therapeutics, Health Science Center; and Hangue Park, assistant professor, Department of Electrical Engineering, College of Engineering.

Each researcher is approaching SCI using his or her unique expertise. Dulin is working on an experimental strategy to replace the nerve cells (neurons) that are lost due to injury or degenerative disease with neural stem cells, which are immature cells capable of regrowing new tissue, while McCreedy is developing neuroprotective therapies that can be applied early after injury in the hospital or on the battlefield. Geoffroy is discovering and testing novel gene therapy approaches to promote regrowth of injured nerves, and Park is engineering cutting-edge devices to functionally stimulate the injured nervous system.

Unlike other organs of the body, the brain and spinal cord do not regenerate after injury.

“Spinal cord injury profoundly affects the lives of the patient, as well as the family,” McCreedy said. “It is a great financial burden and irrevocably affects quality of life.”

“There is a great deal of collaboration between our four labs as well as other spinal cord injury research labs at Texas A&M. We are all working together to combine our distinct approaches in order to advance toward powerful new treatments.”

The cluster hire was made possible by a gift of \$1.4 million to Texas A&M from The Institute for Rehabilitation and Research (TIRR) Foundation, a nonprofit organization dedicated to improving the lives of people with neurotrauma and neurodegenerative disease. The donation supported the hiring of four scientists working in the area of spinal cord injury research.

More than 250,000 people in the U.S. are living with paralysis from SCI, while 17,000-plus new injuries are reported annually, according to the National Spinal Cord Injury Statistical Center (NSCISC). Individuals with SCI incur up to \$1 million in healthcare and living costs in the first year alone and upwards of \$5 million in lifetime expenses. Patients have a reduced life expectancy and many suffer from chronic pain for which very few treatment options are available. These debilitating injuries cost the U.S. health care system \$40.5 billion annually. Most new SCI cases — about 78 percent — are male patients and most are caused by vehicle crashes, followed closely by falls, NSCISC reported.

The great advantage of this research endeavor at Texas A&M lies in its interdisciplinary nature — a hallmark of cluster hiring.

“In many cases, cluster hires are spearheaded by a single department looking to build strength in a particular research area. In contrast, multiple colleges at Texas A&M participated in our cluster hire,” said Dulin, who earned her bachelor’s degree in biochemistry from Texas A&M in 2005. “In our case, the initiative to recruit a group of new faculty with diverse research approaches worked beautifully.

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McCreedy agrees, saying the researchers have complementary expertise and the collaborative nature of the project advances the capabilities of all of the labs involved.

“In addition, it has provided national recognition for Texas A&M as a strong environment for spinal cord injury research,” he said.

Additional Texas A&M collaborators include researchers at the College of Liberal Arts, the College of Veterinary Medicine & Biomedical Sciences, as well as the Texas A&M Institute for Neuroscience.

SCI is a complex problem with no single “magic bullet” cure, Dulin said, but interdisciplinary research is one of the most powerful weapons in the fight. Clinically successful therapies will most likely require combined treatments targeting multiple aspects of disease pathology ranging from protective therapies in the very early stage to rehabilitative therapies years after injury.

“Testing these kinds of combinatorial approaches would be exceedingly difficult without an environment of diverse spinal cord injury research expertise,” Dulin said. “This is a huge advantage of the spinal cord injury cluster hire at Texas A&M – it has brought together a group of scientists with unique backgrounds and highly diverse expertise who are united in our commitment to developing better treatments to improve the quality of life for these individuals and their families.”