Researchers advance spinal cord injury treatments

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(PhysOrg.com) -- A full recovery from a spinal cord injury? Don't hold your breath. Actually, according to Gordon Mitchell, a professor of neurosciences at the UW School of Veterinary Medicine, holding your breath might be exactly the right thing to do.

Mitchell and team members from the University of Saskatchewan, The Rehabilitation Institute of Chicago, and the Emory School of Medicine are researching innovative spinal cord therapies that earned them the Translational Research Partnership Award this year. Their research will use short periods of oxygen deprivation to increase spinal cord plasticity, essentially training the spinal cord to compensate for injury.

The award recognizes the team's efforts to bring together people from different schools to translate research into real-world applications. Years ago, this research was born from the work of the Mitchell laboratory in the UW School of Veterinary Medicine.

The team came together when Mitchell partnered with Gillian Muir, an associate professor of veterinary biomedical sciences at the University of Saskatchewan who did a one-year sabbatical in the Mitchell laboratory, and Randy Trumbower, then a postdoctoral fellow with Dr. Zev Rymer at the Rehabilitation Institute of Chicago. Trumbower since moved to Emory University, where he is an assistant professor of rehabilitation medicine. Between the fields of neurology, veterinary science, and physical rehabilitation, these three created the ideal team to tackle spinal cord injuries. Their success caused Mitchell to pursue the Translational

Research Partnership award as a grant opportunity.

"I wanted this partnership to continue," Mitchell says.

Their grant, entitled "Intermittent Hypoxia Elicits Prolonged Restoration of Motor Function in Human Spinal Cord Injuries," offers the team a two-year budget of $750,000 to be coordinated between them as they explore a new therapy for spinal cord injuries.

The treatment, which was inspired by some curious effects seen in sleep apnea patients, involves a breathing mask that provides oxygen, then intervals of oxygen deprivation. The brief periods without oxygen cause the patient's body to compensate, training their motor neurons to improve breathing.

"But the effects we were having weren't restricted to respiratory motor neurons," says Mitchell. Preliminary results show an astounding increase in limb muscle function and control, both in rats and humans with partial spinal cord injuries, even after the first treatment.

The team hopes to pair this treatment with physical therapy to get the most out of the "training" of the spinal cord. "It's nearly impossible to get the spinal cord to regrow," Mitchell says, "but you can train it to do better."

He hopes that this research will reach the public quickly because it is not a drug, and may move through FDA approval quickly if their efforts are successful.

Mitchell predicts that the new treatment could have huge effects on pets with spinal cord injuries from accidents or herniated discs. "Right now, most of them are simply killed because the prognosis is so bad," says Mitchell.

The concept is getting attention for the potential human benefits as well. Because of the interest the Department of Defense is taking in helping soldiers with spinal cord injuries, they are funding the award through the Congressionally Directed Medical Research Programs.

According to the Nov. 4, 2009 issue of USA Today in an article entitled "Spinal injuries up among troops," the rise of roadside bombs has dramatically increased the number of spinal cord injuries as soldiers are battered within the confines of an armored vehicle.

Mitchell explains that most of these patients have only partial spinal cord injuries, meaning his new treatment has big potential to help them. With these implications to human and animal health on the horizon, Mitchell's team plans to begin their work this September.

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