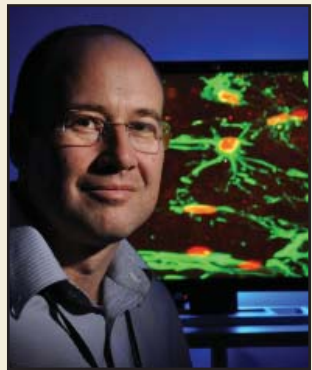




Breakthrough could help heal spinal cord injuries without pain

Researchers at the University of Colorado Denver say manipulating stem cells prior to transplanting them holds the key to using stem cell technologies for repairing spinal cord injuries in humans.



In the online *Journal of Biology*, Dr. Stephen Davies, associate professor of neurosurgery, reports his research team has for the

first time produced two types of spinal cord support cells called astrocytes ("star" cells) from the same embryo derived stem cell-like cells called Glial Restricted Precursors (GRPs) that have remarkably different effects on the injured spinal cord.

Nerve Fiber Regeneration

As astrocytes constitute the majority of cells in the brain and spinal cord and play important roles in supporting normal nervous system function, there is a great deal of interest in using stem cell technologies to replace astrocytes lost after brain and spinal cord injury.

By giving the right signaling molecules to the GRP cells, Davies and co-workers were able to turn them into a type of astrocyte called GDAs^{BMP} that promoted robust nerve fiber regeneration and functional recovery when transplanted into spinal cord injured rats. However transplanting the stem cell-like GRP cells alone or another type of GRP derived astrocyte called GDAs^{CNTF} into spinal cord injuries failed to provide any benefits and instead promoted pain syndromes.

Davies and his team, including Jeannette Davies, an assistant professor of neurosurgery at UC Denver, consider their discoveries of a type of astrocyte that is highly beneficial for spinal cord repair, and that transplantation of stem cells or the wrong type of astrocytes such as GDAs^{CNTF} can be highly detrimental, are major breakthroughs that will change the way stem cell technologies are used to promote repair of the injured spinal cord.

Hope for Victims of Paralysis

To that end, Davies and his collaborators are developing a safe, efficient and cost-effective way to make human GDAs^{BMP} from either embryonic or preferably adult stem cells with an eye toward testing this new cell replacement technology in humans. The eventual result of all his research, Davies hopes, will be a fast and pain-free spinal cord recovery process that paves the way for victims of paralysis to recover the use of their bodies.

My Story, by Luke Vogel

In the past year of my life I have been forced to make decisions I would never want to make. On a normal Tuesday in December of 2007, I fell while skiing and suffered a severe broken neck. It was an injury that left me paralyzed at the 5th and 6th vertebrae of the cervical region, which is that bump on the back of everyone's neck. I spent three months in the hospital, time I would very much like to forget. In due time, I gradually acquired movement in my arms, shoulders, and a little bit in my hands.



During my stay in the hospital, I spent three weeks in the intensive care unit. I was slowly working towards getting all the movement out of any functioning limbs. As an athletic person, the last place I wanted to be was partially paralyzed in a hospital bed for three long months. For probably two and a half months, I lived with the false idea that I was going to walk by the end of my stay in the hospital. It was very disheartening to learn that was not going to be the case. Instead, I have been living with my partial paralysis now for 12 months, slowly working towards walking again. Though it's not certain I will walk again, I do my best to stay active and happy.

Living with my injury is a day-to-day struggle. Every day is unique, and every day is hard. Every moment I'm reminded of how thankful I should be, but I am not always. Currently in my condition, I receive function in my arms and a little bit of feeling in my legs. I go three times a week to work out and do therapy in Boulder, Colorado. I've been going for about eight months with little improvement in my legs. As you can imagine, it's been very upsetting not getting the results I expected. This has affected my life drastically. I stay home most nights and spend a lot of time with my family, unlike a typical 17-year-old. Also, as a younger kid I had dreams of becoming a sports star or successful in the business world. I live in a family full of amazing achievers in business and in sports, and now I have to completely change my plan and my approach.

Even though I was injured skiing, I would still like to be involved with outdoor sports. Before I was injured I had been filming and putting together a "sponsor me" video. I didn't really care if I was sponsored, but it was fun filming and feeling like I was good at skiing. Now that is not an option, but I have always been interested and fascinated by skiing. Specifically, I loved free skiing in the terrain parks, on hand rails, and in the half pipe. I am constantly trying to learn more about skiers and companies and what makes them work. To just be involved in a ski company would feed my need for skiing because I cannot do it anymore.

For now I'm striving to live a normal life independent of others but I am unique and I bring a lot of needs and demands. I'm motivated to better my life in school and out in the real world and I want to be successful. My life and self image changed with my accident but my ability to make a difference and dreams of the future have not. I'm not alone and my hope is that medical research will find a way to help me and others like me walk again. Please join me and thanks for your help.

Make a Gift and Make a Difference



Our son Luke was injured on December 11, 2007 and we are 15 months into a 24-month natural recovery process. Through Luke's injury and rehabilitation we have met a number of people in the medical research area looking to find a cure for paralysis. The commonality of Luke's injury to multiple sclerosis, Lou Gehrig's disease and other conditions affecting the spinal cord and central nervous system function has brought us in touch with many working diligently to find solutions.

We are most fortunate to have Dr. Stephen Davies and his research lab right in our own back yard at the Anschutz Medical Campus. Carol and I have made financial contributions to Dr. Davies' efforts and we have set a goal of raising \$5 million to advance his research in an effort to give Luke and others like him the chance to walk again. We need your help...Your gift to the University of Colorado Denver could help change a life or save a life.

Thanks again for your friendship and support, we need it and wouldn't have much of a life or hope without it.

Carl Vogel