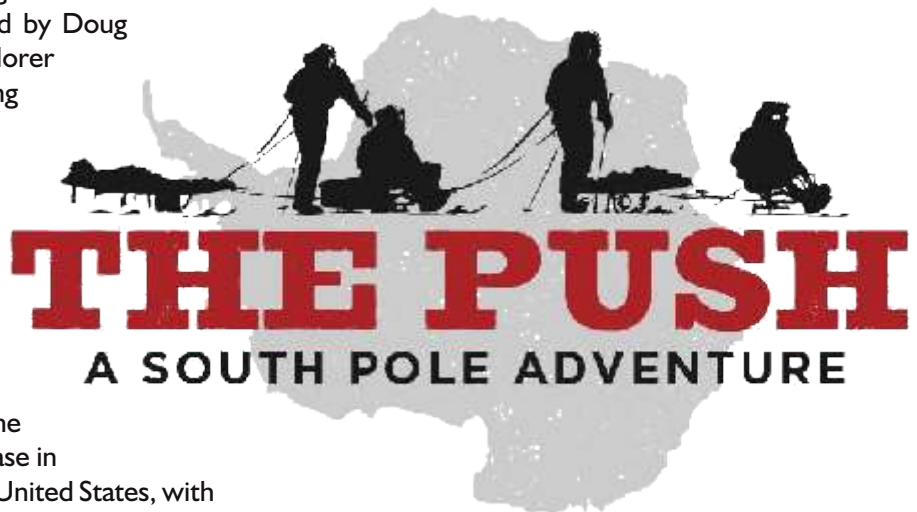


Spinal Connections

In January 2012, for the first time in history, two adaptive athletes will push the limits and themselves to the most inhospitable place on the planet – the South Pole. The chosen date marks the 100th anniversary when Captain Robert Falcon Scott's Terra Nova expedition reached the earth's most remote spot. The expedition includes two adaptive athletes; John Davis, a two time Paralympic gold medalist, and Grant Korgan, a world class kayaker and adventurer. Both Davis and Korgan are athletes with spinal cord injuries. The team is led by Doug Stoup, the world's most traveled explorer to the North and South Poles, along with seasoned guide Tal Fletcher.

The training leading up to the adventure, along with South Pole expedition, will be showcased through a TV series and full documentary film. There will also be a large media campaign with interviews anticipated on major network talk and news shows. The documentary film is expected to release in the Fall of 2012, rolling out first in the United States, with a San Francisco premier, and then internationally. The TV series, to air on cable, is expected to showcase in October 2012 as well.



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Davis and Korgan will demonstrate through this expedition – as they literally push themselves 100 miles across the frozen Antarctic landscape – the capacity of the human spirit to overcome life-altering injuries. Perhaps more importantly, the team hopes to inspire people in all walks of life to help others achieve the seemingly insurmountable, to push their own everyday limits, and to live up to their ultimate potential.

The Push expedition could face temperatures as cold as -70 degrees Fahrenheit with winds blowing at up to 125 mph on a vast, icy, barren landscape sitting 9,000 feet above sea level with no place for refuge except for a tent. Strong winds called katabatics clocked at 154 mph can often create snow storms which will change the snow coverage at any given area, often creating hard snow waves, which are often two meters high. Grant and John will push on sit skis an approximate 176,000 pole strokes across the frozen terrain. The team will pull their own gear weight in total over 400 pounds. The typical person faces life threatening risks such as frostbite, high altitude pulmonary disease, and hypothermia. For these two adaptive athletes the risks are even greater. The athletes will burn approximately 10,000 calories a day and the most simple tasks – boiling water, walking, breathing are exponentially more difficult at the South Pole. For nearly two weeks, this will be their world, pushing 100 miles over brutal terrain on a custom sit ski designed specifically for this trip and expected to open new doors for adaptive athletes engaging in winter sports.

Continued on page 3...

Geron Clinical Trial Halted

In a huge surprise, Geron announced on November 14 that they were halting their clinical trial of stem cells for spinal cord injury, and indeed, were getting out of the business of stem cells entirely. Instead, they will focus on drugs they have in the pipeline for cancer. This was apparently strictly a business decision, and was not triggered by any adverse event in the people who have received stem cells. Geron announced that it will continue to follow the patients who received stem cells, but will not enroll any new patients except for patients who were already in the pipeline. And in fact, two days after Geron's announcement, a 5th patient received a stem cell transplant at Stanford University.



Dr. Oswald Steward

This doesn't affect any of the research at the RIRC. Geron doesn't fund anything that is going on here right now, and in fact hasn't funded anything for several years since the early studies by Hans Keirstead that formed the basis of the trial. It is likely to be seen as a big symbolic setback, however, because the pipeline from the lab to the clinic has suddenly been shut down.

What does Geron's surprising decision mean for the future development of stem cells for clinical applications? It's really too early to say, but progress in developing stem cell therapies will likely be slowed, at least for now. Geron had invested tens of millions on this trial, and was the undisputed leader of the companies in the field. On the other hand, this isn't the only trial going on right now, or the only trial involving stem cells for spinal cord injury.

Geron has announced that it will try to sell its stem cell assets, and perhaps some other company will step in to continue what Geron started. But the Geron team that supported the program will lose their jobs, and if another company takes up the program, they will have to re-assemble a team to support the program. Some companies have apparently expressed an interest, but we will have to wait and see whether and how this happens.

Only the management team at Geron knows exactly what calculations drove the decision. From the beginning, it was clear that the first trial would take at least 2 years, and that moving from the initial safety trial through to the point that there could actually be an approved therapy would take several years more. It was also clear that the trials would cost a lot of money. Maybe the continuing situation with the economy made it impossible to continue to raise capital for something that would take as long as the trials certainly would have. One lesson is that there are economic challenges to developing stem cell therapies that had not been fully appreciated, at least by most people. This could mean that other companies will take a hard look before starting down the path, at least for now.

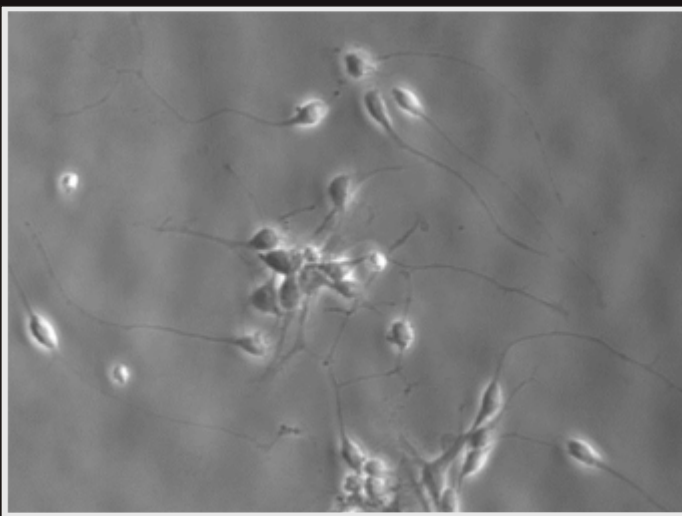
Another possible lesson is that we may need to re-think the model for moving scientific discoveries to the clinic, especially for stem cell applications. The model has been that once the discovery was made and enough pre-clinical work had been done, then further development would be by private companies who could anticipate a profitable product in the end. The problem with this model is that at any point in the process, a company may decide to abandon a promising direction that doesn't promise a profit in a reasonable time frame. That's what seems to have happened here.

One alternative model is a much greater involvement of academic centers in product development. Development of a therapeutic product might have to be driven in part by philanthropy rather than venture capitalists. The people who donate would not be able to expect windfall profits, but would be assured that success would improve the lives of people.

It's important not to lose sight of the fact that Geron blazed a trail by establishing a path to FDA approval for stem cell therapies. There are other trials ongoing, including the trial sponsored by Stem Cells Inc. that is based on the discoveries of Aileen Anderson and Brian Cummings here at the Reeve-Irvine Research Center. And there are other promising discoveries pointing the way toward potential therapies that don't involve stem cells. Very important lessons were learned in setting up the Geron trial that will carry over to other trials of interventions during the acute post-injury period.

We knew from the beginning that the development of new stem cell treatments would not be without setbacks. It is good that the setback here was not due to a problem with the treatment itself. Also, the 5 people who already received stem cell transplants will be followed, providing hugely important safety information regarding stem cell implants into the nervous system.

Very important lessons were learned in setting up the Geron trial that will carry over to other trials of interventions during the acute post-injury period.



Neurite outgrowth of neural progenitor cells
18 hours after addition of 200 nM PTEN inhibitor.
Image taken at 20x magnification.

Keirstead Research Group Begins a New Approach to Treat SCI

The laboratory of Dr. Keirstead has initiated an entirely new stem cell approach to treat spinal cord injury. This is part of Dr. Keirstead's ongoing strategy to build upon previous successes in his laboratory and other laboratories, in an effort to optimize treatments.

Lindsay Wyatt, a new graduate student, is leading this new project at the bench. Lindsay is a first year Master's student, with an intense desire to uncover biological mechanisms that pertain to spinal cord injury regeneration, and develop treatments.

Stem cell-based transplantation approaches to SCI show tremendous promise. Spinal cord cells derived from stem cells have been shown to benefit SCI following transplantation by secreting growth factors that 'nurse'

the injury environment. However, they do not extend connections to promote communication above and below the injury site, or amongst cells around the injury site. Recently, Drs Zhigang He and Oswald Steward have demonstrated a novel way to dramatically increase growth of connections. This involves manipulating a molecule called 'PTEN' within nerve cells, which unleashes a potential for growth that is otherwise suppressed. Building upon this discovery, Dr. Keirstead will modulate the PTEN pathway in stem cell-derived spinal cord cells prior to their transplantation into spinal cord injured rats, in an effort to promote robust outgrowth of communicating processes from the transplanted cells. If successful, this combination would provide an entirely new transplant population that could 'nurse' the SCI, AND promote connections above and below the injury site.

"The Push" South Pole Adventure to benefit Reeve-Irvine

"The Push" - Continued from Cover

The High Fives Foundation, a Tahoe based non-profit dedicated to helping athletes suffering life-altering injuries recover and ideally get back to their sport, and the Reeve-Irvine Research Center, whose mission is to find cures for spinal cord injury through scientific research will benefit directly from the efforts of The Push team. Our Center is eternally grateful to this group for approaching us hoping to make this momentous event even more meaningful to those who need to believe in a better future. Please be sure to tune in to view this incredible expedition. If you are interested in additional information about this effort please contact Tania Joep at 949-824-5925.



Athletes Grant Korgan and John Davis led by renowned Explorers, Doug Stoup and Tal Fletcher in the South Pole.

Anatomy 101: Gene therapy using viral vectors and shRNA

The basic goal of gene therapy is to specifically manipulate the profile of genes expressed by a cell. The use of gene therapy as a therapeutic strategy is being explored for many diseases and conditions, both in the laboratory and in clinical trials. Currently, there are more than 1700 gene therapy clinical trials worldwide, with greater than 60% being held in the USA [1]. The majority of these gene therapy trials involve the use of viral vectors. While gene therapy may suggest the idea of increasing the expression of a specific gene or replacing a defective gene with a functional one, another type of gene therapy is to temporarily suppress or "silence" a gene. In this article we will discuss the use of viral vector mediated gene therapy and small hairpin RNA molecules (shRNA) to specifically silence genes.

What are viral vectors?

Based on the notion that viruses efficiently infect cells, a number of viruses have been modified for the explicit purpose of delivering genetic material into a cell. Thus, a virus vector is a virus that has been modified in the laboratory to serve as a genetic delivery system. The main modification is removal and/or replacement of nonessential or pathogenic viral genes to make a "virus shell" in which a gene of interest, called a transgene, or a shRNA can be placed. The result of this modification is a transgene packaged in a virus vector delivery system (Figure Steps 1, 2 & 3). Naturally, the greatest concern of using virus vectors for gene therapy in humans is safety. Molecular biologists have now developed a number of virus vectors that display low toxicity. At the top of this list is adeno-associated virus (AAV) vector. AAV is a small single stranded DNA virus that occurs in nature and infects humans. However, since AAV triggers only a mild immune response, it does not cause disease or sickness. Additionally, transgene expression from recombinant AAV vectors (rAAV) is stable and fairly long term (on the order of months). Of particular interest for neuroscientists is the fact that AAV preferentially infects neurons when injected into the nervous system.

Gene Silencing and shRNA

Every cell in an animal contains the entire DNA genome; however cells in the brain express a set of genes that are different from the set of genes expressed by cells in the liver. This is possible due to key steps that occur in the protein synthesis process. Namely, in each tissue only specific portions of the total DNA, known as the genome, are transcribed into RNA, known as genes. For each cell, the profile of genes that are expressed is the genetic profile of that cell. The RNA is then further processed (translated) into proteins. Thus, gene silencing is equivalent to preventing a protein from being synthesized from the RNA. One way to achieve gene silencing is to use a small hairpin RNA or shRNA molecule designed to interfere with the translation of a specific RNA. shRNA molecules have two strands of RNA instead of the single strand found in naturally occurring RNA. Additionally, there is a single stranded hairpin loop structure (Figure Step 2). This is important because an intracellular complex called DICER recognizes the hairpin loop structure. We won't discuss the details of the DICER complex, but suffice it to say that DICER cleaves the double stranded shRNA molecule into two small single stranded RNA molecules (Steps 4 & 5). For example in the figure below, a shRNA designed to specifically target the PTEN gene is cleaved by DICER into two single stranded RNA molecules (Steps 2-5). One of the PTEN shRNA strands is complementary to the naturally expressed full length PTEN RNA. This strand is referred to as the antisense strand. This is important because this small piece of antisense RNA binds to the full length PTEN molecule like a zipper (Step 6). Because RNA occurs as a single stranded molecule in the cell, there is a mechanism that recognizes double stranded RNA as

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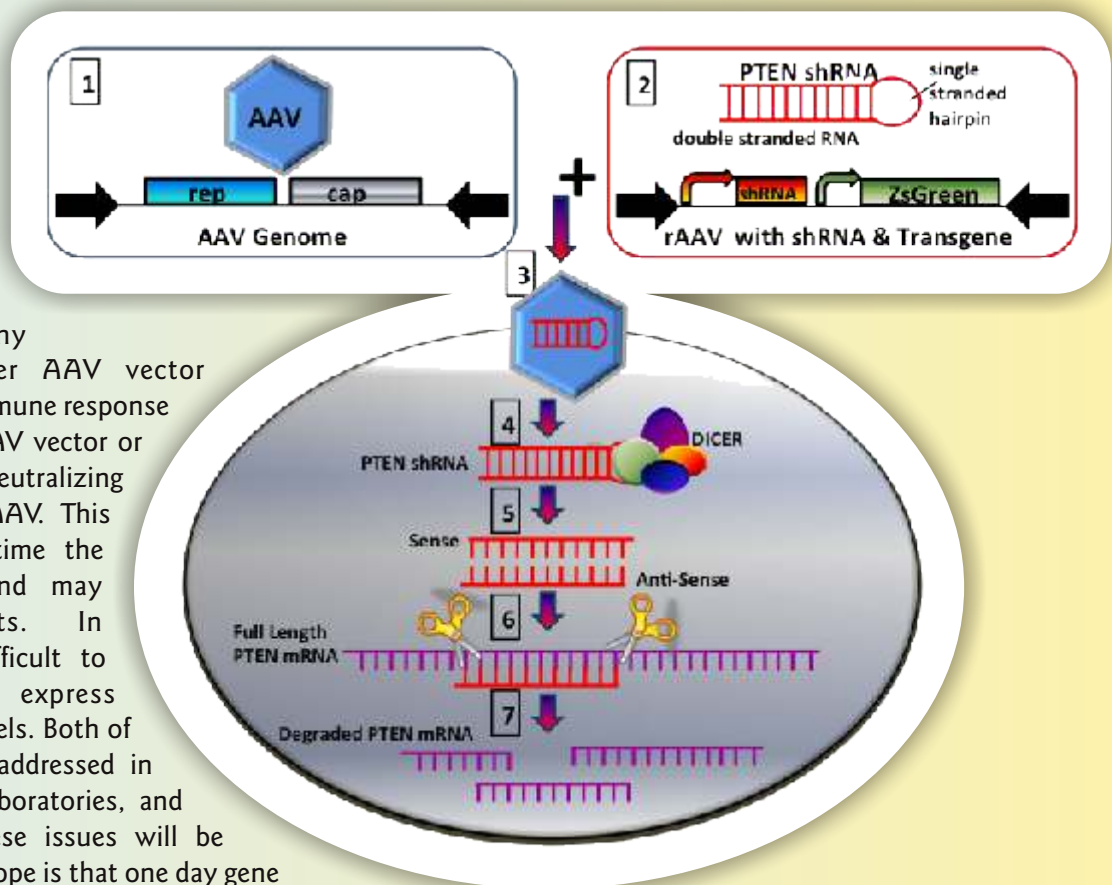
Aberrant and degrades it (Steps 6 & 7). Once the RNA is degraded, no protein can be synthesized. Thus, in our example, a shRNA designed to specifically target the PTEN gene causes the degradation of PTEN RNA thereby preventing (or silencing) the expression of the PTEN protein. It is important to note, that the DNA for PTEN is not deleted or degraded. So once the shRNA for PTEN is no longer around, the PTEN protein is once again synthesized.

Putting it all together for gene therapy after spinal cord injury.

The corticospinal tract (CST) originates in the motor cortex (neurons) of the brain and extends axons down through the spinal cord (See Anatomy 101 in Spinal Connections Number 19, page 6). Since spinal cord injury severs the axons of the CST, there has been a focused effort on therapies that promote axon regeneration. Amongst the most exciting potential therapies is the recent report that genetic deletion of PTEN in neurons of the motor cortex promotes CST axon regeneration after spinal cord injury in mice (Liu et al., 2010). Recently we developed, in conjunction with the University of Pennsylvania Vector Core, an AAV vector that expresses a shRNA specific for PTEN (AAV-shPTEN). We are now determining whether intra-cortical injections of AAV-shPTEN suppress PTEN in neurons of the motor cortex. Additionally, we will have to examine issues of safety and determine whether AAV-shPTEN mediated suppression of PTEN in neurons of the motor cortex does in fact promote CST axon regeneration after spinal cord injury.

Where does AAV gene therapy go next?

While there are no approved clinical uses of AAV vectors for gene therapy, the many clinical trials attest to the promise for the future clinical therapies. However, there are still a few challenges that need to be resolved. For example, while AAV does not cause any sickness in humans, after AAV vector administration a low level immune response can develop to either the AAV vector or the transgene producing neutralizing antibodies that remove the rAAV. This decreases the amount of time the transgene is expressed and may prevent therapeutic effects. In addition, it has proven difficult to deliver enough rAAV to express transgenes at therapeutic levels. Both of these challenges are being addressed in several molecular biology laboratories, and there is optimism that these issues will be resolved in the future. Our hope is that one day gene therapy will be a way to treat spinal cord injury.



1. Gene Therapy Clinical Trials Worldwide (Journal of Gene Medicine)
2. <http://www.abedia.com/wiley/index.html>

Liu K, Lu Y, Lee JK, Samara R, Willenberg R, Sears-Kraxberger I, Tedeschi A, Park KK, Jin D, Cai B, Xu B, Connolly L, Steward O, Zheng B, He Z (2010) PTEN deletion enhances the regenerative ability of adult corticospinal neurons. *Nature Neuroscience* 13:1075-1081.

Translational Science on the move in iMOVE

In the summer of 2010, we reported the opening of the Sue and Bill Gross Hall, a state of the art stem cell research facility. In addition to the laboratory space, there is also space set aside for human subjects research. Drs. David Reinkensmeyer, Steve Cramer, and Kelli Sharp have transformed that clinical space into a place of new technologies and innovations called iMOVE for people with disorders that affect the ability to move. An important focus of iMOVE is on developing outcome measures that can be used in future clinical trials with stem cells. An outcome measure is a qualitative or quantitative way to assess clinically important changes after an intervention, in our case, changes in motor function.

The idea of iMOVE is to create an environment that integrates the use of robotics, information technology, and video gaming to develop useful tools for evaluating functional gains and development of rehabilitation programs.

Drs. David Reinkensmeyer and Steve Cramer have developed many useful tools like the Music glove, Robo Trunk, and Hand & Wrist Assisting Robotic Device (HWARD) to facilitate improvement of hand function and trunk stability. In addition, they are utilizing already existing technologies like the Zero G over ground body weight support system (Bioness), a motion caption system (Phasespace), and the Armeo-Spring (Hocoma) virtual reality arm training orthosis to develop and test integrative rehabilitation tools.

One device that is catching the eyes of many is the Music Glove due to it's entertainment appeal as well as it's ease of use as a rehabilitation tool. The Music Glove was developed by biomedical engineering graduate student Nizan Friedman with Prof. Mark Bachman in electrical engineering and Dr. Reinkensmeyer. The Music Glove measures finger tapping to generate musical notes with guidance of a video game interface similar to the popular game GuitarHero. It focuses on restoring dexterity to your fingers to increase one's ability to do things like holding a cup, brushing your teeth, or typing on a computer. This device is a simple and inexpensive way to incorporate motor training of your fingers with feedback while playing music.

As well as focusing on improving hand function, the iMOVE lab has been working with a well designed over-ground system called the Zero G to develop an interactive training environment in which subjects will be performing functional tasks that address both pre-gait and gait skill sets while playing games within a virtual environment. The main goal is to provide a challenging and progressive environment while working on improving balance, stability, and overall ability to walk.

The vision for the iMOVE lab is to be a resource for a variety of disciplines to facilitate their research and progress for the development of more effective clinical rehabilitation tools for our recovery toolbox.

If you are interested in visiting the iMOVE space or learn more about the research currently being conducted, please contact Dr. Dave Reinkensmeyer (dreinken@uci.edu) or Dr. Kelli Sharp (sci@uci.edu).



Each Fall brings one of our favorite and most dynamic fundraising events – the Plymouth Rock N' Run, a 5K run held Thanksgiving morning at beautiful Yorba Linda Regional Park! The Plymouth Rock N' Run is a lot of fun for hundreds of runners, their supporters, and everyone involved. The publicity it generates and donations it raises mean a great deal to the Reeve-Irvine Research Center. All of the funds raised, thousands of dollars each year, are funneled directly into our efforts to advance treatments for people suffering from spinal injuries, neuromuscular disease and neurological disorders.

This Thanksgiving season, we'd like to offer our thanks to the volunteers who pour hundreds of hours into planning and organizing the Rock N' Run. The family and friends of Tim Johnson, the young man who first came up with the idea, and many, many other great folks, put their lives on hold each year to make this run a reality.

This year, we'd especially like to welcome recent Fullerton College graduate Monique Gatillon to our team of volunteer organizers. Monique brings a unique and much needed strength to the team. With her Business Administration background, Monique adds a fresh perspective in attracting support and financial backing from the business community:

"What I like most about Plymouth Rock N' Run, is that it allows me to be creative and apply different concepts and techniques to achieve a marketing goal. As a non-profit, they have funding limitations, so you really have to think outside of the box in order to market to different people. That challenge is very intriguing, and I find myself having fun coming up with new ideas."

One of Monique's ideas was utilizing search engine giant Google: "I applied to be included in Google's non-profit program and got approved. We were offered a variety of programs and applications, which assist us in targeting different marketing channels. For example, under the Google Grant Program, we were able to set-up an ad-words account that advertises on Google's web pages about the upcoming event. This will help bring us more exposure."

We definitely consider that to be a great example of thinking outside the box!

The Plymouth Rock N' Run event is one of several fundraisers held each year under the banner of Research for Cure, a non-profit first organized in Northern California. The Research for Cure Foundation has long been one of Reeve-Irvine Research Center's most important fundraising partners.

The Plymouth Rock N' Run is gaining momentum each year. It's a wonderful opportunity for not just running enthusiasts, but any and all area residents to burn off a lot of calories, literally kicking off the traditional pound packing season.

Look for highlights of the 4th anniversary run on page ten.

Plymouth Rock N' Run



Tania Jope and Monique Gatillon

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**John A. Kessler, Chair of the Dept. Of Neurology,
Northwestern University,
Feinberg School of Medicine
Location TBA on our website.**

RoboTrunk

Moving Therapies into the Future

RoboTrunk is a manual wheelchair with a robotic back that can dynamically support the trunk of individuals with spinal cord injuries. The project is the Master's Thesis project of Christopher Wong in Mechanical Engineering, and came out of a collaboration between Suzy Kim, MD, David Reinkensmeyer, PhD, Kelli Sharp, DPT, and Daisuke Aoyagi, PhD. This team is developing RoboTrunk for three applications.

The first application is to quantify trunk function in regenerative trials. The chair was inspired by the Geron stem cell trial, which is using stem cells with individuals with thoracic injuries. There is a need to find precise ways to measure the hoped-for improvements in trunk function over time for this trial. RoboTrunk can quantify trunk strength, balance, and seated reaching ability. A particularly useful feature is that the device can provide a graded level of trunk support to people who are too weak to sit without support. This allows measurements of trunk and reaching function before a full return of trunk function.

The second application is to use RoboTrunk as a rehabilitation therapy device. The chair can be used as a controller for video games that the user plays by moving the trunk, or the trunk and hand together. The chair can assist in playing the games, or resist if the user has a good recovery of trunk function. Exercising the trunk may improve the benefits of regenerative treatments on trunk function.

The third application of RoboTrunk is as a take-home device to assist people with balance during everyday life activities. RoboTrunk can provide just the right amount of support to allow a person with trunk weakness to lean dynamically when using the arms and hands. This allows a greater range of motion than if the person were using a chair that restricted trunk motion.

The development of RoboTrunk will hopefully improve the characterization and recovery of trunk function after spinal cord injury.



Performing bilateral reach task with support from Robotrunk.



With the aid of Robotrunk, this individual is able to maintain balance

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New researcher in Dr. Leif Havton's lab.



Dr. Harriet Chang

RIRC is pleased to welcome Dr. Huiyi Harriet Chang who has joined Dr. Leif Havton's laboratory at UCI and Reeve-Irvine Research Center as an Assistant Researcher. Dr. Chang comes to us from the University of Pittsburgh. Her predoctoral training was with Dr. William C. de Groat, who is recognized as one of the world leaders in research on neural control of bladder function. Dr. de Groat received the Reeve-Irvine Research medal in 2009 for his fundamental studies in this area. Dr. Chang also trained briefly at Stanford University with Dr. Hsi-Yang Wu to broaden further knowledge on the voiding reflexes in

neonatal rats. She also worked as a Scientist in Allergan to investigate the effect of Botox on the overactive bladder.

Dr. Chang's expertise is in pharmacological modulation of bladder function following spinal cord injury. Her studies focus on rodent models, and the control of a muscle called the external urethral sphincter. To void the bladder in a normal way requires that two physiological actions occur simultaneously. The bladder (which is actually a muscle) has to contract and at the same time, the external urethral sphincter, which is basically a biological valve, has to open. These two actions have to occur in "synergy" (which means together). People who have suffered a spinal cord injury often suffer from a condition called "dys-synergia", in which there is bladder contraction triggered by a full bladder at the same time that the sphincter (the valve) doesn't open. This causes a pathological increase in pressure within the bladder, which pushes urine back up into the kidneys. All of this greatly increases the chances for kidney damage and urinary tract infections. Thus, figuring out how to control the external urethral sphincter is of great importance. During her training at the University of Pittsburgh, Dr. Chang investigated how a neurotransmitter called "serotonin" controlled bladder reflexes. One aspect of her research explored something called urethral sphincter bursting activity, which turns out to be critical for expelling urine.

Dr. Chang joined Dr. Leif Havton's laboratory in 2006 as a postdoctoral fellow, where she further explored the mechanisms underlying voiding reflexes. Of special importance was her work on voiding reflexes after damage to the nerve roots from the spinal cord (a common consequence of injuries at the lower spinal level). This injury is called a ventral root avulsion (VRA), and Dr. Havton has been a leader in studies of how to re-attach the disconnected nerve roots via re-implantation.

Currently, Dr. Chang wishes to establish the foundation for studies of pain mechanisms associated with bladder dysfunction in the VRA injury and repair model, and explore ways to improve voiding efficiency. This brings together two of the most significant problems that people who have suffered SCl identify as their greatest concern—bladder control and pain. Dr. Chang will explore new therapeutic approaches to these problems using pharmacological modulation and artificial electrical stimulation.

Reeve-Irvine Research Center

For questions regarding our educational and scientific programs or general information on the Reeve-Irvine Research Center, please contact:

Kelli Sharp, DPT

sci@uci.edu
949-824-3993

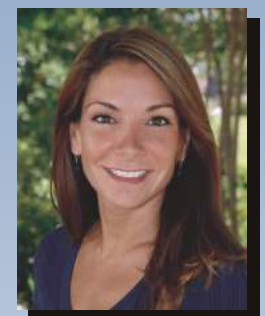


Interested in fundraising or making a donation?

Please contact:

Tania Jope

tania.jope@uci.edu
949-824-5925



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2107 Gillespie Neuroscience Research Facility
Irvine, CA 92697-4265

945-824-5739

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Plymouth Rock N' Run 5-10K Race

Celebrating their 5th year, the Plymouth Rock N' Run 5-10K race announced a record 1600 runners in races on Thanksgiving morning at Yorba Linda Regional Park in Anaheim, CA. This year, they added a 1K run for kids. The event continues to grow in popularity, drawing runners locally, nationally and internationally. It has been called one of the best organized runs in the area.

"It is impressive to see how the entire community pitches in to make the day such a huge success," says Tania Jope of RIRC. "Local high schools, community businesses, parents, interns - everyone works hard to make this event not only run well, but an enjoyable event all around."

Congratulations to Plymouth Rock N' Run and Research for Cure for a job well done. This team is truly an amazing team of volunteers with huge hearts and amazing character!

10K overall winner 40 year old Gray Mahver, originally from Zimbabwe, who held an NAIA title at 5,000m in the early 1990's.

5K overall winner was 19 year old Matt McElroy, who is a resident of Huntington Beach, CA and attends Oklahoma City University(OSU).



Special Thanks to Micah Retz,
Fundraising Coordinator for the Research for Cure Perris Skydiving event.

5th Annual Race for Tara Classic

Racers from all over the country flocked to gorgeous Northstar Resort in Tahoe on September 24th and 25th, for the 5th annual Race for Tara Classic. The event is named for famous downhill mountain biker, Tara Llanes, who was paralyzed from the waist down after a devastating crash while racing in September 2007. Tara Llanes continues to push herself to the limit, racing in the event that bears her name, all the while working with her team of volunteers to coordinate the races.

This year, the Tara Llanes Classic added a new XC race set to test the technical skills of advanced riders. 215 racers signed up for the Mega DH (downhill race) and about 50-60 in the XC, all enjoying ideal mountain conditions for the race. By popular demand, this year's Classic continued the Shamano sponsored kids race with 40 kids, ranging in age from just 2 years old up to 12, geared up, striving to race like the professionals. Reeve-Irvine was proud to represent the Center this year with Dr. Oswald Steward participating in the event along with researcher Dr. Rafer Willenberg.

This year's race proved to be fun for the whole family and spectators alike. "The TLC gets bigger and better every year," Tara said, "and this year was incredible! I can't thank the sponsors enough for their support year after year. I also want to give a mountain of Thank You's to the mountain bike riders who compete in all the events during our race weekend."

All of us at the Reeve-Irvine Research Center are grateful to these amazing volunteers who work hard all year to make this event a success!



Start Line for the Kids 1K race



Volunteer/MC Ron Griffiths and his granddaughter Alyssa Griffiths, the race's turkey mascot, pose with Commander Chuck Street, MC Volunteer



Start of the 5K Race line with close to 1600 runners!

State Record Fundraiser!

The Reeve-Irvine Research Center would like to thank Sky Dive Perris and friends for their 2nd annual sky dive fundraising event, held October 12-16th. This group encourages participants to direct jump proceeds to support research efforts conducted at the Reeve-Irvine Research Center. Last year, this event raised over \$18,000!

The event is managed by our friends at Sky Dive Perris, Fran Lopes from Research for Cure and Micah Retz. This year's event included guest speaker, Dr. Oswald Steward, discussing advances in spinal cord injury research and an amazing video presentation by Succinct Video entitled "PTEN Breakthrough - Spinal Cord Regeneration." The video highlights the collaborative research project between Dr. Zhigang He and Dr. Steward. The fundraiser extended into Saturday evening with a dinner for participants and a live auction had guests bidding for incredible prizes. Everyone involved was extremely dedicated and generous.

Moving forward, Sky Dive Perris plans to keep their Spinal Cord Research Tandem fundraiser active and on-going. The plan allows anyone who would like to make a tandem jump through the SCR fundraiser program the opportunity to do so at anytime. Simply let the folks at Sky Dive Perris know you are jumping for the Research for Cure fundraiser and proceeds from your jump will be donated to support important research efforts at the Reeve-Irvine Research Center.

Surrounding this year's event Sky Dive Perris is building a new California State record. The goal is a total of 200 skydivers in a formation! Help us reach this goal! Jump out of a perfectly good airplane to be part of the state records and raise funds to give hope to those who need it most!



Reeve-Irvine Information Tent.
RIRC Researcher Rafer Willenberg, Tania Jope
and Oswald Steward.



Tara Llanes
Photo by Steven Martin Photography



Tara Llanes Classic Kids Race

Ways to Give....

Since there are a variety of ways one can support the Reeve-Irvine Research Center at the University of California, Irvine, it's important you choose the options that are most appropriate for you. Planned giving enables a donor to arrange charitable contributions in ways that maximize his or her personal objectives while minimizing the after-tax cost. Listed below are just a few ways to send your gift to support the critical spinal cord injury research happening today and in years to come.

Should you have questions or if you would like to receive more information on giving, please contact

Tania Jope

(949) 824-5925 or tania.jope@uci.edu.

Those wishing to make a donation directly may send checks payable to the UCI Foundation/Reeve-Irvine to the address below:

Tania Jope,
Director of Community Development
Reeve-Irvine Research Center
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We would like to say a special thanks to
Shad Davis a personal friend of Roman Reed
for donating his time to update our website!

Thank you Shad!

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New at the RIRC!

Monthly Lab Tours



For more information
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Kelli Sharp, DPT

sci@uci.edu or call (949) 824-5145



Study to understand trunk stability and control.



- Subjects with spinal cord injury will receive trunk stability testing.
- The session will be held in Irvine on the UC Irvine campus.
- Participants will receive **\$10.00** for completing each session.
3 session minimum. 10 session maximum.
- If your SCI occurred **at least 1 year ago** you may be eligible.

All personal information will be kept confidential.

If interested, contact Kelli Sharp, DPT
sci@uci.edu or call (949) 824-5145