step ahead™ Australia
finding a cure for spinal cord injury

NEWS
SPRING 2011

EXECUTIVE DIRECTOR'S REPORT – GEORGE OWEN

Barbara and I have just returned from a fantastic 14 days in which we literally flashed around the world visiting old friends in a sense, those who have been involved with our research program for some years now. Our first stop was Buenos Aires and we were very well looked after by Professor Gustavo Moviglia. Buenos Aires is a lovely city and we had a Sunday to look around. The rest of our time there was occupied by discussions with Gustavo and his team. We visited the hospital, which is a private hospital, very well equipped. It's endowed by some very wealthy people in Buenos Aires and those at the senior administrative level are very keen on supporting Gustavo's work. So much so that they are putting the finishing touches to a state of the art good manufacturing process (GMP) facility for growing human cells. This has been modelled on the Karolinska institute GMP facility in Sweden. It is very much state of the art. We discussed his plans for the next phase of his clinical trial. This would include animal studies but more importantly a phase two clinical trial based on his previous work using activated monocytes and stem cells, combined with a strict rehab protocol over at least a year.

We then moved on to Denver to catch up with Stephen and Janette Davies. It was exciting to see the work they are doing with their astrocytes. These are the same cells he reported on at last year's conference. We are still waiting for the Yale validation study to be finalized. His other work with Decorin is equally promising. From our perspective we can't get to a clinical trial using these two components quick enough.

Next was the long haul over to Milan were Angelo Vescovi was gracious enough to break into his summer holiday and show us around the facilities at the Hospital as well as the labs where Fabrizio Gelain is working. The Hospital, built by Mussolini is huge. They describe it as a city within a city. It is being restored and soon to be completed are new laboratories where Fabrizio will consolidate his current labs. When we were in Argentina we meet one of Fabrizio's scientists who was introducing Gustavo's team to the use of his matrix bridges in animal models. So it was good to see the two working together. In Rome we visited another institute directed by Angelo. This was the Mendal Institute. Here he is able to test the gene expression of cells and in particular the stem cells that we may want to use. Later that day we were driven to Turni where he has been growing fetal cells donated after spontaneous abortion. These are the cells that he will be using for a clinical trial for ALS. He received final approval for this whilst we were there.

Our final call was to Bangkok. It was great to meet up with Prof Maiyadhaj Samsen on his home turf. He is the Director of the Prasat Neurological Institute. He has been the key person in bringing together a number of Hospitals and Institutes in the city. This is a great achievement and testament to his skill and commitment. We saw his Institute and two hospitals that have research interests. The most immediate area in which we can work together is in the treatment of spinally injured or diseased dogs. As you know, we have a project here in Australia with the Melbourne University Veterinary School to treat dogs with spinal paralysis. In Bangkok there is a large Veterinary Hospital that is treating paralysed dogs with surgery, just as we are doing here. The problem is that surgery is not enough, so the plan is to now introduce cells and matrix. Much is to be done but you can see how we have here and around the world, elements being developed in order to make it happen. Through the ethical treatment of injured dogs we will learn a lot about how to apply these elements of treatment to a human clinical trial.

The November conference in Melbourne will see all of the team from around the world discuss over the two days how we can put this all together. You are invited to this conference but hurry as we expect keen interest and have limited space. See the web site for further details.

Mr George Owen
Executive Director, SAA

RESEARCH UPDATES

I. Application of de-cellularized matrix for spinal cord injury

Drs. Livesey and Traianedes have been continuing their histological examination of their initial implants. Preliminary data indicates a profound affect of their matrix in inhibiting the inflammatory response following SCI, an important finding as inflammation is one of the factors that can contribute to a multitude of mechanisms that inhibit repair. Importantly, the dermal matrix is also vascularized, repopulated with cells and a cellular continuum is seen between the implant and host composed of blood vessels and cells. These data suggest the dermal implant is integrating with the host spinal cord. The next series of animals will be implanted under the guidance of veterinarian neurosurgeon Sam Long and analysis performed over a 6-month time span.

II. The use of bio-inspired smart matrices and electrospun fibers for SCI repair

Since beginning their project in March the Gelain/Vescovi team have concluded their search to find a post-doctoral fellow who will undertake the required experimentation. Subsequent to an extensive search they felt they had found the appropriate person, however, after several delays from this individual we went back to our applicant pool and hired another top-ranked scientist. While this process has set them back several months, with the right person in place, the project should move along quickly.
A new post-doctoral fellow is scheduled to go to visit Dr. Moviglia's lab to train them in the techniques of implanting electrospun fibers and self-assembling peptides. A second hired, Dr.Vasita, from the Indian Institute of Technology has just begun working on the project and is being trained in the required methods and techniques. Meanwhile, Dr. Gelain has reconnected with his former lab located in the ISN at MIT and they will provide them with new microguidance channels to be used by Dr. Moviglia. The next newsletter should have results from the preliminary implants done in Argentina.

III. Independent confirmation of therapeutic effects of transplanted astrocytes derived from glial-restricted precursors, GDAs(BMP) in the injured rat spinal cord

i. Establishing the injury model and behavioural test in Dr. Kocsis' Laboratory:

Members of the Davies lab have been working with the Kocsis group and have trained them in behavioural analysis. A pilot set of animals has been tested post-surgery and behavioural results indicated that both groups are getting consistent results. This is an important step as it establishes baseline conditions for the replication experiments.

ii. Establishing a protocol for precursor cell shipment, culture and differentiation in Dr. Kocsis' Laboratory:

Dr. Christoph Proschel, University of Rochester, and Ms. Karen Lankford (Kocsis Laboratory) have been working together for several months to coordinate the shipment of glial restricted precursor cells (GRPs) from Rochester, NY to West Haven, CT, and the culturing and differentiation of these cells into GDAs^{BMP} in the Kocsis Laboratory. Protocols have been exchanged and test samples of the GRPs have been sent and successfully cultured by Ms. Lankford.

iii. Verification experiment:

The experiment to test the ability of GDAs^{BMP} to promote recovery of locomotor function after transplantation to acute spinal cord injuries has been initiated. Following the Davies Laboratory published protocols, rats that have been trained to cross the horizontal ladder / gridwalk, randomized into two experimental groups, injured and one group treated with an intra-spinal injection of GDAs^{BMP}, the other treated with an intra-spinal injection of the cell suspension media (vehicle control) only. Two observers from the Kocsis laboratory, blinded to the treatment groups, will assess the ability of the rats to cross the horizontal ladder at 3, 7, 10, 14, 21, and 28 days post injury / transplantation.

We are eagerly anticipating the preliminary results from these experiments in the next few weeks.

We will provide further updates in our next newsletter.

7TH ANNUAL SCIENTIFIC CONFERENCE 2011

By now I am sure you are all aware that our Annual Scientific Conference is to be held on Wednesday 30th November, 2011 and Thursday 1st December, 2011. The conference will be held at The Education Centre, 3rd Floor, Healy Wing, St Vincents Hospital, 41 Victoria Parade, Fitzroy, Victoria, Australia, 3065.

We have put together a comprehensive group of scientists and clinicians again this year, including Dr Angelo Vescovi PhD. and Dr Doug Fields PhD among others.

Whilst there is no fee for attendance, those wishing to attend are encouraged to register due to limited seating availability and for catering purposes. Any enquiries can be directed to Mrs Sally Piening at spiening@stepahead.org.au or to Mr Brent Reynolds at breynolds@stepahead.org.au