



Ontario Centres of
Excellence

Where Next Happens

ONTARIO CENTRES OF EXCELLENCE *DISCOVERY 2011 STORY ABSTRACTS*

► ***Surgical perfection takes lots of practice – LifeLike BioTissue***

Every student of surgery needs plenty of practice before taking their skill into the field. But attracting volunteers willing to take a practice shot in the arm (or worse) can be a real challenge. And, while using cadavers or dead animals is the norm, they simply can't compare to the intricacies of living human tissue.

Thanks to a creation by University of Western Ontario researcher, Dr. Leonardo Millon and with the help of the Ontario Centres of Excellence (OCE), surgical training has taken a giant leap forward.

Dr. Millon, in partnership with his entrepreneurial sister, Karen Million – a graduate of the Richard Ivey School of Business – started LifeLike BioTissue . The award-winning company creates synthetic tissues that look, feel and behave like human tissue. They help training surgeons achieve a higher level of skill, confidence and expertise.

Dr. Leonardo Millon of LifeLike BioTissue (www.lifelikebiotissue.com) can discuss the challenges associated with surgical training today. How are advances in synthetic tissues offering a cost effective and easily acquired alternative to traditional surgical training methods? How can patients and hospitals benefit? What other advances may be on the horizon in synthetic tissue development?

► ***Can gaming work in the classroom? – Spongelab Interactive***

With video games so entrenched in youth culture why not harness that appeal for the classroom, and instead of blasting aliens, use it to get students excited about science?

With enrolment in the sciences continuing to fall, Toronto-based Spongelab Interactive, with support from the Ontario Centres of Excellence (OCE), saw an opportunity to take science from the uninspired two-dimensional to a 3D interactive, highly visual world of learning that uses the gaming skills that today's youth know so well.

Products like Spongelab Interactive's GDL and the recently released *History of Biology* are helping teachers connect to their students in a fresh new way, allowing them to work through different levels and challenges to literally watch science come to life cell by cell.

Dr. Jeremy Friedberg, co-founder of award-winning Spongelab Interactive (www.spongelab.com) is available to discuss a unique approach to learning. How are teachers using this technology? What results are being seen in the classroom? How can these tools be integrated into the curriculum to inspire and drive learning in science?



► ***Taking a bite out of healthcare costs – P&P Optica***

If you've ever needed blood tests you know the drill: Take your requisition to the nearest lab, roll up your sleeve and donate vial upon vial of the red stuff, wait a few days and visit your doctor for the results. It's time consuming and expensive to the healthcare system. Surely there's a better way...

With assistance from the Ontario Centres of Excellence (OCE), P&P Optica's innovative optical spectrometer technology is helping to reduce the cost of routine blood tests by up to 70%. At a time of an over-burdened system with costs spiralling out of control, this technology offers substantial savings that can be used to reduce the load in other areas of healthcare.

P&P's technology can be used in doctors' offices, clinics and emergency rooms where near-instant blood analysis is an advantage or even a necessity. It eliminates the need for expensive chemicals previously required to identify target substance such as iron, glucose and cholesterol.

For individuals completion of routine blood tests is accelerated, repeat visits to labs and clinics are reduced, and actions to resolve issues can begin more expeditiously.

Olga Pawluczyk, president of award-winning P&P Optica (www.ppo.ca) is available to discuss how chemical compounds in blood are analyzed using light. What benefits can it bring to the healthcare system and to individuals? How does this technology differ from other approaches to blood analysis? What other applications are on the horizon?

► ***Tracking pandemic possibilities in real time – Bio.Diaspora***

International air travel is a part of life for hundreds of millions of people worldwide. And while air travel brings with it many exciting opportunities, it has also brought with it an interconnectedness that has caused fears for global health in the wake of pandemics such as SARS.

Founded by Dr. Kamran Khan and developed through St. Michael's Hospital in Toronto, Bio.Diaspora is a scientific project dedicated to understanding the impact increased international travel has on global health. The project developed an easy-to-use, web-based information application that analyzes the relationship between commercial air travel and the global spread of infectious diseases.

This project has already accurately predicted how the H1N1 virus would spread worldwide after arising in Mexico in early 2009. It was also used to assess global infectious disease threats during the 2010 Vancouver Winter Games, the World Cup and the Hajj. It also was used to evaluate the potential for international spread of measles out of New Zealand and cholera out of Haiti after earthquakes affected those two countries.

Bio.Diaspora is helping bring understanding to how infectious diseases spread through commercial airline travel and allowing countries to prepare appropriately for these potential threats. Dr. Kamran Khan is the founder of Bio.Diaspora (www.biodiaspora.com) and is available to answer questions about the application.



► ***Slapshot robot designed to discover why hockey sticks break – Hockey Robotics***

No matter which hockey team you cheer for, there is nothing more exciting than watching your favourite player wind up to take the big shot in a clutch situation. And there is nothing more disappointing than watching his stick break when he makes contact with the puck.

With the introduction of composite sticks to hockey, watching multiple \$250 hockey sticks turning to kindling on the ice every night is becoming more and more commonplace at all levels of the sport. While there has been much speculation as to why, no one has been able to figure out how to get to the root of the problem until now.

The Hockey Robotics team at the University of Waterloo have created the SlapShot XT, a dynamic hockey stick robot capable of delivering a slap shot at up to 110 mph. They will use this robot to test composite hockey sticks to gather never seen before data in order to analyse what happens to hockey sticks during the slap shot. This data will then be used to correct the problems inherent in composite hockey sticks.

By learning what makes composite sticks fail so unexpectedly, the Hockey Robotics team hopes to help the casual player save money by not having to buy multiple sticks a year and help professionals keep their level of play high.

JS Rancourt is the Business Development, Industry Relations & Funding Lead at Hockey robotics (www.hockeyrobotics.com) and is available to discuss the future of the SlapShot XT.

► ***Picture your mind in real time and in 3D - Cerebral Diagnostics***

The human brain has long been a mystery for neuroscientists and psychiatrists alike. Even today, understanding of the body's most complex organ is lacking.

Thanks to the work of two Toronto doctors, this could soon change. Cerebral Diagnostics, led by Dr. Mark Doidge and Dr. Joseph Mocanu, has developed software that creates dynamic, real-time, three-dimensional colour movies of the brain using an electroencephalograph (EEG).

Using an algorithm known as eLORETA, the software amplifies EEG signals from 32 electrodes attached to the cerebral cortex and converts them into colour-coded movies of the brain's activity. The movie can be watched in real time, recorded and played back on computer screens. Cerebral Diagnostic's invention, dynamic electrical cortical imaging (DECI), improves on current imaging technologies that take pictures only once every few seconds by taking visual impressions less than 1/1,000 of a second apart, making it faster than any other imager used today.

Ultimately the technology could aid in the diagnosis and treatment of pain, sleep and other behavioural disorders, as well as neurological diseases and dementias. While the software is proven, its application to medical treatment has yet to be clinically tested in traditional, double-blind studies.

Dr. Doidge, President of Cerebral Diagnostics Canada Inc., (www.cerebraldiagnosics.com) is available to discuss the potential of the software for the future of neuroscience.



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► ***Solving the world's traffic congestion – Miovision Technologies***

Anyone who drives knows that roads are getting busier, more difficult to maintain and more dangerous. Traffic congestion is having a huge impact on the environment, fuel consumption and the lives of commuters around the globe.

With assistance from Ontario Centres of Excellence (OCE), Miovision Technologies Inc. and its research partners at the University of Waterloo have developed a technology that makes transportation networks smarter by developing a tool that lets cities easily collect the complex, high quality traffic data needed to improve traffic flow. The data is then used to optimize traffic signals to reduce idling time, facilitate better urban and suburban planning, and improve roadways and intersections. In four years the firm has gone from the idea stage to a company with more than 200 clients in 18 countries around the world.

Miovision is currently poised at another growth stage and is recruiting another 25-30 people by the end of this year to help satisfy the needs and opportunities of the market. They are hiring software and hardware developers, project management specialists and driven and talented individuals. The benefits of Miovision's technology are felt by everyone: by reducing idling times at intersections, fuel consumption is reduced in turn reducing the impact driving has on the environment, travel times are shortened which reduces traffic, and improvements are made in road safety.

Kurtis McBride, CEO of Miovision (www.miovision.com) is available to discuss how Miovision's data collection technology outperforms traditional traffic data collection methods. How can this technology improve traffic flow and efficiency? How can we address our congestion and pollution problems by making improvements to our current infrastructure?

► ***Efficient and cost-effective solar panels - Morgan Solar***

Going green by installing solar panels is a good way for individuals and businesses to save money. However, many people and businesses hesitate to install them because of the initial costs of buying and setting up solar panels on their homes offices.

Morgan Solar, working with the University of Ottawa and with the support of the Ontario Centres of Excellence (OCE) has designed a solar panel that solves the cost problem and is poised to revolutionize the industry. The Toronto-based start-up's solar panel is called Sun Simba. It is durable, costs less to make, is lighter, easier to put together and is 100 per cent more efficient than traditional solar panels.

Sun Simba is made through injected moulded plastics, a fast and economic manufacturing technique. No toxic or exotic materials are used and all materials are 100% recyclable. Building factories to create the panels is fast, easy and inexpensive, passing on even more savings to the consumer.

Morgan Solar's revolutionary Sun Simba Solar panels could soon be in demand around the world. With successful testing completed in labs in Toronto, Ottawa and Denver, Morgan Solar currently has a panel assembly line at its headquarters in Toronto. The company is also planning a 200 KW demonstration system in California this year that will power a water pump that irrigates a nearby soccer field.

Nicolas Morgan is VP of Business Development at Morgan Solar (www.morgansolar.com) and is available to discuss Sun Simba's design. What makes Sun Simba different than other solar panels? How is it so efficient? When will it be available for widespread distribution?