



IRANZ Connections.

Supporting Innovative Functional Food Exports

Cawthron Institute is providing expertise to award-winning functional food ingredient developers Seperex Nutritionals to support their launch of their new bioactive marine extract product BioLex^{RM} into the world marketplace.

Seperex's innovative anti-inflammatory extract is derived from New Zealand Greenshell mussel. Seperex Chief Scientific Officer, Andrew Sansom says "Cawthron proved to be the ideal partner because of their expertise with Greenshell mussels and their analytical capability for quantifying the bioactive lipids in BioLex^{RM}. We needed to measure the precise quantity of the bioactives, initially for product development and then for ongoing quality control. We had to be confident that the analysis could stand up to international scrutiny. The validity and reliability of the data obtained gave us the confidence we needed to launch the product overseas."

Cawthron Laboratory Services provides customised analytical solutions to clients through its specialised method development team. In the case of Seperex, Cawthron used LC-MS technology and staff expertise to quantify bioactive lipids and developed a method that is now available on a routine basis for the company. "Cawthron's investment in cutting-edge instrumentation combined with their expertise and customer responsiveness, have been key factors in the success of this project to date."

www.cawthron.org.nz



Image courtesy of Wayne Barrar

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Aqualinc's Wheel of Water

The Ministry of Science and Innovation has awarded Aqualinc Research Ltd \$700,000 a year for three years to develop a framework that has the potential to transform land and water resource users into water managers, through a collaborative process.

Aqualinc researchers will develop a 'water wheel' visual tool and process for water users to individually and collectively understand how their decisions impact on overall water quantity and quality.

Water users can use the water wheel framework to set agreed catchment limits for water allocation and quality, balancing cultural, economic and social values, and outcomes.

www.aqualinc.co.nz

New Manager for Lincoln Ventures Groundwater Quality and Management

Lincoln Ventures has appointed Hugh Canard as Groundwater Quality and Management team leader. Hugh has a diverse background in building services engineering, tourism, business management, and economic development. He brings a long term interest in water management to this role, having been involved in water conservation issues, the Canterbury Water Management Strategy, and as a member of the Land and Water Forum Small Group. On a personal level Hugh is a keen kayaker and has paddled most of New Zealand's rivers and a few major rivers such as the Colorado Grand Canyon.



HUGH CANARD

"Water seems to have been a continuing theme in my life," Hugh says. "This position is a good fit with my personal interest in contributing to improved water management in New Zealand, as the Lincoln Ventures team is engaged in research to understand ground water processes and supply tools and models for the effective management of groundwater quality and allocation."

"Our work is of vital importance because the upcoming mandating of limits and national standards on water quality will require better understanding of the transfer of nutrients in complex groundwater systems". Future water management will demand that communities meet targets for sustainable land use and water quality. "Lincoln Ventures wants to be a key contributor to the knowledge base that enables the wise use of water."

Lincoln Ventures researchers are located in Waikato and Canterbury.

www.lvl.co.nz

Conference links Metals Research and Industry with the Market

Heavy Engineering Research Association (HERA) is the traditional force behind the organisation of the biannual Metals New Zealand Industry Conference which links research and industry development interests. However, this year's conference in April launched Metals New Zealand as a new sector-overarching body giving a voice to the metals-based industry of New Zealand.

The metals engineering industry is worth over \$7.3 billion each year with around 30% exported. This accounts for 5.5% of New Zealand's exports. The majority of New Zealand's steel and aluminium exports are in high-value manufacturing niches in diverse areas such as super yachts and machinery, steel frames for houses, milking carousels, gas compressors, desalination plants, and drying kilns for timber. Up until now, the metals industry's achievements and potential has been little recognised as the industry has been a quiet achiever lacking a unified voice, mainly due to its spread across a wide range of sectors.



NOEL DAVIES (CHAIRMAN, METALS NEW ZEALAND), HON DAVID CARTER AND DR WOLFGANG SCHOLZ (HERA DIRECTOR) AT THE METALS NZ INDUSTRY CONFERENCE

Under the theme of "Driving Productivity and Innovation", the conference aimed to drive industry development by linking industry stakeholders from manufacturers to R&D providers to representatives of target markets. The metals industry sector organisations and organisational members of Metals NZ such as Steel Construction New Zealand, National Association of Steel Framed Housing, NZ Stainless Steel Development Association, Lights Alloy Manufacturing Association and their common core research association, HERA, ran their own sessions within the conference.

www.hera.org.nz www.metals.org.nz

Upgrading BRANZ's research and testing capabilities

BRANZ recently completed the third stage of five of its \$11.4m campus refurbishment. This is the most significant upgrade in its 37 years at the 5ha Judgeford site near Porirua, and was desperately overdue.

The interior of existing buildings, which contain workshops, laboratories and administration areas, are currently being reconfigured and modernised.

Facilities for research and testing have been improved and expanded, which includes updating and optimising laboratory and workshop spaces. Flexible and more functional working environments was a priority, which now enables staff to cater for large-scale wall tests through to testing small materials. In addition, a workshop has been created to cater for accelerated weathering of materials in temperature and humidity-controlled environments.

Other refurbishment priorities for the campus were improved ventilation and air-conditioning within specific laboratories, to provide comfortable working conditions, Secure access to all laboratories, and better access and facilities to deal with sample deliveries, including better doorways, roller doors and hoists.

Each refurbishment stage has been structured so that key equipment can be relocated for minimum productivity loss, and the ongoing research programme has been virtually unaffected; a tribute to the staff's commitment to their industry.

In addition to the refurbishment, a new building has been constructed and integrated into the development using Structural Timber Innovation Company (STIC) principles. BRANZ is a shareholder in the STIC research consortium, and the world-leading building technology that it is developing plays well to New Zealand's strengths.

The whole refurbishment is expected to be completed in February 2012.

www.branz.co.nz

Nano-leathers create novel market opportunities

A Ministry of Science and Innovation-funded project investigating novel property improvement on leather is providing some exciting results. The New Zealand Leather & Shoe Research Association Inc. (LASRA®) has identified fire resistance, on-demand sanitisation, chemical resistance, abrasion resistance and comfort enhancement as important properties for leather safety footwear, upholstery, clothing and gloving products. Applications for protective leather with these properties include cold-store footwear with in-built thermal buffering, firefighter's boots with radiant heat, flame, water and chemical resistance, combined with anti-bacterial properties.

LASRA's laboratories have investigated the ability of a number of novel nano and micro-particle sized reagents, obtained both commercially and manufactured in-house

to improve these leather properties. The challenge of achieving uniform distribution of these reagents on the leather substrate, particularly in a wet-chemical process, has shaped the project, but also provided wider insight into the best method of application of these nano and micro-materials to leather. Product development is constant, as exemplified by the recent development of footwear leather capable of meeting the radiant heat barrier test for firefighter's boots.

Successfully combining properties into a range of individual leather applications will be the goal for the final year of development, along with securing both intellectual property and suitable partners within New Zealand to take these products to market.

www.lasra.co.nz

BELOW: NANO-REAGENT PROTECTED, WATER RESISTANT, LEATHER STRIPS DEVELOPED AT LASRA® MAINTAIN INFLAMMABILITY WHILE RETAINING FLEXIBILITY AFTER 3 MINUTES EXPOSURE AT 1200°C.



Safer, Stronger, and Longer Lasting Road Surfaces

Opus Central Laboratories in Lower Hutt is one of a few laboratories worldwide that delves into the complex science and engineering that goes into road building and maintenance. The little stones that make up about 95% of the road surface play an extremely important role in road safety. "Previous research has shown that the type of stone is important for how quickly the road wears out. Now our scientists are looking at new ways to compact and orient the stones to provide not only the best surface skid resistance but also increased strength overall", says Ian Wells Principal Science Advisor.

Phil Herrington, Pavements Scientist, says that "by having a more fundamental understanding of the packing behaviour and interaction of the granular aggregate particles, a compaction, recycling and material selection system can be developed

that will allow us to manipulate granular pavements to carry increased loads. We use a technique of 3D x-ray scanning to look under the road surface and then we use advanced computer modelling to understand what is happening. By approaching the problem from an interaction of discrete elements perspective rather than one of solid mechanics, we are now able to determine the best structure for a given use."

Mr Wells says "manipulating established aggregate crushing methods to change particle shapes, is practically very difficult. So to improve the ability for industry take-up, the current focus is optimising existing compaction methods to achieve the required packing structure and development of a special stabiliser to increase strength, particularly of recycled materials."

www.opus.co.nz

Recovery from earthquake

Opus scientists studying social and economic recovery from major disasters have had to revise planned research in Christchurch after the magnitude 6.1 aftershock in February 2011. Following the Christchurch earthquake in September 2010, Opus Central Laboratories initiated three case study projects: a questionnaire investigating earthquake impact on Christchurch's Central Business District (CBD) commercial activity; investigation of pedestrian footfall counts as an indicator for CBD business recovery; and a longitudinal study of population migration from, to, and within the Canterbury region.

Dr Felicity Powell of Opus Central Laboratories says "the substantial damage in the CBD and the cordon put in place after February's earthquake has meant that our planned research for central Christchurch is currently on hold. We anticipate that work will recommence on these projects later in the year, though there may need to be some modification to their original scope."

Dr Powell presented the initial findings from the pedestrian indicator project at the 2011 conferences of the New Zealand Planning Institute and the New Zealand Society for Earthquake Engineering. Reports on population migration following the earthquakes are posted on the Earthquake information portal of Statistics New Zealand.

www.opus.co.nz



CRL Energy finalist in Wellington Gold Awards

CRL Energy was a finalist in the May 2011 Wellington Gold Awards for Business Excellence in the "Discovering Gold" category for R&D projects. CRL Energy entered their gasifier and associated hydrogen technologies package and achieved a place in the top five out of 15 other entries in the category.

The gasifier technology package has been a significant research focus at CRL Energy's Lower Hutt lab for over six years. The company has successfully built a pilot 200kw fluidised-bed gasifier which utilises New Zealand's vast lignite resource together with renewable wood stock as a coal/ biomass feedstock to produce a syngas. The gasifier will now be integrated with a high efficiency electrolyser stack built by research partner Industrial Research Limited, using renewable electricity to produce oxygen to increase the gasifier efficiency, and hydrogen to enrich the syngas stream.

"The gasifier can be either air or oxygen blown. When oxygen is used, it is supplied from the electrolyser which can take advantage of intermittent low cost

renewable electricity from wind. The oxygen and hydrogen produced can store the electrical energy. The package can be coupled with carbon capture and storage to reduce any associated emissions," says Dr Tana Levi, lead scientist on the project.

CRL Energy has incorporated other value-added enhancements such as a desulphurisation tower, a water gas shift reactor, and gas compressor. "We can use the syngas we create to make chemicals, low-fossil-carbon transport fuels, or high-value peaking electricity. The syngas has also been fed through a palladium-based membrane to produce ultra-clean hydrogen that can be converted into electricity in a fuel cell. Hydrogen can fuel zero-emission cars," says Dr Levi.

This pilot has attracted international attention, with both national and international clients using the plant for trialling fuels for gasification and a whole range of downstream equipment and processes for gas treatment and purification.

www.crl.co.nz



DESULPHURISATION TOWER

CRL Energy opens new office in Westport

At the end of June, CRL Energy has opened new premises in Westport offering coal technology and mine geology services for operations in the Buller region.

CEO Dr Rob Whitney says, "the coal industry is booming on the West Coast of New Zealand through strong international demand for its high quality coking and thermal coals. There are a significant number of new developments planned in the Buller and other West Coast coalfields". CRL Energy provides services ranging from geological assessments and advice, testing including coal preparation studies on coal washery parameters, spontaneous combustion, methane drainage and rock reactivity, to research on upgrading coal properties and advanced coal conversion technologies. The Buller office will be CRL Energy's shop front for these services in the Westport region.

The contact details for CRL Energy's new Buller Office are CRL Energy, 25 Palmerston Street, PO Box 321, Westport. Tel: +64 3 789 7289 Fax: +64 3 789 7489 Email: Buller@crl.co.nz

www.crl.co.nz

TiDA joins IRANZ

IRANZ welcomed the Titanium Industry Development Association (TiDA) into its membership in July. Established in 2009, TiDA's key role is to introduce titanium powder technology and resources to wider New Zealand industry. New Zealand's titanium alloy powder applications industry is in its infancy but could rapidly grow into a billion dollar export industry given the right support and encouragement. With access to ground-breaking technology and resources, and the most up-to-date scientific data, TiDA undertakes contract research, product development and quality control testing to help New Zealand companies take advantage of the vast opportunities titanium has to offer. The Applied Powder Metallurgy Centre and TiDA's head office is based in Tauranga.

www.tida.co.nz



Who we are:

IRANZ is an association of independent research organisations. Its members undertake scientific research, development or technology transfer. Members include Aqualinc Research Ltd, BRANZ, Cawthron Institute, CRL Energy Ltd, Heavy Engineering Research Association (HERA), Leather & Shoe Research Association (LASRA), Lincoln Ventures Ltd, Opus Central Laboratories, Titanium Industry Development Association (TiDA) and Transport Engineering Research NZ Ltd (TERNZ).

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