1. The HORYZONS Project: Online recovery for youth onset psychosis [IBES]

Summary
Psychosis represents a major crisis in the lives of patients and their families. Although clinical remission is obtained in the majority of cases, unfortunately 80% of patients will experience a relapse within 5 years of the initial episode. For a young person relapse means disconnecting with school, work, friends and their community. It also dramatically increases their risk of developing chronic psychosis, permanent disability and homelessness. Our group has pioneered effective early interventions to prevent relapse; however they are not readily available to most patients. We aim to develop an online tool for relapse prevention that will be readily available and accessible to a large proportion of young people with psychosis. By preventing relapse we hope to allow many young people to remain engaged and connected with their friends, work, school and community and to reduce the disabling effects of psychosis.

2. Nano-crystal laser interferometry microneurography for diagnosis and therapeutic evaluation [MMI/MNI]
   James Brock*, John Furness – Anatomy & Cell Biology; Stan Skafidas, Electrical & Electronic Engineering.

Summary
This project is developing a new non-invasive method to monitor the electrical activity of sensory nerve endings at the surface of the body that could be used clinically. Work to date has focussed on developing the sensor, which is a crystal which responds to very small electrical currents with an alteration in its structure; a change that is detected with a laser. To trial this nano-crystal laser interferometer we will record electrical activity from cold sensitive sensory nerve terminals in the cornea of the eye. Preliminary to these experiments we have been using conventional recording methods and mathematical modelling to predict the electrical currents in the immediate vicinity of the crystal. We predict the nano-crystal laser interferometer will detect signals that cannot be resolved with conventional methods.

3. Electromagnetic brain imaging using parallelized finite element models in Epilepsy [VLSCI]
   Anthony Burkitt*, David Grayden, Leigh Johnston – Electrical & Electronic Engineering; John Wagner – IBM Collaboratory (VLSCI); Mark Cook – Clinical Neuroscience; Jens Haueisen, University of Ilmenau, Germany.

Summary
A major challenge in planning and performing surgery for drug-resistant epilepsy is the accurate identification of where in the brain the seizures are being generated. The current state-of-the-art method is to temporarily implant electrodes directly on or in the brain. Our goal is to non-invasively localise seizure-generating brain regions by using the BlueGene computer to compute the location from recordings made by external electrodes. This project will develop the software needed to do this and draws together experts in mathematics, engineering, brain imaging, high-performance computing and clinical neurology. The availability of the software will enable and catalyse research in this area.

4. A comprehensive environmental assessment model: informing environmental decision-making across disciplines [MEI]
   Robert Crawford*, Leigh Glover – Architecture, Building & Planning; Lu Aye, Civil & Environmental Engineering; Kerry Hinton – Electrical & Electronic Engineering; David Jones – Chemistry.

Summary
Knowledge of the impacts that human activities have on the environment is of growing importance and the ability to identify these is critical for achieving significant environmental improvement. Current approaches for quantifying these impacts are insufficient for providing the level of detail and information needed to make the best and most informed decisions. This project will develop a tool that provides a much clearer view of the indirect consumption of the natural resources and emissions associated with any product, system or process. This will provide the information needed to inform the design and development, comparison and selection of appropriate and optimal solutions for reducing environmental impacts across a broad range of disciplines.

5. Synthetic mimics for bio-film adhesion: Unifying concepts on a molecular scale [MMI]
   Raymond Dagastine* – Chemical & Biomolecular Engineering, Richard Wetherbee – Botany.

Summary
Resolving the mysteries of polymer physics for both synthetic and biological polymers has led to amazing leaps in our understanding by literally, physically unraveling these polymers. This project employs the approaches developed to probe the origins of the strength of spider silk and bio-adhesives to discover new insights into the molecular structure and function of polymer–surfactant complexes. Previously, the research team has focused on biological polymers in bio-film formation. This project focuses polymer–surfactant complexes as an approach to better understand bio-film formation through links to these unique synthetic systems with similar adhesive behaviors.
6. Medical Clinical Telediagnosis using high-definition 3D visualisation and remote telemetry [IBES]

Ian Everall*, Ramon Mocellin – Psychiatry; Ken Clarke – Electrical & Electronic Engineering; Dirk van der Knijff – Information Technology Systems; Andrew Stranieri – University of Ballarat; Chris Myers, Ann Borda – VERSI; David Ryan – Grampians Health; Brett Rosolen – AArnet.

Summary
The introduction of the National Broadband Network will allow the introduction of innovative high bandwidth network applications. With this in mind we are developing a small-scale proof-of-concept test facility for hardware and software to be used in the tele-diagnosis and –assessment, of, for example, patients in rural and remote locations based upon high-resolution/definition (HD) 3D technology. Our experimental trials will inform further models for larger-scale projects to roll-out to rural and remote hospitals and health care facilities, as well as provide a model for tele-diagnosis within hospital settings and physiological parameter telemetry from the patient’s home e.g. heart and blood pressure monitoring via high bandwidth mobile telephony and/or optical fibre internet networks.

7. Urban placemaking; social equity and cultural diversity [MSSI/SE]

Ruth Fincher* – Resource Management & Geography; Maree Pardy – Philosophy, Anthropology & Social Inquiry; Kate Shaw – Architecture, Building & Planning.

Summary
Place making is the practice of producing local built environments so that they reflect particular social meanings. In contemporary settings this is largely design driven. Placemaking requires critical examination to judge whether it incorporates issues of social equity and cultural diversity. This project investigates placemaking in three ways. It: (i) traces the emergence and use of the term; (ii) interviews key advocates of placemaking in Victoria, to establish the relation between design/development and social sustainability; (iii) evaluates urban placemaking projects to illuminate their social equity dimensions. The project will add to contemporary placemaking programs in Victoria, and the international scholarly literature.

8. Biomechanical testing of wildtype and mutant mouse cartilage by atomic force spectroscopy [Bio21]

Amanda Fosang*, Fraser Rogerson – Paediatrics; Peter Lee – Mechanical Engineering; Xuehua Zhang – Chemical Biomolecular Engineering.

Summary
Arthritis affects millions of Australians and is the major cause of disability in this country. A defining feature of arthritis is cartilage erosion and loss from joints; we have studied the genes involved in this process in genetically modified mice. In this collaboration between the Departments of Paediatrics and The Faculty of Engineering, we are using Atomic Force Microscopy to measure changes in the physical properties of mutant mouse cartilage at a nanoscale level that is too subtle to measure by other techniques. This study will allow us to correlate changes in molecular properties with the biomaterial properties of cartilage, to provide information on which mutations confer the best protection against cartilage erosion in arthritic disease. The results will help identify the best molecular targets for the design of new arthritis therapies.

9. TRIGEN: A holistic approach for optimized usage of heating, cooling and electricity for bulk energy users [ME]

Saman Halgamuge*, Harry Watson – Mechanical Engineering; Robert Crawford, Che Biggs – Architecture, Building & Planning; Muthupandan Ashokkumar – Chemistry; Suki Maheswararajah – Melbourne School of Land & Environment.

Summary
Hospitals, hotels, universities and data centres, etc. are considered as bulk energy consumers with the need to use electricity, heating and air conditioning simultaneously. Conventionally electricity generated in thermal power plants are around 30% efficient and the remaining 70% of energy is released into the environment as waste heat. The main idea of triple generation or trigen systems is to recover this waste heat into useful heating or cooling purposes while generating electricity. Recovery of waste heat contributes to reduction of CO2 emissions by saving fossil fuel which could have been used otherwise for cooling or heating. Optimum operation of such plants can maximize the benefit of triple generation systems.

10. Intimate partner violence and women’s economic security across the lifecourse [SE]

Cathy Humphreys* – Social Work; Marion Frere – McCaughey Centre; Kelsey Hegarty – General Practice; Miranda Stewart – Melbourne Law School; Stuart Ross – Social & Political Sciences.

Summary
This interdisciplinary study aims to: a) explore the consequences of intimate partner violence for women and their dependent children in relation to pathways to employment, experiences of employment, and social and economic security across the lifecourse; b) determine the best way to conceptualise and operationalise the links between intimate partner violence and economic security over the lifecourse. Interviews with women about their experiences provide the basis for a larger research study.

11. High resolution monitoring of atmospheric pollutants to identify their impact on population health [IBES]


Summary
Air pollution is a major cause for many population health issues, such as asthma, bronchitis and chronic obstructive pulmonary disease (COPD). According to the World Health Organization more than 4.6 million people die annually from the direct impact of air pollution. This project aims to use the modern sensing devices, the smart-metering infrastructure and broadband communication technologies to perform pollution monitoring at a higher spatial and...
temporal resolution than that is performed today, to understand and manage the impacts of air pollution on population health.

12. Climate knowledge and sustainable lifestyle: A preliminary examination of cultural dynamics or climate change

Yashihiisa Kashima*, Daniel Little – Psychological Sciences; Allie Gallant, David Karoly, Peter Rayner – Earth Science; Angela Paladino – Management & Marketing.

Summary
Disagreement over climate change is becoming increasingly polarized, despite an international consensus among over 97% of active climatologists that human activity is a significant contributor to global warming (Doran & Zimmerman, 2009). There are many factors underlying this disagreement (economic, political, religious, etc), the most fundamental of which is how people understand the scientific models of climate. Do people have the cognitive capacity to intuitively grasp the long-term consequences of climate change? As a first step toward answering these questions, we use a novel computer task to determine how people learn about realistic climate systems with delays and accumulating feedback.

13. Shared Prosperity: A road map


Summary
Senior Australian economists have expressed deep concerns about the loss of the economic reform imperative associated with the 1980s and 90s. Key issues are Australia’s declining productivity as long-term good of the country. In this context our research team has developed a Policy Roundtable process in partnership with researchers of the Business Council of Australia and the Australian Council of Trade Unions which is designed to produce a new Inclusive Growth model for Australia. Key deliverables will be a popular format ‘Shared Prosperity Policy Road Map’ together with a book based on the research papers.

14. Novel hybrid diamond-metal oxides for advanced electro-optic applications

Snjezana Tomiljene-Hanic*, Brant Gibson, Stefania Castelletto, Andrew Greentree – Physics; Anthony Morfa, Matthias Karg – Chemistry (Bio21)

Summary
This project combines diamond research within School of Physics and the extensive material research of metal oxide thin-films at the Nanoscience Laboratory within Bio21/School of Chemistry. We have had promising preliminary results and the results we have obtained so far are of interest to the wide research community. We expect that these results will lead to the publication of high-impact papers in peer-reviewed journals as well as presentations at national and international conferences. These extremely exciting preliminary results provide an outstanding springboard for future applications for the external funding.

15. Magnetic resonance and optical imaging to study the dynamics of neural stem cell responses in situ using nanodiamonds

Ann Turnley* – Centre for Neuroscience; Tobias Merson – Florey Neuroscience Institutes; Stefania Castelletto – Physics.

Summary
Current techniques to investigate the mechanisms of stem cell-mediated repair of neural tissue are limited to analysis of post-mortem tissue. This project aims to develop a method of real time, non-invasive whole animal imaging to assess the migration of endogenous neural stem cells. This research is focusing on investigating the use of nanodiamonds to label endogenous neural stem cells for magnetic resonance and optical imaging. The primary aim is to exploit nanodiamond particles to study the dynamics of cellular behaviour. The eventual aim is to determine how endogenous neural stem cells migrate, differentiate and integrate into the brain in the course of a regenerative response to neural damage.

16. Development of free radicals as therapeutic agents for cardiometabolic syndrome

Carl Schiesser* – Chemistry; James Ziegas, Christine Wright – Pharmacology.

Summary
Hypertension is the world’s third largest cause of death. Free radical and reactive oxygen species (ROS) generation are a consequence of the activation of the Angiotensin Type 1 (AT1) receptor involved in blood pressure regulation. Inflammatory responses triggered by ROS further exacerbate the hypertensive condition.

Our interdisciplinary team has developed Nitrasartan as a novel cardioprotective AT1 receptor antagonist and antioxidant that exhibits dual actions in vitro and in vivo. Nitrasartan may provide a novel therapeutic treatment that targets both the oxidative stress and angiotensin II components of cardiovascular diseases using one drug and has the potential to improve the health and welfare of a significant proportion of the population.

17. Towards the development of a biofuels roadmap for Australia

Gerd Bossinger* – Forestry & Ecosystem Science; Gregory Martin – Chemical & Biomolecular Engineering; Isabel Moller – Botany.

Summary
To date there has been limited emphasis on bio-ethanol production from second generation feedstocks derived from local natural and agricultural resources in Australia. This project aims to identify novel non-food feedstocks from local plant resources in Victoria and explore their suitability for efficient bio-ethanol production. In our approach, conversion technologies are combined with novel high-throughput methods in carbohydrate analysis to gain knowledge of biomass components and their behavior during pretreatment. Our results will help to determine ideal industrial processing conditions for biofuel production from novel feedstocks and inform the potential development of a local biofuels industry.
18. Bacteria – living sponges for waste water purification [MMI]
Michelle Gee*, Huabin Wang, Spas Kolev – Chemistry; Richard Strugnell – Microbiology.
Summary
Wastewater from industries such as mining and electroplating is a serious environmental problem. It can contain toxic and carcinogenic heavy metal ions such as lead, zinc, arsenic or copper ions and often ends up in soil and contaminates ground water. Even domestic water with high concentrations of calcium or magnesium (heavy water) leads to over consumption of household detergents that pollute our waterways. It is important from the perspectives of both water conservation and pollution control that wastewater is collected and heavy metal ions removed so that water can be safely reused or returned to the environment. The aim of this proposal is to develop bacterial colonies as living ion sponges for the removal of heavy metal toxins from waste-water.

19. TELIA: Technology for endangered languages in Australasia [BES]
Summary
Australia and its geographic region are home to about 2,000 languages, many of which are endangered. Our goal is to develop scalable methods for preserving and accessing large quantities of oral literature in as many languages as possible. This pilot project is exploring semi-automatic methods for segmenting speech and song, to enable efficient creation of media-aligned transcriptions and translations. We are investigating user interface designs for deploying this software on smartphones, and using them to collect endangered language data in dozens of languages in the highlands of Papua New Guinea.

20. Wireless strain gauges for implant dentistry: Towards the bionic bone sensor [MMI]
Joseph Palamara*, Janice Kan, Roy Judge – Dental School; Andrew Greentree – Physics.
Summary
The dental implant industry is approximately $1B per year. Early identification of potential implant failure is paramount to longevity and restoration of function, aesthetics and patient outcome. Bone quality analyses by strain gauge determination will lead to long-term monitoring and timely intervention should complications arise. This research targets the development of a small (millimeter) diamond-based implantable wireless bone strain gauge device for implant placement. A wireless solution is essential for long-term operation and human applications. It is apparent that a wireless, biocompatible strain gauge will have extensive potential for a range of prostheses in addition to needs of implant dentistry.

21. The Uma Mutin (White House) Timor Leste project (I – Archival contextualization) [IC]
Robyn Sloggett* – Centre for Cultural Materials Conservation; Lyndon Ormond-Parker, Marcia Langton – Centre for Health & Society; Nick Thieberger – Linguistics & Applied Linguistics; Colin Ferguson – Business & Economics; Neco Sarmento – external.
Summary
There is a wealth of archival material held in institutions in Australia that records the history and culture of Timor Leste. This project is developing methods using digital, multi-media and web-based formats by which this archival material can be most effectively made accessible to those Timorese to whom it has relevance. Supported by a group of experts at the University, by institutions and Indigenous partners in Australia, and through links with organisations and communities in Timor Leste, this project will establish tangible community-focused mechanisms for preserving and sharing documents pertaining to the national and regional history and culture through a sustainable framework of international standard technical and curatorial solutions.

22. New approaches to probing the onset of polycyclic aromatic hydrocarbon formation in flames [MEI]
Gabriel da Silva* – Chemical & Biomolecular Engineering; Richard O’Hair – Chemistry (Bio21).
Summary
Soot particles are one of the major pollutants associated with fossil fuel combustion. These particles are toxic, contribute to urban smog, and even play a role in global warming. Soot particles form from polycyclic aromatic hydrocarbon (PAH) molecules, which are produced in flames when aromatic free radicals react with other hydrocarbons. Because these free radicals are highly reactive, they have proven difficult to study using conventional techniques, and as a result much of the chemistry that contributes to soot formation in flames remains unknown. We have developed a novel approach for investigating these reactions, applying ion trap mass spectrometry to radical ions that serve as analogues for known combustion free radicals. Using this technique, coupled with theoretical calculations, we have been able to reveal new information about important chemical reactions that lead to soot formation.

23. Nanowire biosensors for the next generation of high throughput screening devices [MMI]
Lloyd Hollenberg* – Physics; Stan Skafidas – Electrical & Electronic Engineering; Steven Petrou – Centre for Neuroscience.
Summary
Nano sensing is primed to open new frontiers in our understanding of neuronal functional in health and disease. Our goal is to exploit recent advances in silicon nanowires and diamond/nitrogen-vacancy detectors to create high temporal and spatial resolution sensor technology. For the silicon nanowires project we have begun the design/specification phase for the development of a nano voltage sensor (the nanovolt) and a nano voltage-clamp sensor (the nanoclamp). For a system based on atomic level...
24. Adapting the Chesapeake Bay Game for improved water and environment management in Australia [MSSI]
Andrew Hamilton*, Margaret Ayre, Ruth Nettle – Land & Environment; John Langford, Graham Moore, Andrew Western – Engineering; Gerry Learmonth – University of Virginia; Graham Steed – GR Steed & Associates; John Feebairn – Business & Economics; Chris Arnott – external.

Summary
Water allocation between the competing demands of agriculture and the environment in the Murray Darling Basin (MDB) is a particularly sensitive and divisive issue. The University of Virginia (UVa) has developed a complex and innovative simulation model that demonstrates the effects of decisions by all members of the Chesapeake Bay community on Bay health and crab production. Originally developed as a game for teaching UVa students about the range of interactions that effect Bay health, the model is now being refined for use by water managers, governments and policy makers.

UVa and The University of Melbourne have developed plans to adapt the Chesapeake Bay model for key Australian water environments. The project will be a social learning and modelling exercise used to test the effects of farming, policy and government decisions on components and people of the MDB and will result in more effective social learning and water management strategies in key Australian catchments.

Dominic Ng* – Biochemistry & Molecular Biology; Spencer Williams – Chemistry; Clive May, Coleen Thomas – Neurobiology (Florey Neuroscience Institute); Owen Woodman – Medical Sciences (RMIT)

Summary
Cardiovascular disease, including heart attacks and stroke, remains the leading cause of adult disability and death worldwide despite improved surgical techniques. To date, there are no drugs available for clinical use. A big reason for this is that we do not fully understand the disease at the molecular level. In this project, we will use an interdisciplinary approach to reveal new protein drug targets of high disease significance. Our innovative approach, which brings together expertise in large animal physiology, medicinal chemistry, pharmacology and protein biochemistry, will provide fundamental knowledge that will drive future rational drug design and new clinical treatments to combat cardiovascular disease.

26. Future transport scenarios [MEI]
Chris Manzie* – Mechanical Engineering; Peter Scales, Greg Martin – Chemical & Biomolecular Engineering; Robert Crawford, Leigh Glover – Architecture, Building & Planning; Patrick Herps – Earth Science.

Summary
Partial or total electrification of vehicles is widely seen as inevitable to counter the effects of greenhouse gas emissions and heavy reliance on the exhausting oil reserves. The aim of this project is to investigate the economic viability and environmental implications of electric vehicles in Australia.

To conduct these investigations, computer models of the vehicles with different levels of electrification have been developed. Under some realistic assumptions, these models predict the energy consumption and emission associated with various electric vehicle variants for the Australian driving conditions. The knowledge gained through these simulations will be used to perform the net-present value analysis to establish the most cost-effective vehicle configuration over the vehicle lifetime under different scenarios of inflations in fuel and electricity prices.

27. Worldviews and networked knowledge: How youth in diasporas learn and live through the web [SE]
Fazal Rizvi* – Melbourne Graduate School of Education; Nikos Papastergiadis – Culture & Communication; Frank Vetere – Information Systems.

Summary
The growing use of web-based technologies has transformed the ways in which people now communicate with each other across national borders, potentially altering the sense they have of social relations, belonging and citizenship. This project aims to understand the multiple ways migrant youth in Australia make of new communication technologies, and explore how their transnational experiences affect the ways they negotiate the cultural dynamics of social institutions such as schools.

Following an interdisciplinary survey of theoretical literature addressing these issues, the project attempts case studies of three migrant youth communities, drawing out their implications for social and educational policies and practices.

28. Victorian Aboriginal youth and their use of new technologies: Exploring online social networks to enhance educational outcomes [IBES]
Phillip Morrissey*, Odette Kelada, Fran Edmonds – Culture & Communication; Rachel Nordlinger – Language & Linguistics; Jenny Waycott – Education Technology (MDHS); Lisa Watts – Centre for Indigenous Education.

Summary
By seeking to understand the capacity for social network technologies via mobile phones to support community and cultural connections, this study aims to investigate how and why Aboriginal youth use new technologies and the potential for these to improve educational and social equity outcomes. By including a multidisciplinary approach this collaborative project will involve researchers, the Aboriginal community and the Department of Education and Early
Childhood Development to develop a project that will provide further evidence for the use of mobile technologies, which are inclusive of Aboriginal cultural protocols and enhance opportunities for Indigenous youth to complete a secondary education.

29. Institutional resilience in bushfire prone areas: Learning from experience [MSSI]


Summary

The project examines the development and application of new knowledge in communities after a disaster event, aiming for greater levels of long-term resilience. While considerable attention has been paid to vulnerability in disaster settings, less attention is paid to change mechanisms affecting resilience. In particular, the institutional practices of local services and governance require further study in terms of the ways that they go on to develop strategies for increased resilience after a disaster event. Using the case of a community that was affected by the 2009 Victorian Bushfires, the study develops key factors affecting resilience.

30. Temporary migrant work and contested notions of social justice [SE]

Joo-Cheong Tham* – Melbourne Law School; Martina Boese, Kate Macdonald – Social & Political Sciences; Michael McGann – Philosophy; Winsome Roberts – Social Work.

Summary

Australia has witnessed a rapid increase in temporary migrant workers. As these workers become increasingly significant, pressing questions arise: What rights and obligations should these workers have? What principles should govern their treatment in Australia?

This project takes up these questions by examining the relationship between social justice and temporary migrant work in Australia. With a focus on the principles of choice/autonomy and fairness/equality, it examines the understandings of social justice that inform governmental and philosophical justifications for temporary migrant work schemes. Using the Victorian nursing sector as a case study, it also seeks to distil the notions of social justice that temporary migrant nurses bring to bear on their experiences. The project will draw together these different understandings to provide an integrated account of social justice and temporary migrant work in Australia.


David Simpson*, Brant Gibson – Physics; Yan Yan, Angus Johnston – Chemical & Biomolecular Engineering.

Summary

This interdisciplinary project seeking to explore the role nanodiamonds have to play in nano medicine and cell biology has progressed well in the initial stages of investigation. The team has conducted a comprehensive study on the material properties of nanodiamonds resulting in biocompatible fluorescence probes suitable for quantum sensing and therapeutic delivery over a size range of 15-100nm. Initial intracellular studies of these novel nanodiamonds have begun with the successful demonstration of 3D and rotational tracking over long time scales (hours). The team is about to embark on an exciting series of trials to investigate the complex interactions between nanodiamonds and cellular environments, which will lead to realization of novel quantum probes for cell biology and therapeutic vesicles for drug delivery.

32. Anticipation of epileptic seizures using electrical probing of the cortex [MNI]

David Grayden*, Jonathan Manton – Electrical & Electronic Engineering; Mark Cook, Wendy d’Souza – Medicine (St Vincent’s Hospital)

Summary

About 30% of epilepsy patients have uncontrolled seizures. For these people, seizure onset is unpredictable, severely impairing quality of life. Although seizure occurrence appears to be random, there is evidence that the brain undergoes subtle changes prior to seizures. Our goal is to develop a system that is able to anticipate seizures before they occur by electrically stimulating the brain and monitoring the resulting activity using electrodes. This project is contributing to that goal by preparing an extensive database of electrical recordings obtained from the brains of patients to reliably predict the pattern of electrical events before seizures.

33. NIR Phototherapy and BioImaging – Linking novel materials to therapy [Bio21]

Paul Mulvaney – Chemistry; Kevin Barnham – Pathology; Ken Ghiggino, Paul Donnelly – Chemistry (Bio21); Andrew Kay, Stanley Styli – Melbourne Hospital.

Summary

Pathologists in the UM medical faculty, surgeons at RMH and chemists at Bio21 will develop a new NIR imaging capability and materials for phototherapy and cell imaging. The research team will target neurodegenerative diseases, cancer cell labeling and tumour therapies. The new instrumentation will enable the above teams to work together to get proof of principle experiments done and to show the potential of NIR imaging. We expect to demonstrate in 2011 cell uptake and imaging of NIR compounds and materials. We would aim to demonstrate that these materials can be excited or tracked in animal models.

34. Digital China: a qualitative assessment of innovative broadband narrative construction and on-line research-reporting models in key mainland Chinese media universities and research centres [IBES, AS, IC]

Ian Long* – Film & Television; Ken Clarke – Electrical & Electronic Engineering; Du Liping, Yuxing Zhou – Asia Institute; Josko Petkovic – Murdoch University.

Summary

The project develops research undertaken throughout China over three months in 2011. Face-to-face interviews have been conducted with forty five leading professors, government officials and researchers in seventeen key
institutions involved in digital media documentation and education. The project investigates Chinese new media education in relation to establishing quality benchmarks for the development of audio-visual enhanced scientific research reporting models. It also seeks to identify key international exchange and development opportunities between the University of Melbourne and selected Chinese universities involved in screen training and new media education.

35. The F-AsTex: a new tool for measurement of tactile discrimination in the foot

Kimberley Miller*, Mary Galea – Physiotherapy; Peter Lee – Mechanical Engineering; Richard MacIsaac – Endocrine Centre (Austin Health & The University of Melbourne).

Summary

Loss of foot sensation is an important factor contributing to disability in conditions such as diabetes. Screening and quantifying sensation impairment is important for diagnosis and treatment. Our multidisciplinary team has developed a prototype for assessment of foot sensation (the F-AsTex) based on the AsTex®, a clinical device with established reliability and sensitivity for hand sensation assessment. The F-AsTex prototype incorporates the capacity to quantify texture discrimination and pressure through the foot. Work is currently underway to refine assessment procedures and to evaluate the clinical utility of the F-AsTex for the assessment of foot sensation in people with diabetes.

36. New therapeutic approaches to minimize brain damage following trauma: Synthetic cobalt complexes for the controlled up-regulation of the neuro-protective protein Ndfip1

Paul Donnelly* – Chemistry (Bio21); Seong-Seng Tan – Melbourne Neuroscience Institute and Howard Florey Institute.

Summary

Brain injury from trauma is a major health issue in Australia. Each year, about 3,000 patients are admitted to hospital with traumatic brain injury. Traumatic brain injury (TBI) initiates a complicated cascade of molecular events that result in neuro-degeneration, with some of the effects occurring up to 12 hours after the initial trauma. The delivery of metal ions using cell membrane-permeable metal complexes represents a method for activating cellular pathways. This project utilizes metal ion complexes capable of initiating the selective up-regulation of neuro-protective proteins, with the goal of developing innovative therapeutic approaches to minimize long-term physical, behavioural and cognitive deficits following head trauma.

INTERDISCIPLINARY SEED FUNDING SCHEME : SUCCESSFUL PROJECTS 2010

1. The biophysical basis of absence epilepsy [MNI]
3. Social Accountability for Sustainable Development [MSSI]
4. Limits of resilience: integrating empirical research with theory [MSSI]
5. Screen Stories and Community Connections [IBES]
6. Soluble fibre for increased gut health [Bio21]
7. Affective and neuropharmacological modulation of decision-making neural networks [MNI]
8. Rapid environmental detection of Legionella [MMI]
9. Human nutrition and biofortification – can micronutrient dense crops make an impact? [Bio21]
10. Making Pathology Reports Smarter by Incorporating User Characteristics in Design [IBES]
11. MUtopia – A Collaborative-Interdisciplinary Platform For Visualisation, Simulation And Testing Innovative Ideas Of Future Sustainable Urban Development [MSSI, MEI]
13. Climate Change, Energy and Justice in East Timor [MEI, SE]
14. A triple bottom line review of the BER initiative [MSSI]
15. Nanoparticle Mucosal Vaccines [MSSI]
16. Electroactive polymer foams for medical bionics [MMI]
17. Chemical, biological and quantum optical approaches for interfacing with neuronal cultures and brain slices [MNI, MMI, VLSCI]
18. Membrane recognition of antimicrobial peptides [Bio21]
19. Magnetic resonance and optical imaging to study the dynamics of neural stem cell responses in situ using nanodiamonds [MNI, MMI]
20. Mobile and Broadband Technologies for Ameliorating Social Isolation in Older People [IBES]
21. Living poor in contemporary Australia: the social recognition of poverty and disadvantaged neighbourhoods [SE]
22. Estimation of parameters in multi-wave stochastic disease transmission models [VLSCI]
23. Transnational Diasporic Chinese Mediascape in Australia: A Post-Olympic Perspective [AS]