



## Bio21 Institute Update

A quarterly review of highlights and news

Issue 2, June 2009



### **Message from the Interim Director, Professor Tony Bacic.**

Today's economic challenges highlight the need for organisations to re-align and streamline operations to ensure efficiencies. In the last quarter, the Institute's senior management focused on evaluating our operations in line with the Faculty of Science and wider University review. This, coupled with long term strategic and business plans developed for the next round of University budgeting, provide a strong basis for our continued growth that builds on the Institute's existing research strengths and capabilities. Notwithstanding the pending budgetary outcomes, our commitment to develop our capability in key platform technologies continues. From a collective of funding sources, a \$1m upgrade has been made to our 600 MHz NMR spectrometer which will enhance research output for many of our facility users. The ongoing development of our mass spectrometry, proteomics and peptide synthesis capability also continues with the purchase of a new Agilent ESI-TOF mass spectrometer. The recruitment of high level technical experts (Professional Officers) to manage key platforms is also important and we are pleased to have Dr Nicholas Williamson join our team as facility manager. We are also working closely with Professor Peter Rathjen's new strategic infrastructure committee to identify key technology platforms for the Parkville Precinct and how these would be funded.

Our focus on industry and research partnerships has also evolved. We farewell Bruker Daltonics who for more than two years at Bio21, have expanded their operations and moved on to larger premises. In turn, we welcome Tecniplast Aust Pty Ltd, the Australian subsidiary of Tecniplast S.p.A who develop both terrestrial and aquatic environments, laminar flow, wash and automation technologies for the animal science community throughout Australia and New Zealand. To complement our existing Electron Microscopy (EM) unit, we also welcome the Department of Pathology's EM Unit. The core facility of the Faculty of Medicine, Dentistry and Health Sciences, the team focuses on conventional electron microscopy in the biological, medical and diagnostics fields and complements the broader scope of the Bio21 EM unit.

The diversity of the groups who visit the Institute allow us to share the important role biotechnology and science as a whole have in society. Ranging from high level international delegates to wide-eyed budding young scientists, our purpose is single-minded to inspire and inform them of the important role we play for delivering useful outcomes for the future.

In sharing these and the many highlights you will read about below, there is a milestone event that I wish to recognise which defines the caliber of our research community and are the moments we pause to celebrate. On behalf of Bio21 colleagues, congratulations to Professor Andrew Holmes who was recently appointed a University of Melbourne Laureate Professor. Andrew's work and leading role in his field and contribution to Bio21, the University and scientific community, both here and abroad, are testimony to the recognition he well deserves.

Looking forward, we await the outcomes of the University's budgetary process and confirmation of our business plans for supporting our long term growth and operations. We also will be engaged in an audit conducted by the Victorian Auditor-General's Office which will focus on realising the benefits of State Government investments in biotechnology using the Bio21 Institute and the Synchrotron, key flagship investments of the program, as models. A busy time ahead. Tony



### **Congratulations to organic chemist Professor Andrew Holmes, newly appointed University of Melbourne Laureate Professor.**

Among the many honours in a distinguished career, Professor Andrew Holmes has been appointed a prestigious University of Melbourne Laureate Professorship. Recognising his significant contribution and achievements in research and leadership, the appointment is testimony to a distinguished career in science. ARC Federation Fellow and Inaugural VESKI Fellow, Andrew was elected a Fellow of the Australian Academy of Science in 2006, made a Member of the Order of Australia in 2004, and was elected as a Fellow of the Australian Academy of Technological Sciences and Engineering. Andrew's research specialties are synthetic organic chemistry, electroactive polymers and he is well recognized for his contributions to the synthesis of biologically important natural products and for pioneering work on semiconducting conjugated polymers. His materials chemistry research interests have been in the areas of flat panel displays, photovoltaics, field effect transistors, and supercritical carbon dioxide as a benign solvent. The Holmes group is part of a consortium which has produced cheap, paper-thin, organic solar cells, currently undergoing production trials with industry leader Securrency International and featured in a segment of ABC's Catalyst program. [Read more](#) about the Holmes group.

**Enhancing our technology capability with up to \$1m upgrade to Institute's 600 MHz NMR.** The Institute's 600 MHz solution NMR spectrometer has been upgraded costing approximately \$1million with the addition of an Avance III Spectrometer with TCI cryoprobe and autosampler. The enhancement allows multiple samples, providing for metabolomic research; increased sensitivity for carbon and proton; and new pulse sequences being implemented to allow shorter experiments and higher throughput. Funds for the upgrade were contributed by Rowden White Trust, Australian Research Council – Linkage Infrastructure Equipment and Facilities, DVC (Research), Bio21 Institute, Biochemistry and Molecular Biology, Dental Science and Metabolomics Australia. The potential applications for the upgraded 600 MHz NMR include research into protein structure, function and dynamics, metabolomics, natural products and carbohydrates. Read more about the Institute's [NMR facility](#).



**A combined tooth-venom arsenal revealed as key to Komodo Dragon's hunting strategy.** An international team led by Dr Bryan Fry from the Department of Biochemistry and Molecular Biology at Bio21 Institute have revealed in a new study that the effectiveness of the Komodo Dragon bite is due to a combination of highly specialized serrated teeth and venom not because their prey die from septicemia arising from toxic bacteria living in the dragon's mouth. The work has been published in the journal 'Proceedings of the National Academy of Sciences', June 2, 2009 vol. 106 no. 22 8969-8974 [Available online](#). To read the full story, go to the [Media Release](#), 19 May 2009.

**Tentacles of venom: new study reveals all octopuses are venomous.** Dr Fry made news again with a recent study that shows that all octopuses and cuttlefish, and some squid are venomous. The work indicates that they all share a common, ancient venomous ancestor and highlights new avenues for drug discovery. Working with scientists from University of Brussels and Museum Victoria, the work was published in the Journal of Molecular Evolution. Read the [Media Release](#), 15 April 2009.



**Up close and personal.** Professor Frances Separovic is the profiled Biophysicist in the April edition of Biophysical Society. Frances explains her 'atypical' path to becoming a biophysical chemist and Professor in the School of Chemistry. She talks of her passion as a scientist, educator, biological solid-state Nuclear Magnetic Resonance (NMR) spectroscopy pioneer and tireless promoter of women in science. [Read the article](#), copy courtesy of Biophysical Society Newsletter, April 2009 p.p. 6-7. [Read more](#) about the Separovic group's research.

**Outreach – Careers in Biotechnology.** The Institute and its members are committed to engaging our broader community by sharing our stories and experiences and touring our facilities. Throughout the last quarter, the Institute hosted visits ranging from a second University of Third Age (U3A) group from the City of Port Phillip (in conjunction with the Gene and Nano Technology Information Service), high school students interested in finding out more about careers in biotechnology and US students seeking to expand their knowledge to help create global connections. Programs included a 'Women in Science Careers in Biotechnology' forum for approximately 60 female students; tours of our facilities and briefings from our researchers.



**International delegations visit Bio21.** The Institute was pleased to host two significant VIP delegations in recent months – the Chilean Minister for Innovation and Economy with the Ambassador to Chile, and the Malaysian Minister for Science, Technology and Innovation. Both delegations, expressed a keen interest in finding out more about our purpose, innovative approach and potential for linkages. The opportunity to showcase our people and their work was also a clear highlight for our guests including meeting two Malaysian postgraduate students currently undertaking studies at Bio21 as part of the CRC for Oral Health Sciences.

**Funds for new route to treatment of chronic inflammatory disease.** Professor Paul Gleeson, Department of Biochemistry and Microbiology at Bio21 Institute, in partnership with Professor Jenny Stow from the Institute of Molecular Biology, University of Queensland and industry partner, CSL Ltd, was recently awarded an Australian Research Council (ARC) linkage grant. ARC funding is \$336,000 over three years, and the grant will allow a study aimed at developing a new generation of treatments for inflammatory diseases, like rheumatoid arthritis and inflammatory bowel disease. Such diseases are incurable, requiring life-long treatment, and the global incidence of chronic inflammatory disease has a substantial impact on society and the economy. "Our research has already discovered key regulators involved in the export of pro-inflammatory cytokines that play a major role in the development of the disease, and so represent important targets for therapy," says Professor Gleeson. "Highly effective new treatments may be developed that involve blocking the export of pro-inflammatory cytokines by activated immune cells". ARC Linkage grants are a collaborative partnership bringing together research and industry. Their combined efforts allow for better translation of research into outcomes. [Read more](#) about the Gleeson group's research.