asmr Australian Society for Medical Research newsletter

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Get Certified in E-Health

The Health Informatics Society of Australia (HISA), Australasian College of Health Informatics (ACHI) and the Health Information Management Association of Australia (HIMAA) announce the Certified Health Informatician Australasia (CHIA) program.

Health informatics is now almost universally recognised as an integral set of skills underpinning almost every aspect of modern healthcare. Experts are recommending that all medical students be taught the fundamentals of health informatics and e-health during their undergraduate degrees, but what about those who have already entered the workforce?

Many people have made careers in health informatics without ever knowing it. They are self-trained experts in e-health, telehealth, mHealth, electronic health records, or health information management. They are clinicians, information managers, program directors, training directors, business analysts, technology officers, privacy officers, security specialists, services directors, change managers, project coordinators, and data managers. These people haven't studied health informatics formally, but have a breadth and depth of knowledge that is invaluable to the institutions in which they work. The new CHIA program will address the lack of formal recognition of health informatics skills for these people in the Australian health workforce.

In this era of health reform and enthusiasm for e-health, it's important to remember that we need to lay the proper foundations in order for these programs to be effective. E-health isn't a magic cure for the health system's woes, but properly qualified health informaticians just might be. Engaging clinicians and health informaticians early in the business case, design, implementation and evaluation of e-health initiatives has proven positive outcomes, yet too often we continue to see these initiatives treated as 'IT projects' that don't have health informatician involvement. That is a mistake, according to HISA CEO Dr Louise Schaper.

"As Australia's peak body for health informatics and e-health, I hear from institutions and individuals alike complaining either of a lack of skilled workers or a lack of job opportunities. What is desperately needed to help address this issue is training and recognition of health informatics knowledge and skills for those already part of the health workforce."

Dr Louise Schaper,
CEO Health Informatics Society of Australia

The CHIA program, launched this year at Health Informatics Conference 2013 in Adelaide by ACHI, HIMAA and HISA, has been specifically designed to address the looming health IT skills shortage in Australia. Participation in the program will be via directed self-learning, successful completion of the program will require the applicant to pass an exam. Candidates must have an undergraduate degree plus experience in health informatics and associated health fields such as administration/management, clinical information systems, e-health or information systems. The program is suitable for all professional health informaticians, including but not limited to, clinicians, allied health professionals, health information managers, nurses and ICT professionals. The certification program has been developed by a committee composed of representatives from HISA, HIMAA and ACHI and includes leaders in health informatics academia and the health and IT sector.

The core competencies for health informatics that are tested in the exam have been developed with reference

In this issue:

The Australian Society for Medical Research

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to similar work by the American Medical Informatics Association, the International Medical Informatics Association and COACH, Canada's Health Informatics Association, and builds on the previous work done by the Australian Health Informatics Education Council. The learning streams for the Australian program are ICT, health sciences, information sciences, management sciences, human and social context, and core principals and methods.

It's the hope of HISA, ACHI and HIMAA that this program will continue to make a valuable contribution to the healthcare sector into the future by providing a certification scheme that enables employers to ensure candidates have a complete and current understanding of the latest health informatics knowledge and skills. The program will allow candidates to have confidence in their skill set, distinguish themselves from their peers, demonstrate commitment to their profession, and increase the profile of health informatics in Australia.

Technology and methods for health informatics are changing quickly and constantly. This program will enable health informaticians and e-health professionals to maintain a current qualification and certification of their skills throughout their careers.

For more information about the CHIA program please visit www.chia.org.au

The Importance of Science Communication

Dr Paul Willis, Director, Royal Institution of Australia (RIAus)

Do you know which is bigger, an electron or an atom? Did humans walk the earth with dinosaurs? How long does it take for the Earth to go around the Sun?

As a professional science communicator for most of my working life, I don't care if you don't know the answers to any or all of these questions (which by the way are 'atom', 'no'[1] and 'one year'[2]). This is little more than science trivia and yet for many people in the science communication game, this sort of knowledge is the measure of 'Science Literacy'. It's also the kind of information that makes up the bulk of science communications; celebrations of the wonders of science that are generally only appealing to those who already engage with science.

I think there is a much more important lesson to spread about science; its methodology or rather the art of rational thinking. What constitutes reliable evidence? How do you test a proposition? How do you construct a logical argument?

I think that this is a useful thinking tool kit that can equip people with a powerful way to make decisions in their daily lives. The key word here is 'relevant'. If we can show the relevance of scientific thinking to the lives of people who don't normally think of themselves as in anyway scientifically inclined (and that is the majority of Australians) then they are more likely to appreciate it and use it.

And with so many of the pressing problems confronting our fellow citizens that are based in scientific concepts, we need them to be able to access those ideas and interact with them in the most constructive ways possible so that we as a society will come up with the most practical and positive responses to those problems.

Take Climate Change for example. This issue has the potential to cripple the lives of our grandchildren and the severity of its effects in the future depends on decisions we make as a society today. It's not important that everyone understands what the readings from weather stations and ice cores actually mean or that everybody has a working knowledge of how climate change operates. What is important is that everyone realises the scope and impacts of the situation that we face and that there are benefits in acting now, or rather there are enormous costs in the future of not acting now.

It's the same with population. Or energy use. Or water management. Or a host of other broad issues that are underpinned by science. It's not important that people know the science but it's crucial that everyone recognises what the science predicts will happen with these issues and that there are clear choices to be made to improve the outcomes.

There is also a need to appreciate new and emerging technologies but from the same working perspective of understanding their relevance to everyday life rather than an appreciation of the science behind the issue. Take genetic engineering or nanotechnology or photonics. These are technologies that make it possible to improve our futures when wisely deployed. And people will make the right decisions on these issues when they have access to relevant information on how this will impact them personally.

So that's what I see as being the most important feature of science communication. It's not the celebration of this weird and wonderful universe we live in. It's the provision of relevant, practical information and the rational thinking habits to make sense of it. And that's the challenge for the 21st Century for all of us who claim to be science communicators.

1 Unless you take the technical stance that birds are dinosaurs and therefore we have always had dinosaurs for company

2 Another technical glitch; not 365 days and 366 days in a leap year. Technically every year is 365.25 days

Trans-Disciplinary Research Addresses The Big Questions

Associate Professor Terry Piva,
RMIT University
and President MEPSA

In 2014, the Australian Health and Medical Research Congress will explore how trans-disciplinary research can address new treatments for chronic diseases. Since 2002, the Congress has partnered with over 80 professional societies with the view to share knowledge and foster new collaborations. As trans-disciplinary research is in essence 'team science' a broad interest meeting, such as the AHMRC, is the ideal vehicle for bringing likeminded people together to discuss the big research questions. AHMRC also allows for smaller societies, such as MEPSA (Molecular and Experimental Pathology Society of Australasia), to participate as a full member and incorporate their annual scientific meeting under the umbrella of the AHMRC itself. MEPSA has been part of the AHMRC meetings since 2004 and has used the meetings to invite numerous world reknown research scientists that would not be possible at its own conferences. MEPSA has run numerous joint symposia with other societies on topics of common interest. As a result of our participation at AHMRC, we have seen a gradual increase in membership as well as research linkages between our members and those from other societies. Such interactions are crucial in a small country like Australia where research funding is never easy to obtain.

A highly relevant example of trans-disciplinary research can be seen with sunscreens. Australia has the inglorious reputation as the skin cancer capital of the World with over 450,000 cases of skin cancer recorded annually. Sunscreens play an important role in reducing exposure to Ultraviolet (UV) light when they are in the sun. Most sunscreen formulations are comprised of organic molecules which are effective at blocking UVB radiation but less so UVA radiation. Both zinc oxide and titanium dioxide can block UVA radiation and as such these are now being added to sunscreen formulations to confer greater UVA protection to the user. In order to make the sunscreens more appealing to the consumer, these metal oxides have been added to these formulations as nanoparticles. While these nanoparticles confer greater protection to the user against exposure to sunlights, some have raised concerns about the effects these particles may have on the health of an individual.

Arising from these concerns, we assembled a team to investigate the effect metal oxide nanoparticles had on skin cells. The team comprised experts in synthetic chemistry, nanotoxicology, immunology and photobiology. With funding from the CRC for Advanced Manufacturing and industry partners Micronisers (manufacturing metal oxide nanoparticles) and Baxter's Laboratories (Sunscreen manufacturers), our research team was well placed to investigate the chemical, biochemical and cellular effects of these nanoparticles on those skin cells that lie below the stratum corneum. One of most interesting findings to date was that zinc ions in solution can themselves form nanoparticle-like structures. This was an expected result but only came about by undertaking characterisation studies of such ions in solution. By being part of this trans-disciplinary research, we have extended understanding of how chemical parameters can affect the biological behaviour of nanoparticles, and how these particles behave when they are on the skin.

I am looking forward to next year's meeting in Melbourne, renewing friendships with colleagues from other societies, and to learn about new and exciting research, and of the collaborations that may come from this. I hope that you also can avail yourself of this opportunity and be part of the 2014 AHMRC meeting in Melbourne.

The heroic End-of-Life Intervention: Good or Bad, Fact or Fiction

Chris McGowan, CEO Silver Chain Group. Silver Chain Group is one of Australia's largest not for profit health and community care organisations

All but a very few commentators, now agree that the current trend in the escalation of health care costs in Australia is unsustainable. Both State and Federal government revenues are growing in the vicinity of 1–4% while health care expenditures are growing in the vicinity of 8–11%. If continued, this will obviously result in the health care budget consuming an increasingly higher percentage of overall GDP, and in particular government expenditure.

The dynamics of the health care sector is different than other parts of the economy in that it is predominantly a "consumption dominated" market sector drawing predominantly government funds in our largely universal system. This requires revenues from taxes which in turn has a depressing effect on the remaining economic contributing sectors. The "value" contribution of the health sector needs to be measured in a very different metric to the remaining economy. It is entirely acceptable for a government, to purchase services from a market. However government, as purchaser, needs to be confident that the value is measured in tangible ways and is not diminished through the idiosyncratic dynamics of the health market where the payer is not the direct beneficiary. A market, where the provider receives funding from an independent party other than those to whom services are delivered creates an unwieldy economic disincentive.

A key area of significant health care consumption is in the months preceding death. It is the general consensus in literature that approximately 30% of person's life-time health care costs are consumed in the last year of life. From an extreme utilitarian point of view it seems ironic that the benefits of that significant investment in health care are not enjoyed for very long. Conversely, as a society, it is totally unacceptable to be economically pragmatic so as to deny people access to services in their final stages of life simply because they are not deemed to benefit enough. It is entirely acceptable that significant proportions of health care costs are provided to people in their twilight months regardless of the pragmatic benefits. Our society has an adherence to suffering and that's exactly as it should be.

A current study has been undertaken by Silver Chain looking at cohorts of people in their last years of life in numerous jurisdictions across Australia including NSW, QLD, SA and WA. This study looks at all deaths in specific years and then links the hospital consumption for each death for the proceeding five year period. The objective of this study is to examine the changing patterns of end of life care over multiple periods, between jurisdictions, between ages of death and causes of death along with numerous other variables.

While the data are in the early stages of analysis, of particular interest to the research team are questions of excessive end of life care and interventions; "the heroic but fruitless intervention".

Preliminary examination indicates that this is indeed a myth. It has been well documented in previous studies that the older one is when death occurs the less costs are incurred in the final stages of death. Of particular note, is the use of Intensive Care Services (ICU) for older patients. Days in ICU are quite apparent in the data and show a marked decline with age. Average days in ICU in the last three months of life tend to remain constant about approximately around one day decedent until the age of 75 where is drops by two thirds for those over the age of 85 years of age to a remarkably low 0.06 days in the last three months of life. Furthermore, the overall consumption of ICU in the last months of life has remained reasonably consistent over the past two decades.

The data will continue to illuminate the changing trends in the end of life care over coming years. It appears that early indications are that we have a lot to learn from these data, not only facts but about our collective attribution of "value" in a purchasing sense. Our investments and care for our citizens in their final months will raise questions regarding social and moral value for our community. Are there indeed such indications of futile care as is so often hypothecated? More analysis of the Silver Chain Changing Patterns in the End of Life Care research will be available in 2014 and I hope to share the light on some of these emerging issues.

This full article is available on the ASMR blog @asmr1.wordpress.com

Can medical research ride the ageing wave?

This year's ASMR National Scientific Conference is exploring various aspects of ageing and ageing-related diseases, from head (brain) to toe (bone). Can young blood reverse age-related cognitive impairment? Does black tea have an effect on blood pressure? What role does the kidney have on blood sugar? Is the amount of time postmenopausal women watch TV linked to adiposity? How are the liver, ovaries and androgens affected by ageing? Can exercise stave off skeletal muscle break down? What does ageing mean to bone, and can osteocytes be harnessed for treatments? All these questions, and many more, will be answered during the amazing line up of oral presentations, given by esteemed national and international speakers from diverse fields, including our two orators. Please come and join us in Ballarat from November 17th to 20th, for what is to be an informative conference about an increasingly important topic. Registrations still open! ***http://www.asmr-nsc.org.au***

Firkin Orator 2013 — Dr Rafael de Cabo

Dr Rafael de Cabo

Dr Rafael de Cabo is currently Senior Investigator of the Experimental Gerontology Section at the National Institutes of Health. After obtaining his BSc and MSc (cellular and molecular biology) from the University of Cordoba, and his PhD (nutrition) from Purdue University, he gained a postdoctoral position in the Laboratory of Neurosciences at the National Institute on Aging (NIA) in the USA. Since 2004 he has worked as a tenure track investigator in the Laboratory of Experimental Gerontology, now heading the Aging, Metabolism, and Nutrition Unit (AMNU) at the NIH.

This unit explores the efficacy of nutritional interventions on ageing and age-related diseases through physiological and tissue-specific molecular methodologies. Caloric restriction, in the absence of malnutrition, is widely accepted as extending lifespan and delaying ageing related processes. Research within the AMNU utilises both rodent and in vitro models of caloric restriction, with Dr de Cabo's Laboratory attempting to find a drug that mimics caloric restriction.

Dr. de Cabo is an active member of the Board of the American Aging Association, and is editor of the *The Journals of Gerontology — Biological Sciences*.

Edwards Orator 2013 — Professor Steven Simpson FRS

Professor Steven Simpson

Professor Stephen Simpson is the Academic Director of the Charles Perkins Centre and an Australian Research Council Laureate Fellow in the School of Biological Sciences at the University of Sydney. He returned to Australia in 2005 as an ARC Federation Fellow after 22 years at Oxford where he was Professor of Entomology and Curator of the University Museum of Natural History.

Professor Simpson's research is truly multidisciplinary, harnessing techniques in biomathematics, robotics, neurophysiology, molecular biology, computer science, engineering, biochemistry, population genetics, landscape ecology, behaviour, statistical physics and evolutionary theory.

Through his studies into insects, Professor Simpson co-developed the "Geometric Framework", an integrative model for nutrition. This has since been applied widely from slime moulds to humans, not only for better understanding of the dietary causes of human obesity and ageing, but for other fields such as aquaculture and conservation biology.

Professor Simpson's accolades include being a Fellow of the Australian Academy of Science, a Fellow of the Royal Society, a Eureka Prize for Scientific Research recipient, former NSW Scientist of the Year, and *ABC TV* presenter for the four-part documentary *"Great Southern Land"*.

Academia–Indigenous Partnership

Professor Ross McKinnon (Flinders University), Dr Susan Semple (UniSA), Mr David Claudie (Chuulangun Aboriginal Corporation) and Dr Bradley Simpson (Flinders and UniSA)

With one of the oldest surviving cultures in the world, Australian Aboriginal people have developed immense knowledge about the diverse Australian flora. For more than a decade now, South Australian university-based researchers have worked in collaboration with the Chuulangun Aboriginal Corporation, which represents Kuuku I'yu traditional owner families from Cape York Peninsula, Queensland. The overarching project aims are to develop medicinal plants used by traditional owners in a way that respects both Western and Indigenous perspectives. The long-term vision is to increase opportunities for community members to live on traditional homelands with the development of sustainable business enterprises based on the production of plant-based medicinal products.

Examination of plants that are considered to be medicinally valuable to Indigenous communities provides an opportunity to identify novel compounds or optimise plant extracts that may be developed into suitable medicines. Our most recent work has centred on the characterisation of novel anti-inflammatory compounds from a plant traditionally known as Uncha (*Dodonaea polyandra*). These substances have shown promising results in models of skin inflammation. The intellectual property generated as a result of this research, has led to patent filing for protection of the novel compounds and extracts with the potential for development through cosmetic, complementary medicine and pharmaceutical routes. Ongoing research is examining the commercial developmental pathways and requirements for product development in these spaces.

The Western scientific data gathered as part of this work complements both the traditional knowledge of Northern Kaanju medicinal plants as well as helping to record and preserve this knowledge for the benefit of future generations. This is an important consideration given that in traditional Australian Aboriginal culture, the mode for transferring knowledge from one generation to the next was purely by oral means.

In addition to the laboratory-based research, an integral part of this research is upholding community engagement priorities. This includes researchers visiting Northern Kaanju traditional homelands on Cape York and traditional owners coming to Adelaide as a means of maintaining the two-way exchange of knowledge, dialogue and stories that underpin the collaboration. Our research model follows a rather simple principle that is to ensure there continues to be learning from both sides.

President's Report

Professor Naomi Rogers, ASMR President

The Australian Society for Medical Research plays an integral role in supporting Australia's health and medical research sector and researchers. I have been privileged to be a part of ASMR for a number of years, and to have served on two different state committees and the ASMR Board. Over the past 12 months I have found the role of ASMR President to be both challenging and rewarding, and it has been an honour to represent the Society and the sector in various arenas.

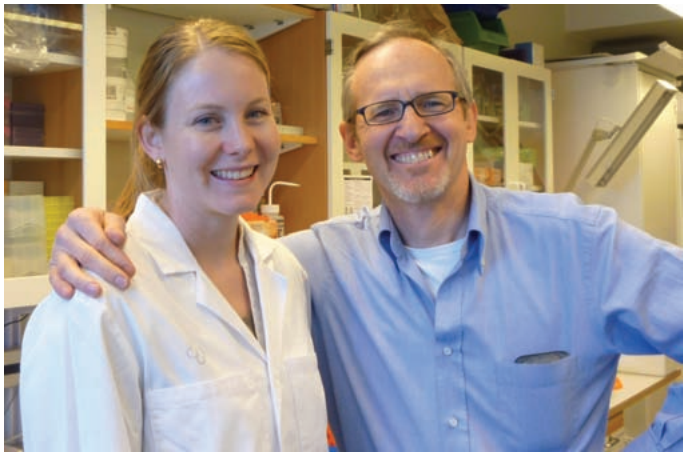
I believe that one reason for the success of ASMR over the past 27 years and all its activities that provide advocacy for our sector is due to the enthusiasm and generosity of ASMR's Board of Directors and State Committees. Throughout ASMR's history the society has been represented by numerous members working in various areas of health and medical research throughout Australia, who feel passionate about health and medical research and want to give back to the sector within which they work.

As President of ASMR, I would like to thank our members for their valued support of the Society in 2013. I would also like to thank all the members of the ASMR State committees and our senior executive officer Catherine West and administrative assistant Priscilla Diment for their hard work and time throughout the past year. I would also like to particularly thank the ASMR Directors who have supported me this year and through their tireless efforts, enthusiasm and dedication ensured the success of ASMR's numerous activities that support and promote excellence in Australian health and medical research. This year we have a number of long serving Directors stepping down from the Board and on behalf of the ASMR membership I would like to personally thank them for all their years of service to ASMR and the ASMR Board — Dr Rosemary Keogh, Associate Professor Kristen Nowak, Dr Rachel Burt and Dr Amanda Philp.

I look forward to watching the evolution of Australia's health and medical research sector into the future and the role that ASMR will play in securing a healthy future for all Australians.

The president's full report is available on the ASMR blog @asmr1.wordpress.com

ASMR Research Award Winners



Ms Emma Ramsay, ASMR International Research Award Winner with Associate Professor Rainer Heuchel

Ms Kimberly Wang, ASMR Dometic Research Award Winner

Emma Ramsay

I spent just over a month with Professor Löhr and Associate Professor Rainer Heuchel at the Karolisnka Institute in Stockholm, Sweden. The main aim of the collaboration was to learn a technique to better understand the relationship between cancer cells, pancreatic stellate cells and endothelial cells and the impact that has on the action of the prodrug GSAO (4-(N-(S-glutathionylacetyl)amino) phenylarsonous acid).

GSAO is a prospective cancer therapy, currently completing a phase I trial in patients' refractory to treatment. For GSAO to have an action it is essential that its γ-glutamyl group be removed. This then allows for the active compound to enter the cell and reach its target in the mitochondria. Its primary target being proliferating endothelial cells. The activation of GSAO is achieved by the enzyme γ-glutamyl transferase (γGT). γGT has been shown to be differentially expressed in a number of cancers; increased expression being observed in cancers of the ovary, liver, lung, and breast and in melanoma and leukaemia. *In vitro* I have observed that cancer cells with high γGT activity significantly increase the response of endothelial cells to GSAO. Further, *in vivo* GSAO has a greater efficacy for tumours with high γGT activity than those with basal γGT activity. This confirms that the γGT status of the tumour will reflect the response of the tumour to GSAO.

We have observed that the cells responsible for the extensive stroma in pancreatic ductal adenocarcinoma (PDAC), pancreatic stellate cells (PSC), when associated with cancer, have a significantly greater γGT than the normal counterparts. Preliminary *in vitro* data in Australia confirms the potential to make use of the cancer associated PSC to deliver the active drug to the PDAC tumour mass. In Sweden I was taught a multi-cellular 3D model in order to be able to determine if the PSC are able to increase the efficacy of GSAO. Studies with this model are ongoing; however initial studies suggest that the interaction between the cells affects the response of the spheroids to the drug.

I would like to thank ASMR for this opportunity to travel to Sweden to perform this work. It was an enormously enriching experience. Along with learning a new technique I was also able to experience a different culture. I would also like to thank those I worked with at KI for all their support and guidance.

Kimberley Wang

Epidemiological studies have demonstrated that low birth weight is associated with a greater susceptibility to cardiovascular disease in adult life. It is not clear why changes in the pattern of body and heart growth in early life can lead to an increased risk of cardiovascular disease in adult life. This is important because cardiovascular disease is the leading cause of death in Australia and because of the chronic nature of cardiovascular disease; it is the most expensive in terms of direct health care costs in Australia.

Local activation of the cardiac renin-angiotensin system is an important modulator of cardiac phenotype and function through its regulation of cardiac hypertrophy, autophagy, capillary density and remodelling through activation of protein kinase B (Akt). During my PhD candidature at the University of South Australia, I found increased phospho-Akt abundance and lower capillary density in the hearts of low birth weight lambs, which may lead to impaired nutrient and oxygen supply to the hypertrophic heart and thus an adverse impact on heart function in later life. Low birth weight also altered cardiac expression of metabolic genes; with increased glucose metabolism and decreased free fatty acid metabolism in postnatal life.

With the support of ASMR Domestic Travel Award, I was able to conduct the next generation sequencing at the Epigenetics Laboratory, headed by Associate Professor Catherine Suter at the Victor Chang Cardiac Research Institute in Sydney. Her lab focuses on the role of epigenetics in regulating biological processes and its role in human health and disease. During my time at the Epigenetics Laboratory, Associate Professor Catherine Suter and Dr David Humphreys were keen to train me in the technique of next generation sequencing, which no doubt would only be beneficial for my career.

During my stay in Sydney, I also presented a poster at the inaugural meeting of the Australian Network of Cardiac and Vascular Developmental Biologists. This allowed me to gain further knowledge in the cardiovascular area and network with fellow cardiovascular researchers. Overall, this trip to Sydney was productive for my research as it allowed me to extend my knowledge to address the aim of my study. I would like to sincerely thank ASMR for allowing me the opportunity to carry out my study at the VCCRI.

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