

“Phenomenal Phenomics – Placing WA at the Centre of the Globe”

Wednesday 3 October 2018, Westin Hotel Perth

Article from the AICC(WA) and Western Australian Health Translational Network Annual Event supported by Murdoch University, featuring Professor Jeremy K Nicholson, ProVice Chancellor for Health Sciences and Executive Director of the Australian National Phenome Centre.



From L to R - Mr John Cluer, Chief Executive, Australia-Israel Chamber of Commerce (WA), Dr David Russell-Weisz, Director General, Department of Health, Professor Lyn Beazley AO, Chair, RPH Medical Research Foundation, Mr David Flanagan AM CitWA, Chancellor, Murdoch University, Dr Fiona Wood, Director, Burns Service of WA, Burns Service of Western Australia, Professor Jeremy K. Nicholson, ProVice Chancellor for Health Sciences and Executive Director ANPC, Professor Gary Geelhoed, Executive Director, Western Australian Health Translation Network (WAHTN), Ms Fiona Roche, Deputy Director General, Department of Jobs, Tourism, Science and Innovation, Professor Peter, Klinken AC, Chief Scientist of WA and Professor David Morrison, Deputy Vice Chancellor, Research & Innovation, Murdoch University

Having arrived in Western Australia just a day earlier, the first public address by Professor Jeremy K Nicholson heralded a key moment for the actualisation of the Australian National Phenome Centre (ANPC). The initiative is a core platform of the Western Australian Health Translational Network (WAHTN).

Described [by Murdoch University](#) as a game-changing new research centre, the phenome centre promises to transform the treatment of disease and improve the health of millions of people in Western Australia and beyond.

World-leading phenomics research at the ANPC is set to revolutionise the diagnosis, prevention and precision treatment of a multitude of medical conditions including cancers, obesity, autism, dementia and type 2 diabetes in individuals and, on a larger scale, across communities. Its benefits

are not limited to human health, but can also be used to unlock new discoveries in areas such as animal health and agriculture.

A person's phenome is a snapshot of their unique biology resulting from the complex interactions between environmental factors such as their diet, lifestyle and exposure to pollutants, and their genes. Analysing these biological "fingerprints" helps researchers better understand the underlying causes of disease and to develop personalised treatments to prevent and treat it.

Professor Nicholson spoke of longevity with particular emphasis on aged care health, achieved through defining personal biology and tailoring therapy through the delivery of precision medicine.

"We are trying to develop a new healthcare knowledge continuum that defines population health and disease from cradle to the grave. This involves measuring genetic, nutrition and environment interactions at large scale. Only in this way can we get personalised healthcare solutions based on knowledge of the deep biology of those populations- starting with those of Western Australia but eventually extending round the world."



Professor Jeremy K. Nicholson, ProVice Chancellor for Health Sciences and Executive Director (ANPC)

He observed that the inhibitors to optimising medical practice are not through science or technology (of which, plenty is available) but rather through environmental factors including regulation, education, and limited health sector resources.

Sharing examples such as Diabetes treatment, Professor Nicholson outlined a complex systems-based approach to identifying biological cause and treatment via patient journey phenotyping. *"Phenomics measure chemicals in the blood and determine metabolic phenotyping in the body. The result is an individual metabolic signature for the patient."* He further described how phenomic research can assist with profiling and predicting disease within populations. This technology can be further augmented to deliver to other industries such as agritech and food security.

Describing the challenges, processes and outputs of the ANPC as a translational healthcare engine, Professor Nicholson showcased the intended impacts of the project. These included;

- Supporting future healthcare policy
- New translatable strategies for stratified medicine
- New visualisation tools to create approaches for clinical actionability
- International harmonisation in Metabolic Phenotyping and Systems Medicine



Professor Peter, Klinken AC, Chief Scientist of WA

Engaging dialogue with WA Chief Scientist Professor Peter Klinken followed Professor Nicholson's address. They discussed the speed of which sequencing has evolved, bioinformatics, and data based research that could potentially be locally focussed. Using the ANPC's sophisticated technology, researchers plan to map the phenomes of the entire population of Western Australia, giving them a window into environmental and social factors influencing health trends and providing generations with a crystal ball into their future health risks.

On a personal level, Professor Nicholson confided he was attracted to Western Australia due to the level of WAHTN facilitated collaboration across the universities, industry bodies and healthcare organisations. He spoke of his ambition to evolve a world class centre of excellence, and to deliver findings with global benefits. *"Science is for everybody, and can be made accessible. We have common problems. No one University, no one Country can do this on their own."*

Murdoch University Chancellor Mr David Flanagan concluded the event, citing the golden opportunity that the ANPC provides to the University and to Western Australia. Describing the initiative as "brave and bright" he also emphasised the power of cross-institutional collaboration and extolled the "foresight, courage and wisdom of the WAHTN". The ANPC represents Murdoch's largest research initiative, and in welcoming Professor Nicholson, emphasised that the project was indeed a "big deal."



Mr David Flanagan AM CitWA, Chancellor, Murdoch University and Professor Jeremy K. Nicholson, ProVice Chancellor for Health Sciences and Executive Director (ANPC)

WATHN

Professor Gary Geelhoed, Executive Director of the [Western Australian Health Translation Network \(WAHTN\)](#), spoke about local, national and global collaboration that result from alliances. He described the ANPC as a “fantastic example of what occurs when interested organisations work together to deliver a new initiative”. He further noted that new generation researchers can be attracted into the sector through this and similar projects.

The WAHTN brings together Western Australia’s major hospitals, medical research institutes and five universities to capitalise on the substantial State investment in new facilities for health research, patient care and population well-being.



Professor Gary Geelhoed, Executive Director, Western Australian Health Translation Network (WAHTN)

Western Australia has a heritage of successful medical training and research discoveries that have translated into ground-breaking improvements in patient care and international changes in health policy. This record has been recognised by Nobel prizes, Australian of the Year awards, international awards and fellowships.

Western Australian Health Translation Network incorporates key themes of health care which illustrate outstanding integrated discovery, translation, and clinical care delivery, not only to Western Australia but also influencing national policy and increasingly driving health care outcomes throughout our time zone into South East Asia and China.



About AICC(WA) Lifescience Bilateral Trade

Providing context to the innovation and evolution of the ANPC, Mr John Cluer, AICC(WA) Chief Executive spoke about the impact and intensity of medical research and commercialisation in Israel.

One of the great things that Western Australia and Israel have in common is that both places can boast high standards of health care and world leading examples of medical research. Mr Cluer noted that Western Australia's standing in this regard will be greatly enhanced by the arrival of Professor Nicholson and the much-anticipated evolution of the ANPC.

Israel is at the forefront of development of personalised medical innovations, and has large industries for biotech and life science, pharmaceuticals, rehabilitation, cancer treatment, and nanotechnology. The breakthroughs and imaginative applications in Israeli medicine have

revolutionised medical diagnosis, surgical procedures, healthcare, and the pharmaceutical industry. Mr Cluer shared some examples including;

- There are some 1,350 life sciences companies active now in Israel, 612 of them having been recently created.
- Some \$US823 million flowed into the Israel medical and biotech sector last year, accounting for 20% of all investments in Israeli high-tech. The industry is maturing with a third of these companies in preliminary revenue phase, and 5% in the revenue growth stage.
- Israel is the number one country for granted patents per capita in the medical device area, and the second leading publisher of stem cell research in absolute numbers.
- Magnet, a program of the Chief Scientist of the Ministry of Industry and Trade, has a five-year budget of over \$US 200 million to support carefully targeted generic technologies or pre-competitive concepts, such as electro-optics or biomedical diagnostics, by coordinating groups of academics and businesses.
- Digital healthcare is one of Israel's fastest growing sectors with almost 400 companies in fields such as analytics, big data, personalised medicine, blockchain in healthcare, and medical administration.

Mr Cluer concluded *"You don't have to travel far around Western Australia to see just how much of Israel's medical science has reached our shores and is in use through daily medical practice."*



Mr David Flanagan AM CitWA, Chancellor, Murdoch University, Mr John Cluer, Chief Executive, Australia-Israel Chamber of Commerce (WA), and Professor Jeremy K. Nicholson, ProVice Chancellor for Health Sciences and Executive Director (ANPC)

About Professor Nicholson

Professor Nicholson is formerly Head of the Department of Surgery and Cancer and Director of the MRC-NIHR National Phenome Centre at Imperial College London and has recently commenced as ProVice Chancellor for Health Sciences and Executive Director of the Australian National Phenome Centre (ANPC) at Murdoch University.

Professor Nicholson has published more than 800 academic papers.

Further information about Professor Nicholson's career and research interests can be accessed on <http://www1.imperial.ac.uk/medicine/people/j.nicholson/>



Ms Joce Young, Chief Executive Officer, RPH MRF and Professor Lyn Beazley AO, Chair, RPH Medical Research Foundation



Mr Anthony Fortina, Deputy Director, Office of Research Enterprise, The University of Western Australia and Dr Campbell Thomson, Director, Office of Research Enterprise, The University of Western Australia





Dr David Cox, Board Member, RPH MRF and Dr Lara Hatcheul, Research Physician, Linear Clinical Research



Mr Mario D'Orazio, Managing Director, Channel 7 Perth and Mr Charlie Gunningham, Advisor, Accelerating Commercialisation



Mr Alistair Forrest, Laboratory Head, Systems Biology & Genomics, Harry Perkins Institute of Medical Research and Mr Rob Eikelboom, Manager Research Developments and Grants, Ear Science Institute Australia