

Media release

State-of-the-art metabolomics food library launched in Western Australia

- This four-year CRC project will develop suite of novel chemical fingerprinting methodologies to help prove the provenance and nutritional credentials of premium WA products
- Western Australian artichokes and wines will be the first of many products to be analysed and added to 'fingerprinting libraries' of high-value agricultural materials
- The four-year, \$1.6 million project involves researchers at Murdoch University's Australian National Phenome Centre, in collaboration with Bruker Biospin GmbH and the WA Department of Primary Industries and Regional Development as part of the Future Food Systems Cooperative Research Centre

Scientists at Murdoch University's Australian National Phenome Centre (ANPC) are embarking on a project with Bruker BioSpin and SMEs across Western Australia to create unique chemical fingerprinting methods for WA produce as part of the Future Food Systems CRC.

The overarching aim of the 'Analytical Assessment of Food Quality and Processing Systems, Tracing, Biochemistry and Nutritional Properties of Foods' ('ANPC Analytics') project is to connect nutritional quality and food composition with positive healthcare outcomes through nutritional health claims.

The ANPC is teaming with global scientific equipment manufacturer Bruker Biospin GmbH and the WA Department of Primary Industries and Regional Development (DPIRD) on the metabolomics food library project.

"We're going to generate detailed chemical information of food and food products to verify their chemical make-up, nutritional functionality and other key attributes such as authenticity and freshness," said Dr Ruey Leng Loo, from Murdoch University's Centre for Computational and Systems Medicine, who is leading the project.

"Our approach will enable food quality monitoring and allow fingerprint traceability. This will help Australian producers achieve higher prices for their goods in premium markets and boost the country's reputation as a supplier of some of the best agricultural products to the world."

In time, the project will also cover nutraceutical and pharmaceutical products.

Various local providers are partnering in the program to have their produce analysed, including Mt Lindesay.

"We are breeding organic globe artichokes for multiple health benefits at the molecular level," said Dr Mark McHenry, owner of mixed-farming enterprise Mt Lindesay.

"This research collaboration will allow us to determine what healthy molecules are there and what we can enhance naturally."



Future Food Systems Ltd
ABN 72 633 356 984
L6 Hilmer Building E10
UNSW Sydney G2 High St
Kensington NSW 2033 Australia

The research will take place at the ANPC on Murdoch University's Perth campus and within the Food Innovation Precinct of the soon-to-be-opened Peel Business Park.

The \$1.6 million project is part of the Future Food Systems Cooperative Research Centre, which is delivering a 10-year national research program that uses high-tech solutions to increase the nutritional and commercial values of Australian food products.

Professor Jeremy Nicholson, Director of the ANPC and Program lead for the CRC project, said the research presents significant benefits for both the food industry and healthcare.

"The project uniquely leverages the multilevel analytical firepower of the ANPC to deeply characterise food composition in a way that helps us understand the molecular basis of healthy nutrition and will help enable future preventative medicine strategies at the individual and population level.

"The data will also support food health claims that can add significant value to Australian products."

Dr Iris Mangelschots, President of Bruker BioSpin's Applied, Industrial & Clinical division, said the project exemplified a constructive scientific partnership.

"We are honoured to have been selected as a strategic partner in the Future Food System program," said Dr Mangelschots.

"By linking the detailed chemical fingerprints of premium food products – generated using Bruker's nuclear magnetic resonance (NMR) FoodScreener™ system – with biofunctionality, this project can develop scientific evidence to support value added health claims for Australian food producers while leveraging quantitative nutritional information to support metabolic healthcare decisions.

"In addition, these biofunctional health claims will be validated at the ANPC by using Bruker's IVDr Clinical NMR Research Platform.

"The high-throughput NMR method provides a wealth of information that is both targeted (quantification of defined substances) and non-targeted (identifying deviations from reference spectra in an unbiased multi-omics approach), ranging from the detailed chemical composition of the food to the geographical origin and identification of any form of adulteration."

DPIRD Horticulture and Irrigated Agriculture Director Rohan Prince said the visionary project would provide scientific proof of the quality and attributes of WA produce, helping to forge new market opportunities.

"The department will link industry with the facility by identifying priority farming systems and agricultural products for ANPC analysis that have the potential to create a competitive advantage and benefits to WA's primary industries.

"This exciting project is using science to validate WA's enviable reputation as a reliable supplier of safe, clean, nutritious premium quality products to provide opportunities for product differentiation and value adding and to capture a share of the competitive global food market."



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About the ANPC

The Australian National Phenome Centre, part of Murdoch University, has been designed to facilitate the study of human metabolic phenotypes using integrated analytical technologies that are sensitive, accurate and highly reproducible. ANPC researchers apply cutting-edge analytical and modelling approaches to various scenarios, from population-scale phenotyping to biomarker discoveries and optimisation of personal nutrition. They also utilise these approaches to study other biological systems, relevant to agricultural production, bioprospecting, environmental health, conservation science and more. ANPC brings exceptional scientists and cutting-edge equipment and instrumentation to the CRC.

For more information about the ANPC, visit www.murdoch.edu.au/research/anpc

About Bruker BioSpin

Bruker's sophisticated scientific instruments and high-value analytical and diagnostic solutions enable scientists to explore life and materials at molecular, cellular and microscopic levels. The company collaborates closely with clients in life-science molecular research; applied and pharma applications; and microscopy, nano-analysis and industrial applications. Bruker has also become a provider of high-performance systems for cell biology, preclinical imaging, clinical phenomics and proteomics research, clinical microbiology and molecular pathology research. It provided a suite of state-of-the-art equipment for the Australian National Phenome Centre at Murdoch University, and its instrumentation is a critical enabler of cutting-edge research to advance personalised medicine and precision nutrition under the CRC's Research Program 3.

For more information about Bruker BioSpin, visit www.bruker.com

About Dr Ruey-Leng Loo

Ruey Leng Loo has a background in clinical pharmacy and extensive clinical experience as a pharmacist at various UK National Health Services. After taking out a PhD in metabolic phenotyping from Imperial College London, she held a postdoctoral position at Imperial College. Dr Loo then worked as a Clinical Lecturer in Pharmacy at the University of Kent, UK, being promoted to Senior Lecturer. In 2019, she relocated to Murdoch University, having secured a Premier's Early to Mid-Career (EMC) Fellowship from the Western Australia Department of Jobs, Tourism, Science and Innovation. In recent years, Dr Loo's focus has been on applying metabolic phenotyping in epidemiological and dietary intervention studies. In parallel, she has applied data analytics for metabolic phenotyping in food.

For more information about Dr Ruey-Leng Loo, visit www.australian-npc.org/team/ruey_leng



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About the Future Food Systems CRC

The Future Food Systems Cooperative Research Centre (CRC) is a national initiative funded as part of the Australian Government's CRC Program and commenced in December 2019. Its goal is to broker industry-led collaborations between business, researchers and the community that improve the competitiveness, productivity and sustainability of Australia's agrifood sector, especially in areas of competitive strength. CRC industry partners include large and small firms across farming, food manufacturing and technology services that share a vision for increasing Australia's ability to value-add agrifood production and build scale in growth markets for trusted, healthy food and advanced precision-nutrition goods.

For more information about the Future Food Systems CRC, its participants and its research, visit the CRC's website: www.futurefoodsystems.com.au or subscribe to its monthly eNews. www.futurefoodsystems.com.au/contact-us/#subscribe-to-newsletter

Media enquiries

For further information, interview opportunities and images, contact:

Merran White
Communications Manager, Future Food Systems CRC
M +61 411 728 984
E merran.white@futurefoodsystems.com.au



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L6 Hilmer Building E10
UNSW Sydney G2 High St
Kensington NSW 2052 Australia

The CRC Program supports industry-led collaborations between industry, researchers and the community. Further information about the CRC Program is available [here](#).

T +61 (0)2 9385 9673
www.futurefoodsystems.com.au