



Research & Innovation

PROSPECTUS

Expert Solutions

ChemCentre has a proud history of Research and Innovation for the benefit of Western Australia.

We operate a world-class hub of unrivalled systems, knowledge and expertise built up over more than a century.

Our researchers are constantly looking to the future, helping to bring greater certainty by providing innovative, specialist analytical chemistry and forensic science solutions for a safe and prosperous state.

our Vision

ChemCentre is Western Australia's leading provider of specialised chemical and forensic science services.

our Mission

ChemCentre provides chemical and forensic science services for a safe and prosperous Western Australia.



About Us

ChemCentre traces its origins to the State's historic gold rush and the Laboratory of the Government Analyst in 1896. Subsequently the Government Chemical Laboratories were formed. In 2007, ChemCentre was established as a statutory authority and moved to its current location in Bentley in 2009.

We continue to evolve and play a major role in the delivery of scientific services to the benefit of the community of WA.



A close-up photograph of a person's hand wearing a blue nitrile glove, holding a large, round-bottom glass flask. The flask is filled with a vibrant pink liquid. The background is a blurred laboratory setting with various glassware and equipment. The text is overlaid on the upper left portion of the image.

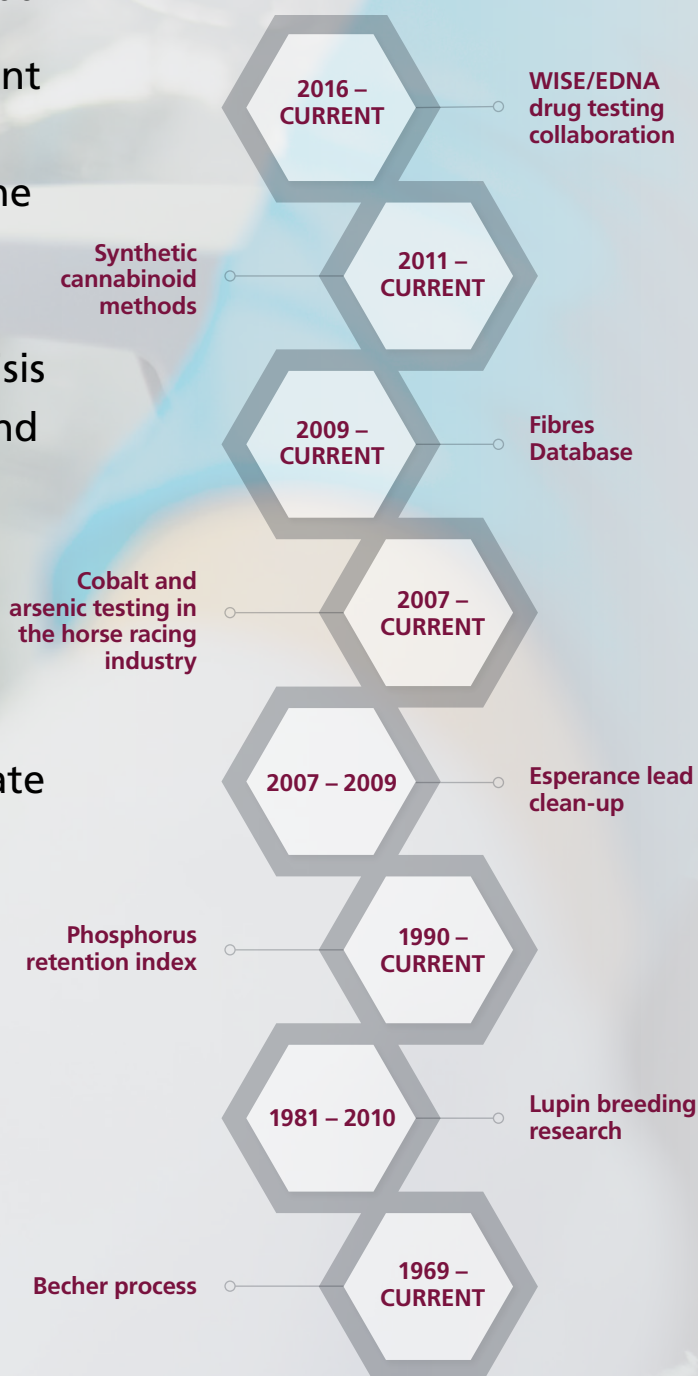
We apply technical and specialist knowledge to solve difficult problems for communities, government and industry.

Why we do it

Our research priorities reflect those outlined under the Chemistry Centre (WA) Act 2007:

- Mitigate risks to government associated with public health, public safety and the environment
- Keep the State safe during times of emergency and crisis
- Support the State justice and policing systems
- Support the sustainable economic development of the State
- Support science capability and engagement in the State

Our Impact



A sound investment



ChemCentre is the longest continually NATA accredited testing laboratory in Australia.



Fully trained and tertiary qualified staff. Many of our experts are leaders in their field, serving on state, national and international working groups and advisory bodies.



Provider of choice for government at state, national and international levels.



Expert interpretation, legally defensible results and externally audited quality systems.



Modern purpose-built laboratories and state of the art equipment.



We work with government agencies, academic institutions, industry and other researchers on wide ranging R&I programs and the promotion of chemistry-based education and training.

Partner with us

Our proactive approach to research activities builds capability and skills that enable ChemCentre to refresh its service delivery capacity, stay relevant and better position it to respond to government, client and market needs.

Our expertise goes beyond analytical chemistry and forensic science. We have experts who can collaborate with your staff across many fields.

Our research activity assists both government and industry to make informed decisions and develop evidence-based policies to mitigate Western Australia's chemistry-related risks to public health and safety.

With the increasingly rapid rate of technological change and growth in client demands, Research and Innovation has never been more critical.

We have has formed strong industry and academic collaborations to undertake product research aimed at value-adding and increasing market potential to assist in growing and diversifying the WA economy.

KEY RESEARCH THEMES



Law and Order
and Emergency
Response



Public and
Environmental
Health and Safety



Sustainable
industry
development



Essential scientific
infrastructure
technology & skill -
building capability

KEY FOCUS AREAS



Environment
and Mining



Agriculture
and Food



Water



Forensic Science



Honey CASE STUDY

ChemCentre is internationally recognised as a leader in research that has resulted in certification of Western Australian monofloral honeys. Monofloral honey comes from the nectar of a single plant species, such as jarrah or marri. These monofloral honeys are known to have beneficial qualities that provide producers a premium in the market.

Research being done at ChemCentre aims to complement efforts by the WA bee industry to address the increasing problems of honey fraud and adulteration, and the traceability of bee products. This includes focussing on overcoming constraints on the storage and supply of monofloral honey and enables the creation of a certified distributor pathway for honey products into international markets.

ChemCentre was a foundation partner in the formation of the national Cooperative Research Centre for Honey Bee Products (CRC HBP). Research into WA mono-floral honeys has extended into quantifying its antioxidant and anti-inflammatory properties, areas of considerable therapeutic interest. ChemCentre also collaborates via the CRC with researchers investigating bee nutrition, flowering event prediction, palynology, and supply chain systems security development.

ChemCentre has established new NATA certified methods that meet International Standard Organisational (ISO) requirements. The certification process uses compositional chemistry and supply chain certification systems to characterise different bee products. It protects against inferior product substitution to provide greater consumer certainty in international marketplaces, allowing WA honey to achieve premium product status.

The R&I model developed for this research has relevance to other agriculture and food sectors. It is receiving increasing support from other industries and funding institutions because of the successful industry outcomes achieved.



Proteomics CASE STUDY

Proteomics refers to the systematic identification and quantification of the proteins in biological systems – such as those within a cell, tissue, organ or biological fluid. These techniques provide a valuable addition to ChemCentre's suite of Forensic Science capabilities.

ChemCentre has established proteomics-based forensic methodologies, using high resolution mass-spectrometry to develop powerful screening and quantitative NATA accredited analyses.

The research area has established enhanced methodology for the detection and analysis of performance enhancing peptides in racehorses and also larger molecules of forensic interest, such as insulin in post-mortem coronial cases.

ChemCentre researchers have developed methodology and successfully used proteomic analyses to confirm the presence of synthetic insulins in the vitreous humour of suspected insulin overdose cases to determine cause of death. The determination of an insulin overdose by toxicological analysis of post-mortem samples is challenging and currently not performed elsewhere by Australian forensic toxicology laboratories.

Proteomics methodology has also made it possible to detect and uniquely identify nine snake venoms via their peptide markers taken from swabs of the bite site. This has resulted in the first case

of unequivocal identification of the Eastern Brown snake venom in a swab taken from a person who had succumbed to the injury. Unequivocal identifications such as this using proteomic mass spectrometry technique is the gold standard within forensic toxicology.

The ChemCentre proteomics research team is also investigating the development of protein-based human identification as a novel and innovative tool with the potential to be used by forensic investigators to associate evidence with a suspect. Similar to DNA, this method takes advantage of an individual's biological variation and could be used to complement established DNA-based methods or be used when these methods or samples fail to provide a forensically useful answer. A core focus will be the development of this technology to the point where it can be used to infer the profile of matching genetic variation and to use this in a legal context.





Future battery industries

CASE STUDY

Western Australia is unique in that it has all of the necessary raw materials to make advanced batteries such as those based on Lithium. As a result of this, Australia's Future Battery Industries CRC is based in Perth. ChemCentre is a key partner in the CRC which includes partners from industry, academia and government. The CRC aims to position Australia as a global leader in industry focused research into the rapidly transforming battery value chain.

ChemCentre's contribution will draw on its significant expertise in the development and application of new assessment methods, such as sequential leaching tools and Leaching Environmental Assessment Framework (LEAF) modelling. These tools are utilised in environmental risk identification and quantification, mine closure planning and to predict potential long term risks of utilising waste-derived materials.

The research findings to date fill significant knowledge gaps for industry and government. In addition, these tools will generate considerable chemistry-rich data that could be used to inform the development of new mineral processing and extraction methods for rare or complex ores. This is of special relevance given that optimal extraction methods for rare earth and lithium bearing ores are still under development.

Importantly, with Western Australia positioning to become a leading international exporter of future battery components, ChemCentre is working to make valuable contributions towards the development of a certification framework for the purity and quality of battery components.



The process





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