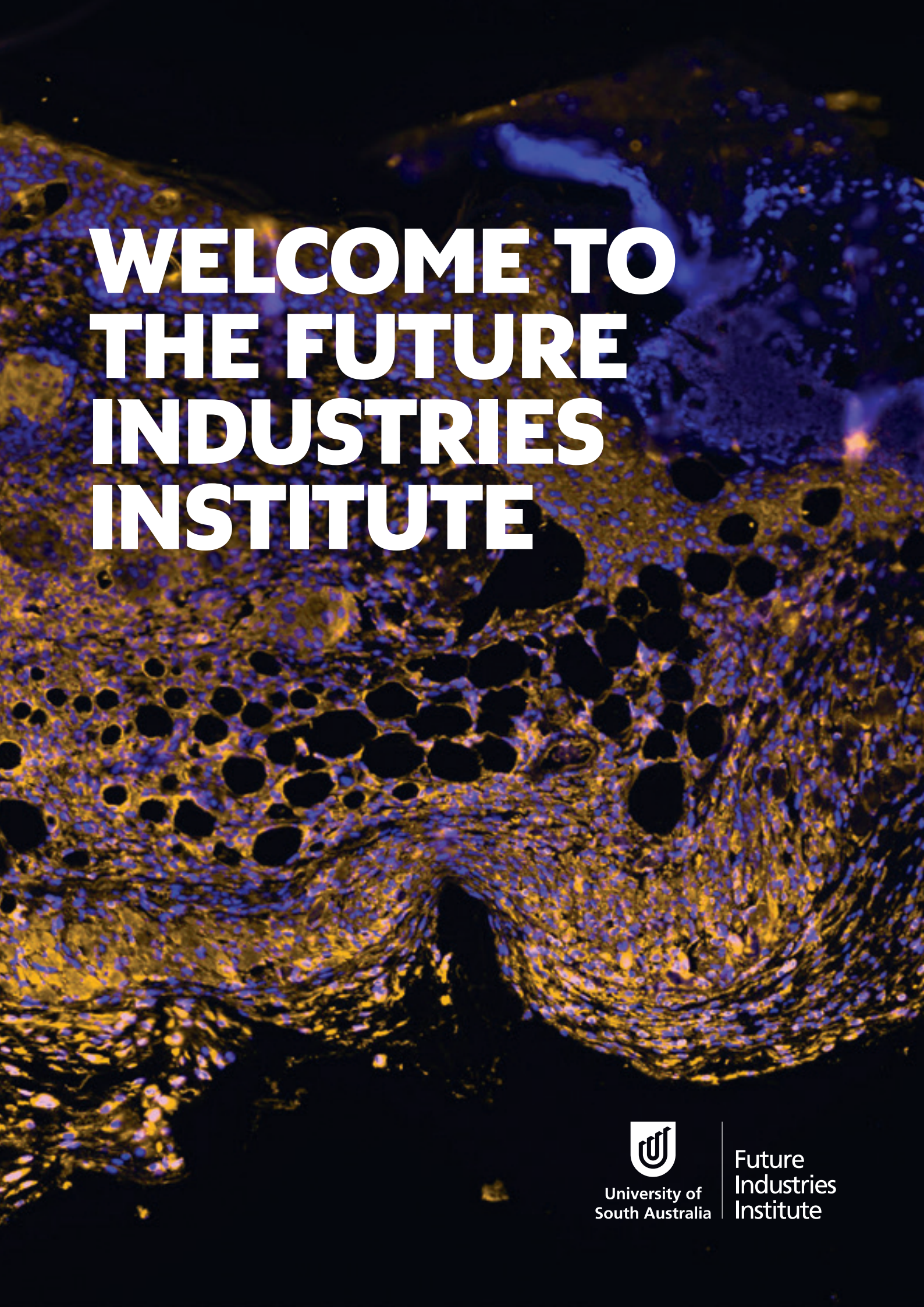


WELCOME TO THE FUTURE INDUSTRIES INSTITUTE

University of South Australia | Future Industries Institute

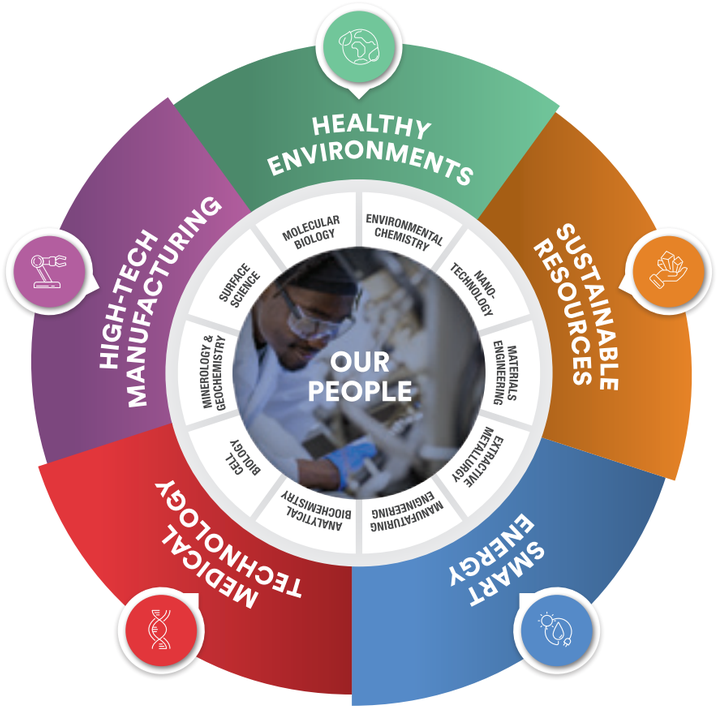
An internationally recognised research institute, the Future Industries Institute (FII) solves real world problems via collaboration, innovation and technological advances.

Undertaking research across five key industry sectors, FII works closely with industry to lead positive change into the future.

unisa.edu.au/FII

About

The Future Industries Institute (FII) partners with industry and the professions to deliver innovation and technological advances to solve real world challenges. With research strengths across five sectors that cross disciplines from biomaterials engineering to minerals processing, FII creates local and global impact. Our research degree students partner with industry and end-users to develop their skills and relevant career experience and our state-of-the-art facilities support research growth and expertise. The Institute provides R&D services to solve industry challenges via $80 million of specialised laboratories and equipment.



Vision

Our vision is to sustain and establish solution-focussed research that is responsive to both the needs of industry and the community.

Mission

Through excellence in research and partnerships with industry, we deliver the next generation of innovation and technological advances to solve real world challenges. By collaborating with complex and growth-focused industries, FII researchers undertake cross-disciplinary, world class research that is informed, innovative and relevant.

Research Strengths

The Institute undertakes cross-disciplinary research related to five key industry sectors: Healthy Environments; High-Tech Manufacturing; Medical Technology; Smart Energy; and Sustainable Resources. With state-of-the-art facilities and infrastructure, new technologies and approaches are being developed to support state and national economic growth. Working closely with industry partners and end-users ensures our researchers and students engage in real world experiences to create local, national and global impact.

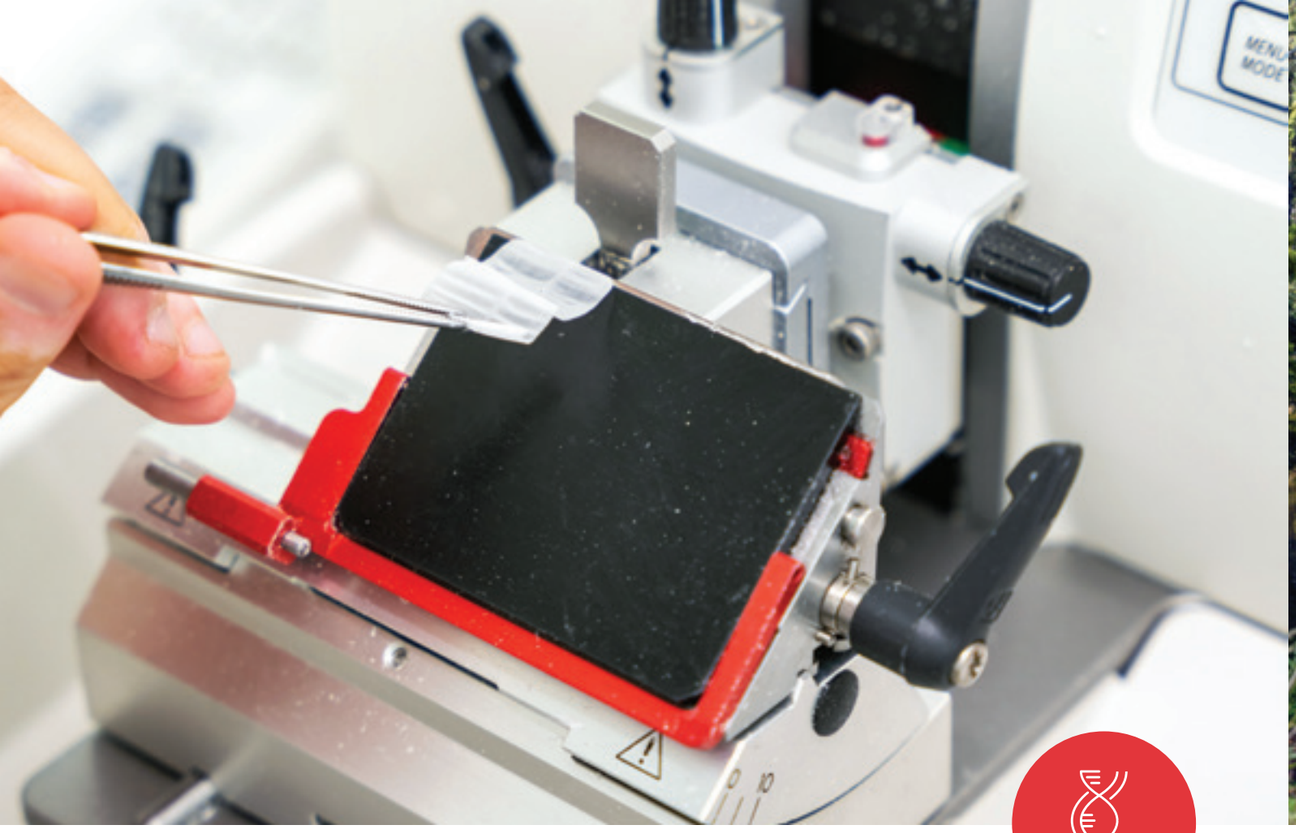
High-Tech Manufacturing

Supporting industry via inter-disciplinary research and next generation innovation.

High-Tech Manufacturing is a critical component of all advanced economies. Innovation and transformation within our manufacturing sector, including the uptake of digital technologies, is driving the evolution of manufacturing in key industry sectors such as space, agriculture, defence, health and energy. With an ever growing awareness of environmental, social and corporate governance, our manufacturing research is multidisciplinary, seeking to bring clean and green technologies to the forefront as we tackle real world, industry relevant challenges. Many of our scientists and engineers have first-hand experience of working in industry.

Our research capabilities include:

- Materials science and engineering
- Optical design and engineering
- Additive manufacturing
- Product testing and evaluation
- Surface Science & nano-technology
- Design and deposition of multi-layer thin film coating systems
- Developing environmentally robust coatings for real world applications
- Process development and scale-up
- Device design and fabrication
- Clean and green manufacturing technologies



Medical Technology

Delivering better health outcomes through world class science, medicine and engineering research.

Researchers at the Future Industries Institute are developing and implementing new sensors, diagnostics, biomaterials, technologies and therapeutic approaches for a range of medical issues including wound healing, cancer diagnosis and treatment, precision radiotherapy, topical drug delivery and prenatal diagnosis and care.

Our research capabilities include:

- In vitro and in vivo model development, testing and analysis
- Biomarker identification
- Biofilm and infection
- Responsive and targeted drug delivery vehicles
- Fabrication of nanostructured materials
- Topical drug delivery
- Materials science
- Organ-on-chip
- 3D bioprinting
- Organic and inorganic nanoparticles
- Design, fabrication and testing of microfluidic devices
- Optical and electrochemical biosensors

Healthy Environments

Changing the world by addressing environmental sustainability and population health.

A healthy environment for disease prevention is a global imperative. The need for immediate action to care for our environment and prevent further damage has never been so clear. Researchers at the Future Industries Institute draw on their expertise in the areas of contaminant analysis, ecotoxicology, thermal energy applications and marine ecology to develop innovative solutions to the challenges facing agriculture and the environment. Our focus on remediation of contaminated sites, the control of antibiotic resistant microorganisms, food security and energy storage ensures health equity and economic benefits for all.

Our research capabilities include:

- Environmental and human exposure assessment
- Characterisation and remediation of contaminated sites
- Food security, plant nutrition and soil fertility
- Risk assessment of emerging contaminants
- Environmental microbial ecology, metagenomics and antibiotic resistance
- Waste characterisation and valorisation
- Marine ecology and seafood provenance

Sustainable Resources

Towards a cleaner, more sustainable resources sector.

The Future Industries Institute delivers outcome-driven research to a resources sector challenged by decreasing deposit quality and reduced deposit discovery. Our researchers provide solutions for industry seeking to deliver the raw materials required for the global transition to a low-carbon economy. Working with industry and the professions, we strive to improve rates of discovery, optimise process performance, reduce energy and water usage and assist in the assessment and introduction of technological innovations across the resources value chain.

Our research capabilities include:

- Mini pilot scale process assessment
- Surface analytical characterisation
- Microtomography
- Sensor research and micro-fabrication of devices
- Development of in-field analytical techniques
- Materials science
- Petrology
- Isotope geochemistry and geochronology

Smart Energy

Developing technologies to transform existing and develop new highly efficient, renewable and safe devices.

Researchers within the Future Industries Institute aim to address the rising demand for new and novel energy systems by developing a range of materials and manufacturing processes that allow them to be engineered for domestic, commercial and portable use. Complementary to this is research addressing the life cycle of a product, from raw materials to a product to its eventual recycling/disposal/reuse. We do this from a fundamental research perspective and in partnership with industry for commercialisation.

Our research capabilities include:

- Mineralogy and metallurgy
- Phase change materials
- Optical and electronic materials
- Photothermal materials and systems
- Betavoltaics
- Materials for hydrogen
- End of life considerations
- Life cycle analysis

University of South Australia | Future Industries Institute

Australia's University of Enterprise

FII Headquarters
X Building, Mawson Lakes Campus
Mawson Lakes Boulevard
Mawson Lakes SA 5095

Email: FIIAdmin@unisa.edu.au
Phone: (08) 8302 3404

unisa.edu.au/FII

Front cover image: *Staining of vascular growth markers in wounded skin helping us understanding the mechanism of antibody therapy* by Alireza Hassanshahi (PhD student of Prof Allison Cowin) – Microscopy Australia, November 2021.

Information correct at time of publishing (May 2023).

CRICOS provider number 00121B / Australian University provider number PRV12107

Acknowledgement of Country

UniSA respects the Kaurna, Boandik and Barngarla peoples spiritual relationship with their country.

unisa.edu.au/RAP

Artist: Ngupulya Pumani