QSBC

QUEENSLAND SPATIAL BIOLOGY CENTRE

Investing in today's research for tomorrow's treatment

IN COLLABORATION WITH

THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

WESLEY
RESEARCH INSTITUTE

A catalyst for change

The Wesley Research Institute is Queensland's second oldest medical research organisation known for its high impact, patient focused, health and medical research outcomes and social contribution.

We take a collaborative approach to research, bringing together clinicians, allied health professionals, scientists, patients and the community to work toward a common goal – to improve healthcare outcomes globally.

With over 30 years of commitment to faster diagnosis, better treatment options, and cures, we're embarking on a groundbreaking initiative – the Queensland Spatial Biology Centre (QSBC). In partnership with the University of Queensland, the Centre is the first of its kind in Australia. The QSBC will accelerate our research, leading to improved treatment options to increase survival rates and quality of life.

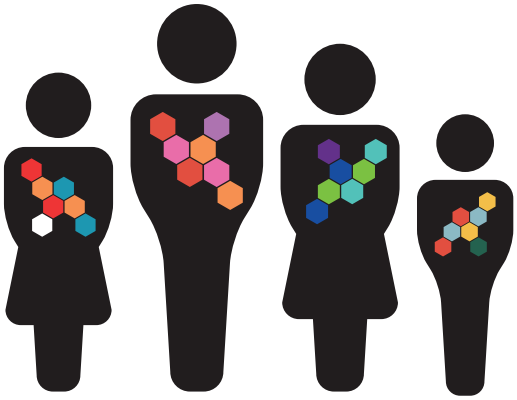
WRI CEO Andrew Barron (second from right) with QSBC team, Dr Arutha Kulasinghe, Professor John Fraser and Dr Meg Donovan.

How is QSBC reshaping the future of healthcare?

- We can now see why some people respond to treatment and others don't, by mapping individual cell interactions within each patient's tumour at an unprecedented level. Our team are working towards creating predictive signatures for an array of diseases, to identify which therapy will have the best outcome. In the next 5 to 10 years, these signatures will help clinicians across the globe create personalised treatment plans to improve quality of life and survival rates.
- We are based at The Wesley, one of the largest comprehensive cancer centres in Australia, allowing access to large volumes of patients, as well as enabling doctors and scientists to collaborate.
- We have a Biobank onsite for tissue samples and associated clinical data for biomedical research, as well as state-of-the-art spatial omics technology, including the Akoya PhenoCycler®- Fusion System, one of its kind within an Australian hospital.
- We have the facilities and team to complete the whole cycle, from getting the tissue sample, using technology to profile it, to a team of clinicians and data scientists to analyse the data.
- We are a small agile team which has access to the UnitingCare network, including four private hospitals, Lifeline and Bluecare.

Thanks to cutting-edge technology and their expertise, for the first time our QSBC researchers can see sensitivity and resistance to therapy within tumours of individual patients – but they need people like you, to help sustain their work and turn it into invaluable treatments sooner.

Spatial biology explained – how will it save lives?



The current "one size fits all" approach to medicine will soon be a thing of the past

Each patient is unique, and through our research, we are unlocking the intricacies of their biology to **personalise therapies** for a range of debilitating diseases, leading to improved quality of life.

The **new technology** we are harnessing through QSBC will help provide the answers for why some people respond to specific treatments, and others don't.

"Digital spatial profiling allows us to see a patient's tumour cell by cell. We can walk across that tissue almost like a Google Maps approach, where we can see how individual tumour cells are communicating with their neighbours, and also the immune cells in the vicinity. Being able to see this information directly on the tissue becomes really, really powerful. Our unique approach combined with the new technology allows us to understand disease better, assess patient responses to treatment and enhance the quality of life for those undergoing therapies."

- Dr Arutha Kulasinghe, Scientific Director, Wesley Research Institute's QSBC

What we're working towards

01

Patient is diagnosed and requires treatment

02

A tissue sample is taken from this patient

03

Cell profiling within the tumour

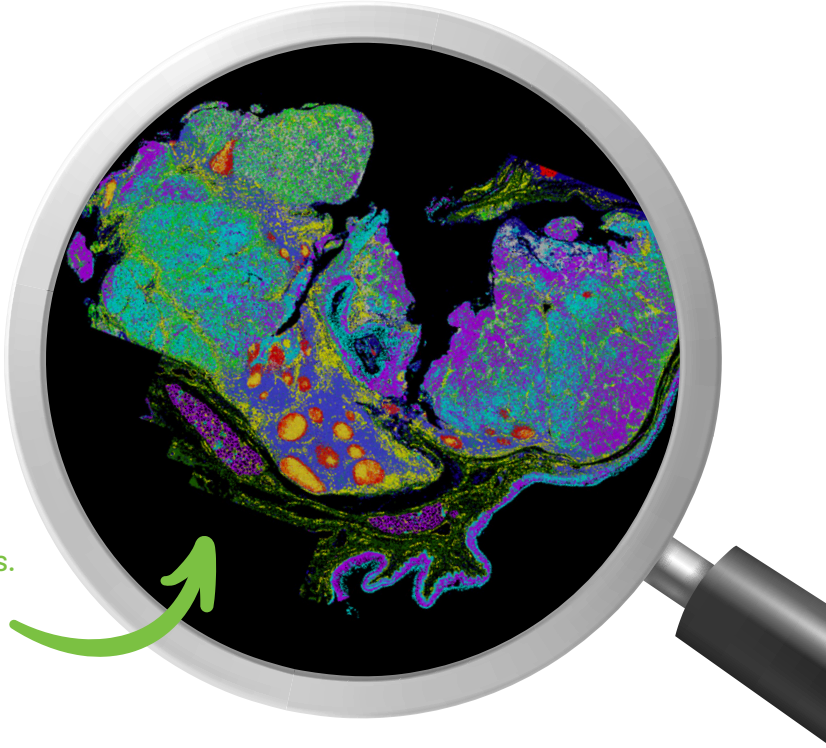
The cutting-edge technology our team of experts are using enables us to interrogate proteins and genes from tissue samples in their original locations, mapping millions of cells, while maintaining the tissue structure.

Mapping these cells, and their interactions with a host of pathological markers and diseases across a single intact tissue section, is facilitating the discovery of rare cell types, cellular 'neighbourhoods' and spatial functional states to explain why individual patients have varying degrees of success responding to treatments.

These new dimensions of data will help us understand these cellular interactions, informing our researchers how to personalise therapy.

Collectively, this information can identify new drug targets and distinguish patients likely to achieve the greatest benefit from therapy.

> ***"Spatial biology is the next frontier in medicine and biomedical sciences, providing new insights into the causes of diseases. I am so inspired that the QSBC, and Wesley Research Institute, has the vision to harness the power of spatial biology to help improve people's quality of life."***
>
> *- Dr Meg Donovan,*
> *Senior Research Officer,*
> *Wesley Research Institute*



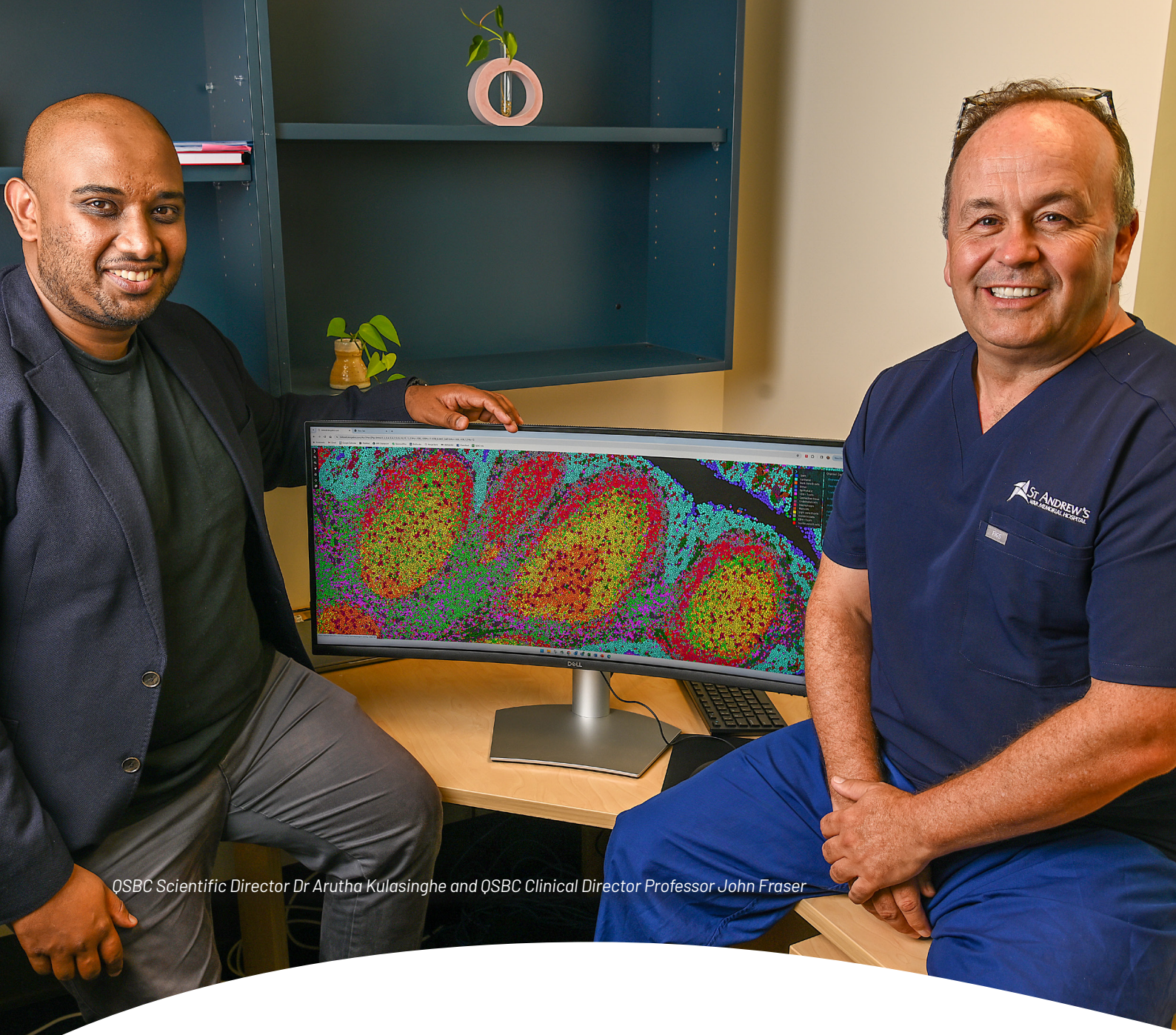
In this "cellular map" of a head and neck cancer sample, with the help of hundreds of biomarkers and spatial metrics, we can see that there are multiple tumour pockets, some of which responded to treatment where immune cells have infiltrated, as well as see where the tumours are in relation to blood vessels. These insights will allow clinicians to target weak points with combination therapy.

04

Personalised treatment plan

05

Improved health outcomes for that individual patient



QSBC Scientific Director Dr Arutha Kulasinghe and QSBC Clinical Director Professor John Fraser

Help us turn this unprecedented spatial biology research into life-saving treatment for patients sooner.

> *We are on the cusp of something tremendous. This is revolutionary medical research. It heralds a new era of personalised and effective treatment solutions for patients, offering the prospect of a brighter and healthier future for those battling cancer and other diseases.*

- Professor John Fraser,
Clinical Director,
Wesley Research Institute's QSBC

The right tools, the right time, the right people

> ***These technologies weren't available 50 years ago; they weren't even available 10 years ago. We've got the right tools at the right time to individualise therapies for cancer patients and beyond.***
>
> *- Dr Arutha Kulasinghe,*
> *Scientific Director,*
> *Wesley Research Institute's QSBC*

Spatial biology has peaked at the right time, marking a transformative era for our researchers. This milestone allows us to personalise therapies and embark on a spatial revolution, digitising information on an unprecedented scale.

Previously, our ability to scrutinise diseases was limited. Our advance in technology is akin to upgrading from traditional paper maps to the seamless navigation of a high-tech GPS system.

This is thanks to state-of-the-art spatial omics technology, including the **PhenoCycler®- Fusion System**. It is the only one of its kind within an Australian hospital and enables spatial phenotyping of countless cells at an extraordinary scale and speed.

The QSBC stands at the forefront nationally, steering the adoption of advanced discovery technology and its seamless implementation. By uniting experts from diverse fields— researchers, clinicians, and scientists—we ensure that our collaborative efforts yield the most favourable outcomes.

And now, you can join us on this journey.

PhenoCycler® – Fusion System, purchased thanks to the Vidyajey Foundation

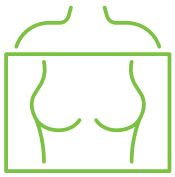
Revolutionising the way patients are treated

"The QSBC truly is the future of research. Every dollar people give goes towards understanding why certain therapies work in certain patients, across multiple diseases. The implications are broad, potentially revolutionising treatments for many disease types."

- Andrew Barron, CEO, Wesley Research Institute

Our cutting-edge approach, using advanced spatial phenotyping technology and pathology diagnostic techniques, holds the potential to reshape the way clinicians combat cancer as well as a host of other conditions.

The QSBC will focus initially on six core study areas, all with the aim of developing personalised therapies, and therefore better outcomes for patients:

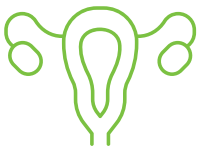


Better outcomes for breast cancer patients

Triple-negative Breast Cancer (TNBC) is one of the most aggressive forms of breast cancer. These cancers are more common in women under the age of 40 and tend to grow and spread faster, have fewer treatment options and worse prognosis. Tissue samples for new biomarkers associated with response to chemotherapy will be examined, with the hope of achieving better outcomes for patients.

More effective treatment for cardiovascular disease

Cardiovascular diseases remain the leading cause of death in Australia and worldwide. Currently, there are limited treatments for patients suffering chronic heart failure or end-stage heart diseases. There are also no reliable biomarkers to predict patient trajectory or outcomes. Spatial profiling will provide in-depth understanding of the interplay between various cell types within the heart, during different stages of heart failure development, and allow for more effective treatment.



Earlier treatment for ovarian cancer

Ovarian cancer is ranked 5th in cancer deaths amongst women, accounting for more deaths than any other cancer of the female reproductive system. Symptoms are often mild, and non-specific, making it hard to diagnose and treat early. New biomarkers are needed to identify the development and recurrence of ovarian cancer, so that patients can receive effective treatments earlier.

Protecting organs by improving sepsis prediction

Sepsis is a life-threatening condition caused by an extreme reaction to infection. It is the leading cause of death in critically ill patients and is listed as a global health priority by the World Health assembly. Spatial profiling will help analyse the biological mechanisms of sepsis, especially during the "golden hour of sepsis", where each hour delay in treatment reduces sepsis survival rates by 7.6%.

Understanding acute lung injury

Acute lung injury has been identified for more than five decades, yet there is no definitive treatment. One of the key challenges in finding an effective treatment is that there is a sub-population of patients who respond to treatment differently and we don't yet understand why. Spatial profiling will allow us to probe further into acute lung injury; new knowledge will be used to help guide personalised treatment for patients.

Insights into treatment across multiple cancers

In this robust discovery study, we will profile a multi-cancer tissue microarray composed of breast, colon, colorectal, bladder, lymph node, lung and prostate cancer. We will gain insights into which tumour types might best benefit from spatial profiling, and in turn the appropriate therapy response.

> *"We're making sure that a patient expected to die in ten years' time – doesn't."*

- Professor John Fraser,
Clinical Director,
Wesley Research Institute's QSBC

You can help change the lives of those affected by these diseases now, and in the future, by supporting the work of the QSBC. Be a part of medical innovation.

Be a part of medical innovation

"There is no other centre like this in the country—it's something that no one else is doing. Having this technology in a hospital creates that closer connection to patients."

- Andrew Barron, CEO, Wesley Research Institute

Thanks to the generosity of our philanthropic community, we have already purchased the instrument critical to digital spatial profiling—the PhenoCycler®-Fusion System, the first machine of its kind in an Australian hospital.

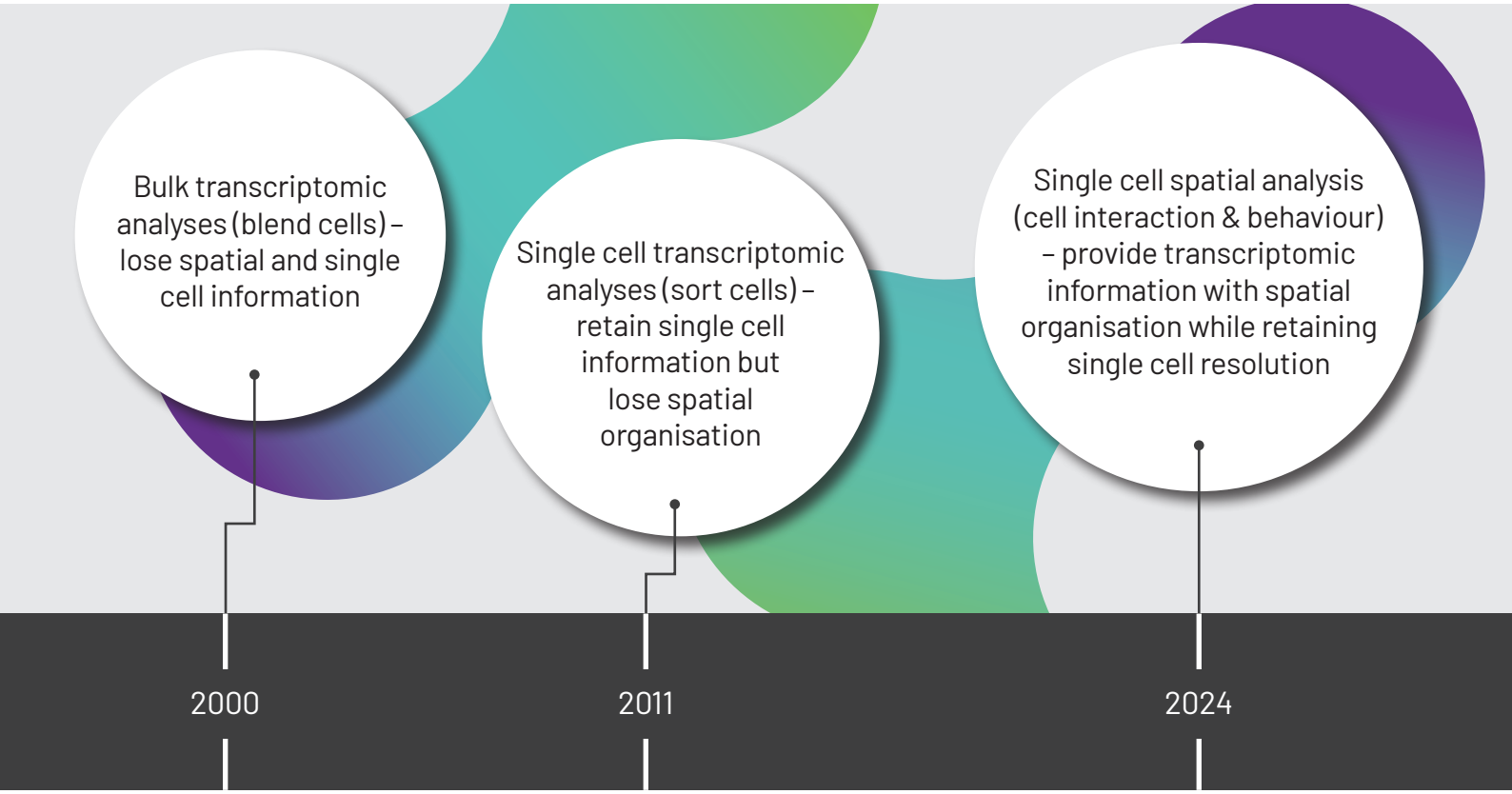
But this is just one component of our multi-year plan—a plan that will have an extraordinary impact on patient outcomes.

To utilise this innovative technology, and conduct the research to save lives— we need your help.

Our biggest funding challenge lies in ensuring the sustainability of our research long-term – the laboratory tools and equipment required to gather our life-altering data, and the people power behind the analyses wherein the answers to personalised therapies lie. These components are vital to the long-term, ongoing success of the QSBC.

Our greatest need is to secure funding for the first year of operations.

Beyond that, further investment will help us achieve our future goals of upgrading the lab and establishing a remote research precinct to enable major research initiatives and collaborations to amplify our global research endeavours.



Mapping hundreds and thousands of cells is a lengthy process.

With your help we can amplify our capabilities and ultimately save more lives sooner.

$35k – $100k per annum

Sponsor an emerging scientist through our scholarship program, nuturing the next generation of researchers and experts.

$65,000 per annum

Contribute to the future of personalised medicine by funding antibodies required to analyse tumours and develop targeted therapies.

From $135,000 per annum

Drive impact by funding a PhD fellow to conduct revolutionary exploratory research and reduce shortages in specialist areas, including implementation science, health economics and bio-medical domains.

$1 Million

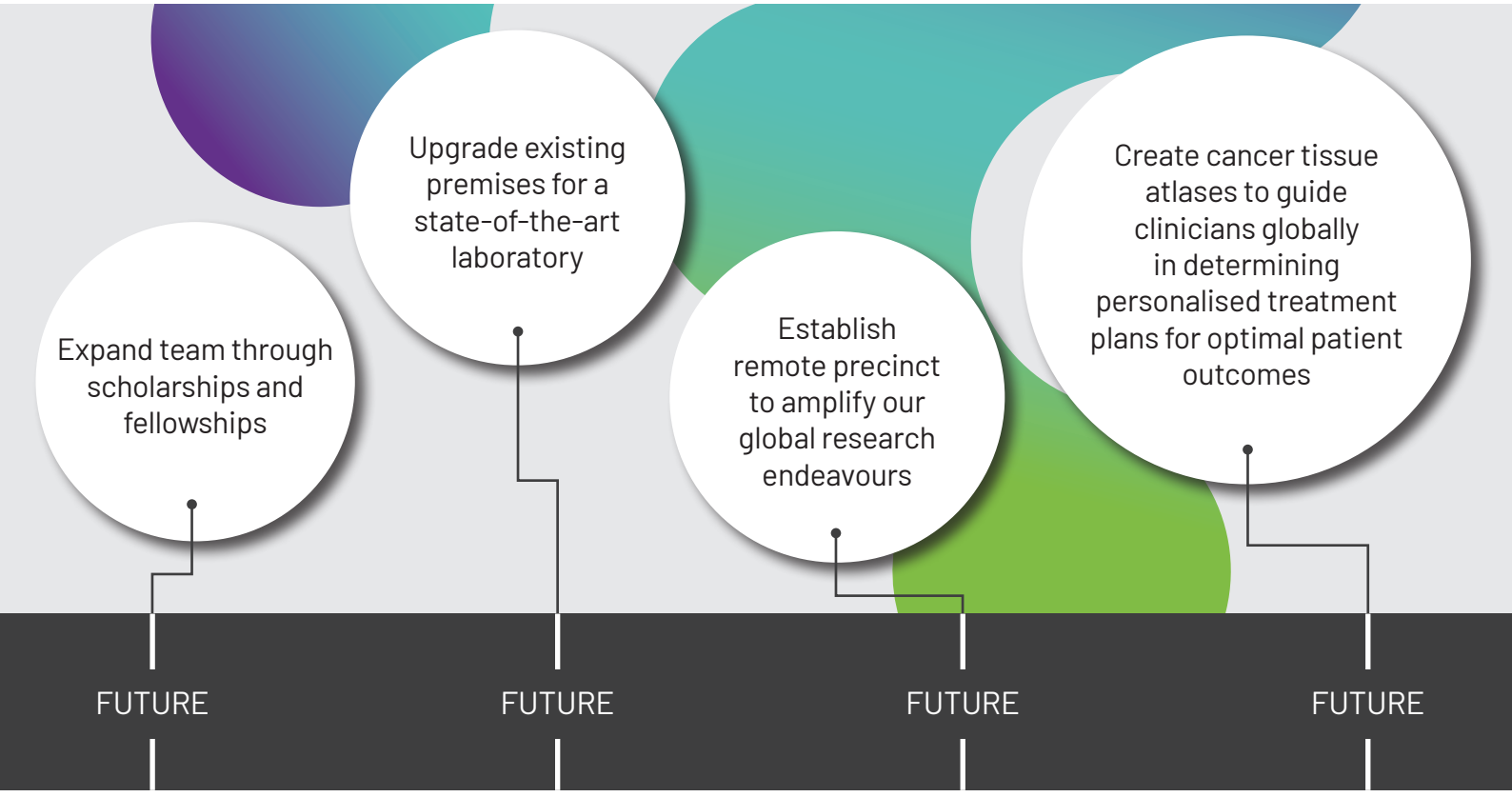
Keep us at the forefront of experimental research by upgrading our existing premises for a state-of-the-art laboratory and help us amplify our global endeavours by establishing a remote research precinct.

$2 Million+

Play a pivotal role in the creation of global cancer tissue atlases with predictive signatures to guide clinicians in determining personalised treatment for their patients to ensure optimal outcomes.

"Research comes and goes in waves, and every few years there is a topical area of interest. The QSBC is one of those areas that's not just topical, it's here to stay."

- Dr Sherman Leung, Head of Research Operations, Wesley Research Institute



Proud to be a part of something life-changing

Jeyakumar Janakaraj (JJ) and his family are no strangers to the Wesley Research Institute.

While it was a life-threatening illness that initially connected them to WRI, the relationship that formed grew and is stronger than ever 15-years later.

"We very quickly saw that passion which the researchers and clinicians work with, and it made us realise how important research is for treating diseases and in helping patients live longer and healthier lives.

We knew that we wanted to be involved," said JJ.

Through their family foundation, the VidyaJey Foundation, JJ, Vidya and Sandra support WRI's ground-breaking initiatives, including the QSBC.

"I think this is going to be a game-changer for Australia, especially as we know the dedication of the people who are working on it.

"To know that we've been a significant part of this cutting-edge research, to help kick-start the whole thing, is humbling," says JJ.

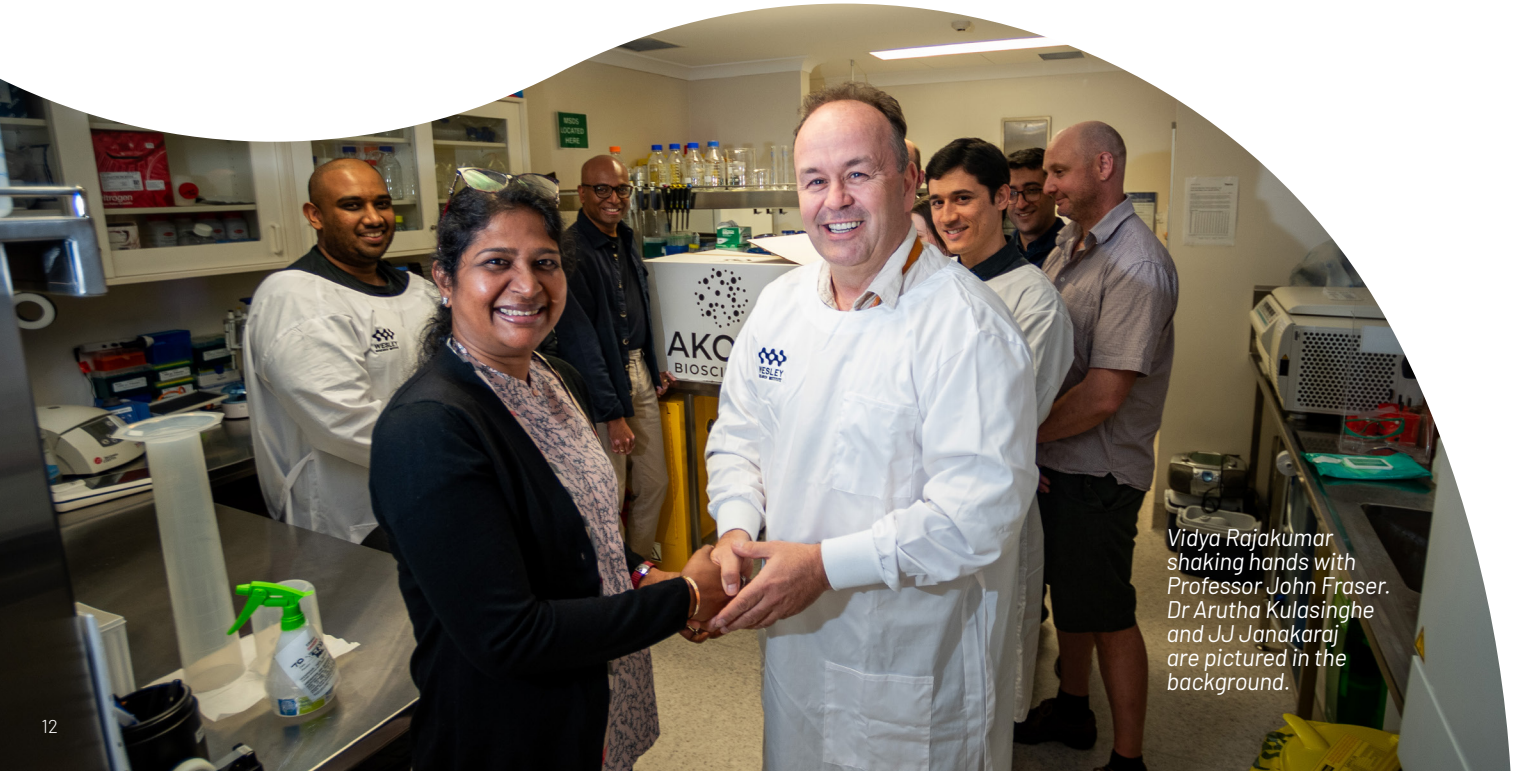
JJ says that supporting the work of WRI has been incredibly rewarding.

"We are sure that it can be life-changing for everyone who touches this great place. It's quite remarkable.

"For anyone considering giving to the Queensland Spatial Biology Centre, know that your giving is going to bring you more joy than you ever receive because the impact you will have on society, the community, and the people around you, will be profound.

"We genuinely believe that we will support WRI for life."

Will you be part of this revolutionary research too?



Vidya Rajakumar shaking hands with Professor John Fraser. Dr Arutha Kulasinghe and JJ Janakaraj are pictured in the background.

The time to act is now

Wesley Research Institiute is a small agile team, with a clear sense of purpose and long-term vision in achieving excellence and innovation in health outcomes.

From our humble beginnings in 1994, decade by decade, we have built on our expertise to drive better health in our communities.

Each year, our dedicated team contributes to impactful research and medical breakthroughs through:

- funding hundreds of research projects, investing millions into priority areas, such as Coeliac Disease and Immune Health, spatial biology (cancer and other diseases), aged are, critical wound care, mental health services and neurological disorders
- adding thousands of samples to our Biobank for biomedical research, contributing to large international projects
- producing hundreds of high-impact internationally recognised publications
- engaging hundreds of clinical trial patients to offer new and emerging treatment options
- partnering with corporations, Trusts and Foundations, other research organisations, universities and the overall community to further our reach and capabilities
- sharing our knowledge with colleagues around the world to support global progress on improving health
- nuturing the next generation of researchers and experts through funding scholarships and fellowships

The Queensland Spatial Biology Centre was launched in early 2024 and the team are already pioneers in reshaping the future of healthcare. Our biggest funding challenge lies in ensuring the sustainability of our research long-term – the laboratory tools and equipment required to gather our life-altering data, and the people power behind the analyses wherein the answers to personalised therapies lie.

Mapping hundreds and thousands of cells is a lengthy process. With your help we can amplify our capabilities to run more samples to create robust predictive signatures to identify if a drug will work or not, and ultimately save more lives sooner.

We would love to hear from you.

To pledge your support, or find out more, get in touch:

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