Inspired by Discovery.
Driven by Purpose.
Welcome

When racehorse trainer Jack Holt died in 1951, leaving 200,000 pounds to establish SVI, he could not have imagined the impact of his generosity.

In 2023, SVI celebrated 65 years since our lab doors first opened. Since that time, numerous fundamental scientific discoveries that have profoundly influenced our understanding and treatment of disease have been made, countless young students have been educated and set out on their own career paths, and scientists have seen their careers thrive.

This Research Review celebrates the achievements of our dedicated staff and highlights their drive to make a difference – inspired by discovery and driven by purpose.

This year has been a remarkable one.

Notably, in the last 12 months, we welcomed two new Lab Heads to the Institute, Dr Irene Gallego Romero and Professor André La Gerche.

Irene and her team in the new Human Genomics & Evolution Lab are focussed on exploring the genetic differences between human populations, advancing personalised medicine and championing global health equity.

André is internationally recognised as an expert in exercise cardiac imaging, sports cardiology and pulmonary vascular physiology. With his team in the new Heart, Exercise and Research Trials Lab, he is working to embed state-of-the-art personalised diagnostics and therapeutics within clinical care. André’s appointment is powered by a partnership with the Victor Chang Cardiac Research Institute in Sydney, which like SVI, is a member of the St Vincent’s Health Australia family.

The last 12 months also saw the release of the results from our type 1 diabetes clinical trial. Published in the prestigious New England Journal of Medicine, the trial showed, for the first time, that a drug commonly prescribed for the treatment of rheumatoid arthritis could be used to prevent the progression of type 1 diabetes. You can read more about the work later in this Report.

Our scientists also had an amazing result in terms of funding from the year’s National Health and Medical Research Council (NHMRC) grant rounds, with more than $11 million in grants awarded. This includes three prestigious Investigator Grants to Professors Natalie Sims, André La Gerche and Dr Harriet Dashnow, along with seven Ideas Grants, of which two were awarded to Professor Louise Purton.

In addition to seeking funding through conventional grant programs, we continue to explore alternative funding avenues, capitalise on commercial opportunities and intensify our philanthropic endeavours. Last year saw a particularly generous pledge of support from the Jacobsen Family Foundation, in the form of $2.5 million to fund work into Lewy Body Dementia in Professor Michael Parker’s Structural Biology Lab.

As the building emerges on the corner of Nicholson St and Victoria Parade, we are becoming increasingly excited about the potential embodied in the Aikenhead Centre for Medical Discovery (ACMD). This initiative will give us the opportunity to participate in new multi-disciplinary projects to solve real-world healthcare problems and improve patient outcomes.

We are also continuing to strengthen other collaborations, especially with other members of the St Vincent’s family, including the Chang Institute and our campus partner, St Vincent’s Hospital Melbourne.

We thank our philanthropic donors, whose unwavering support for ‘science with purpose’ serves as a constant source of inspiration and motivation. Their generosity empowers our scientists to explore innovative ideas and initiatives, extending our ability to transform lives through medical discovery.

We are grateful to other stakeholders for their continued support: the State Government of Victoria (through the Operational Infrastructure Support Program), the Australian Government (through the National Health and Medical Research Council, the Medical Research Future Fund and the Australian Research Council), the Board of St Vincent’s Health Australia and the Trustees of the Mary Aikenhead Ministries.

We also appreciate the continued dedication and professionalism exhibited by the members of the Board and the Foundation Board and extend to them our heartfelt gratitude for their invaluable contributions.

We believe in the transformative power of science to profoundly benefit society as a whole. Thanks to you for your interest in, and contributions to, this ambitious endeavour.
Year at a glance

239
Staff

66
Students

21
Laboratories

3
New Laboratory Heads

$24.9m
of research grants awarded, highest ever

$7.1m
in philanthropic income

643
news items in 11 different countries

Science, with purpose.

Infectious disease
We are ensuring the accuracy of testing for infectious disease – whether it be influenza, Hepatitis, HIV or COVID-19.

Bioinformatics
We are turning complex data into new knowledge to improve human health with specialised expertise, new data generation platforms and analysis tools.

Regenerative medicine
We are using regenerative approaches to protect and repair tissue following disease, trauma and cancer treatment.

Healthy Ageing
We are finding new ways to address the challenges associated with osteoporosis, neurodegenerative diseases, type 2 diabetes and heart disease.

Immunology
We are researching the immune cells and signalling pathways involved in inflammation and immune responses, with a major focus on type 1 diabetes.

Cancer
We are investigating why cancer develops, and finding new ways to treat, diagnose and prevent it.

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Cancer
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Year in focus

New hope for type 1 diabetes
Published in the prestigious New England Journal of Medicine, the results of SVI’s type 1 diabetes clinical trial in late 2023 drew the world’s gaze to SVI.

In the trial, a team led by Professors Tom Kay and Helen Thomas showed that type 1 diabetes can be prevented from progressing by taking a daily tablet of a widely used rheumatoid arthritis drug.

What began 30 years ago as an exploration between Tom and Helen into the widely used rheumatoid arthritis drug.

In the trial, a team led by Professors Tom Kay and Helen Thomas showed that type 1 diabetes can be prevented from progressing by taking a daily tablet of a widely used rheumatoid arthritis drug.

The results of the trial, published in the prestigious New England Journal of Medicine, showed that the drug, which is currently used to treat rheumatoid arthritis, can also prevent type 1 diabetes.

What began 30 years ago as an exploration between Tom and Helen into the potential of the drug for treating type 1 diabetes has now led to a major breakthrough.

The team found that the drug, which is currently used to treat rheumatoid arthritis, can also prevent type 1 diabetes.

In 2023, Natalie was also awarded an Australian and New Zealand Bone Mineral Society Career Achievement Award, recognising her service to and within the bone and mineral fields.

Heart size versus heart health
Professor André La Gerche, Head of SVI’s new Heart, Exercise, and Research Trials Lab was awarded more than $2.7 million for his work on heart disease diagnosis and treatment.

André will be examining the potential genetic and environmental causes of small heart syndrome, a condition which is characterised by shortness of breath and exercise intolerance.

“Small heart syndrome impairs a person’s ability to go about their daily lives,” said André.

“It also has a direct impact on their body’s ability to cope with illness. If you can’t get enough oxygen to your muscles, then the whole system fails.”

Age-related bone research receives funding boost
Professor Natalie Sims was awarded a prestigious NHMRC Investigator Grant worth more than $2.5 million for her research into the causes of age-related bone fragility.

Commonly occurring in the hip and wrist, fractures in older people are a major public health issue because current treatments do not help everyone with fragile bones.

“We’ve known for almost 50 years that cortical bone – a bone’s hard outer layer – gets more porous as we age, but we still don’t understand how this happens, what drives it, or how to slow down this process,” Natalie explains.

Natalie will work with an international team using cutting-edge techniques to unpick the intricacies of how bone material itself develops and degrades through our lives.

Brain protein powering weight gain
In 2023, Dr Kim Loh was one of only 100 scientists awarded an ARC Future Fellowship, for his project focusing on a protein in the brain that regulates energy supply to the entire body.

“Obesity is directly connected to conditions like type 2 diabetes and cardiovascular disease. It affects 30% of Australian adults and costs $11 billion a year to treat,” he said.

“One of the hardest things is that losing weight and keeping it off is really difficult. Our goal is to develop new, effective and lasting weight management strategies to combat obesity.”

In 2023, Kim was also awarded an NHMRC Ideas Grant to investigate a potential new treatment for type 2 diabetes.

In 2023, Natalie was also awarded an Australian and New Zealand Bone Mineral Society Career Achievement Award, recognising her service to and within the bone and mineral fields.

Artificial intelligence powered precision for breast cancer
After receiving close to $3M from the Federal Government’s Medical Research Future Fund, a clinical trial to support an Australian-led research study examining the use of artificial intelligence in breast cancer screening will launch in 2024.

The BRAIIX Project prospective clinical trial will investigate whether an artificial intelligence reader, developed by Dr Davis McCarthy and the BRAIIX team, can be used to improve the accuracy, efficiency and overall patient experience of women undergoing mammograms to screen for breast cancer.

The scientists hope to improve outcomes for more than 20,000 Australian women who are diagnosed with breast cancer each year.

A mammogram is a specialised X-ray of the breast tissue, used to screen for breast cancer.

Members of the Jacobsen family with Karen Inge, SVI Foundation Chair.

Transformative philanthropy fuels Lewy Body Dementia research
In late 2023, the Jacobsen Family Foundation gave research into dementia at SVI a $2.5 million boost, with a 5-year pledge to research in the Structural Biology Laboratory, headed by Professor Michael Parker. The funding, directed specifically towards finding new solutions for the treatment of Lewy Body Dementia, will support work in the lab aimed at manipulating the cells of the immune system to help clear the brain of toxic proteins.

“This truly transformational gift provides us with a tremendous opportunity to accelerate the pace of discovery and make significant strides towards finding new solutions for Lewy Body Dementia, which affects more than 100,000 Australians,” said Professor Tom Kay.

Professor Louise Purton is working to find new treatments for blood cell diseases.

Better understanding of blood cancer
Professor Louise Purton’s outstanding work on blood cells was recognised in 2023 with the award of two NHMRC Ideas Grants. These will allow Louise to unravel the cause of changes in the production of blood-forming cells which can lead to complications, including blood cell cancers. She will also work on identifying the changes occurring in one of the non-blood cell types in the blood cell-forming process that results in reduced production of red cells and platelets.

“This funding will allow us to understand how blood cell diseases occur and, in turn, identify better ways to treat patients with different types of blood cell diseases,” said Louise.

Documents stored in SVI’s Biobank from participants in the type 1 diabetes clinical trial.

The stars are rising for young researchers
Thanks to visionary philanthropists, three young researchers received Rising Star Fellowships in 2023.

Supported by a Fellowship from the Marion & E.H. Flack Trust, Dr Jarmon Lee is focussed on developing new treatments for a form of heart disease that affects people with Friedreich Ataxia.

Awarded the Christine Martin Fellowship, funded by Spont Foundation, Dr Jian Kang’s research is laying the groundwork for potential new treatments for ovarian cancer.

Dr Kiryu Yap, supported by the L.E.W. Cartey Signature Grant, is focused on liver disease, a painful, debilitating illness that is often fatal.

Revealing the cell’s invisibility cloak
Professor Carl Walkley and Dr Jacki Heraud-Farlow published a paper in the journal Molecular Cell in 2023, in which they described their work on the molecular functions of the protein ADAR1. Mutations in ADAR1 are one cause of the rare genetic disorder Acord-Goutières Syndrome, a progressive neurodevelopmental disease affecting children.

“The normal role of ADAR1 is to create an ‘invisibility cloak’ to prevent a person’s immune system from reacting to a portion of their own genetic material that looks very similar to a virus,” says Jacki. “When ADAR1 is mutated, the invisibility cloak fails, resulting in an autoimmune response against the affected person’s own tissues. Because of its power over the immune response, drugs that target ADAR1 are thought to have the potential to enhance cancer immunotherapies.”

In their paper, the team delineated, for the first time, two distinct inflammatory pathways controlled by ADAR1. This better understanding of how ADAR1 works will pave the way for development of new and more precise therapies.
Wildely optimistic: the search for solutions to multiple myeloma

Associate Professor Elaine Sanij has had a bumper year. Over the last 12 months, she has received major grants from the NHMRC, Cancer Australia and the U.S. Department of Defense, funding her well established research into ovarian cancer.

What makes her particularly excited at the moment is a new research theme in her lab, which is devoted to finding new solutions for the blood cancer, multiple myeloma.

This research is enabled by philanthropic support and by grants awarded to both Elaine and to her postdoc Dr Jian Kang, SVI’s Christine Martin Fellow. This includes grants from The Tour de Cure Foundation and The Barrie Dalgleish Centre for Myeloma and Related Blood Cancers.

The Dalgleish Centre is a partnership of academic organisations, including Peter Mac, SVI, and St Vincent's Hospital, formed thanks to a bequest left by psychologist Barrie Dalgleish. The Centre aims to focus the collective talent of cancer researchers across Melbourne on the problems posed by multiple myeloma.

In multiple myeloma, immune cells in the bone marrow transform into cancerous cells that grow out of control, crowding out normal cells that help fight infection.

Elaine says that symptoms of multiple myeloma vary from person to person. In the early stages of disease, there are often no obvious ones.

“The disease isn’t thought to be hereditary and its causes are currently unknown,” she says.

It was almost by sheer luck that multiple myeloma patient Karen Wilde was given an accurate diagnosis for a pain in her leg that just wouldn’t go away.

“I thought I had injured myself but the pain lingered a bit too long so I went to see a GP,” said Karen.

“My doctor suspected it was something a bit more serious than a strained muscle because she had recently diagnosed someone else with multiple myeloma.”

“As a physiotherapist, I had always been conscious of staying very fit and healthy. So, when my doctor said that if someone like me could have multiple myeloma, then anyone could, it struck a chord.”

Karen’s refusal to allow the disease define her and interest in finding solutions have led her to become involved in clinical trials, raise funds for multiple myeloma research and to forge a connection with Elaine at SVI.

“Understanding the problems of multiple myeloma from the perspective of someone who has first-hand experience really helps us to shape our research program. I have been blown away by Karen’s optimistic nature and drive to make a difference,” says Elaine.

Elaine and Jian are working to understand how multiple myeloma cells drive the progression of the disease and find ways to evade treatment.

“We are doing this using state-of-the-art technologies that allow us to compare myeloma cells that are sensitive to treatments to ones that have developed resistance. This will help us understand the difference between the two. We are also looking at genes associated with resistance to therapy.”

Australia has one of the highest rates of multiple myeloma in the world, with around 22,000 Australians currently living with the disease, and 1,100 dying each year from its effects. The disease is generally considered incurable.

Neither Elaine nor Karen are willing to accept this.

“I reject that word, ‘incurable’,” says Karen. “There is so much work being done by wonderful people like Elaine that I refuse to accept that we won’t find a cure.”

“It might not be found in my lifetime, but I don’t doubt that it will be found.”

- Karen Wilde

Elaine with Karen Wilde and PhD student Kezia Gitareja
The human body is flooded with a handy little enzyme called adenosine monophosphate-activated protein kinase (or AMPK for short), which acts as our cells’ fuel gauge. It’s more than just a gauge though – when it senses an energy surplus, it tells a cell to store energy and create molecules like fat, while in a deficit it instructs cells to use their stores.

Although quite a lot is known about AMPK and its functions, in large part thanks to work done over decades at SVI, what is yet to be discovered is a precise method to either switch AMPK off or on in specific cells. This is the goal of research in Associate Professor Jon Oakhill’s Metabolic Signalling Lab.

“We know that if you can turn AMPK on in certain cells, you can potentially treat conditions like type 2 diabetes, but equally, if you could switch it off in the brain you could stop the damage done by stroke,” he said.

“The problem is that AMPK is in every cell. For something like stroke, you only want AMPK to be turned off in very specific areas so that you don’t cause a cascade with off target effects.”

Jon’s research into potential drugs that can be used to turn the enzyme on or off has implications for a wide range of diseases, including cancer, liver disease, type 2 diabetes and neurodegeneration.

Capitalising on this, in 2023 Jon was awarded an NHMRC Synergy Grant as part of a collaboration with James Cook University in Queensland to find new treatments for aortic aneurysm, a deadly disorder that causes weakening of the main abdominal artery.

He also was recipient of a Heart Foundation Vanguard Grant, a Diabetes Australia Grant and an NHMRC Ideas Grant to test new avenues of treatment for heart disease, for diabetes and for non-alcoholic fatty liver disease.

“We are working closely with medicinal chemists to develop drugs that can specifically target AMPK in certain cell types to avoid the problems that occur if AMPK is turned on or off in every cell.”

As an internationally recognised expert on AMPK, Jon is building on the work of giants in the field like SVI’s Professor Bruce Kemp, who was the first in the world to sequence the enzyme.

“Bruce’s work broke new ground on our understanding of the role kinases like AMPK play within an individual cell. It is thanks to pioneers like him that we understand the potential of AMPK.”

“What we have to do now is unlock it.”

There are a surprising number of parallels between the Lions Clubs and SVI. Most importantly, both organisations are driven by a desire to improve humanity. Coincidentally, the first Lions Club in Victoria was formed at the same time that SVI’s benefactor, Jack Holt, left a generous bequest of 200,000 pounds to establish the Institute.

Members of the Lions Club first visited SVI in 2022, on the urging of postdoctoral scientist Dr Martha Blank, who has been part of Lions since 2018.

Since that time the relationship has blossomed, resulting in a commitment from Lions to contribute towards a cutting-edge piece of equipment, important for Institute research into cancer, type 2 diabetes and osteoporosis.

Lions in Victoria have been at the forefront of significant projects, supporting many medical research projects in the State. They are continuing this legacy with their support of SVI.

Associate Professor Jon Oakhill has enjoyed meeting with representatives of Lions from District 201V1-4 and is grateful for the support pledged by the Clubs in this District.

“Something that shines through the work of Lions, and which resonates with me, is the desire to make a difference.” says Jon.

“Success in medical research requires the input of many, from students at the coalface in the lab, through to philanthropists. Support from community organisations like Lions, by their willingness to invest in our purchase of cutting-edge equipment, is instrumental in helping us to transform lives through medical research.”
When Kiryu Yap met Geraldine Mitchell 15 years ago, Geraldine assumed that their acquaintance would be brief. “Kiryu came here to do his Honours in my lab as a young medical student and I thought that once he finished, he’d focus on being a clinician and I would never see him again. But then he came back with an idea for a PhD,” recalls Geraldine with a laugh.

Although he had originally imagined a future in the surgical suite, Kiryu found that he was fascinated by discovery-based science. In 2023, Kiryu was appointed as co-Lab Head with Geraldine of the Vascular Biology Laboratory in the Institute’s O’Brien Department.

The two share expertise in regenerative medicine – the field aimed at harnessing the body’s own regenerative capabilities to restore function to tissues that have been damaged by disease, injured by trauma or worn out over time.

“Kiryu is focused on liver disease, and I am interested in the problem of wound healing. But we are both using the potential of stem cells. This means that as co-lab Heads, while the work we do overlaps quite a lot, it also diverges,” says Geraldine.

As a medical doctor, Kiryu has seen the problem of liver disease up close. “Non-alcoholic fatty liver disease affects more than 25% of Australians, including children, and this is set to grow,” he says.

Once a liver has become irreversibly scarred and begins to fail, often the only remaining option is a liver transplant. Besides the fact that donor livers are hard to come by, Kiryu says that for many people, they are too sick to survive surgery by this point.

“It’s ironic that in order to heal a wound, particularly in people with wounds that haven’t healed on their own, the best current treatment requires the infliction of a further wound,” says Geraldine.

Geraldine’s work, funded by a grant from the Federal Government’s Medical Research Future Fund in 2023, aims to offer a bioengineered alternative to surgery, using a patient’s own cells grown to form a skin flap, with blood vessels incorporated to enable better growth.

“We’ve been lucky to also receive funding for our work from the Stafford Fox Foundation, the O’Brien Foundation and the L.E.W. Carty Charitable Fund, as well as a number of other philanthropic and government funded grants,” says Geraldine.

Also growing is the problem of wound healing, the focus of Geraldine’s research. Each year in Australia, around 60,000 people require painful and costly surgery to treat difficult skin wounds. The operation involves harvesting a thick flap of skin from somewhere else on the body to cover the original wound.

“A wound that won’t heal is a source of pain and stress, and poses a particular problem in the elderly and in people affected by diseases like type 2 diabetes,” says Geraldine.

Nestled in incubators in the Vascular Biology Laboratory are dishes filled with different combinations of cells and growth factors at various stages of growth. Together, the two scientists are focused on combining the right types of cells, at the right time, with the right growing medium.

“We can also take it a step further with the work being done on gene editing by other labs here at SVI, which will potentially allow us to change specific genes in the cells to make the resulting tissue more robust and less prone to disease,” Kiryu says.

Thanks to their now 15 year-long partnership, treatments once the stuff of science fiction – repairing stubborn wounds with a person’s own specially grown skin, or replacing liver with one grown from their own cells – are a step closer to reality.
In 2023, Professors Tom Kay and Helen Thomas celebrated 30 years of working together. In the same year, they also published the results of their type 1 diabetes clinical trial which offers hope for the improved treatment of the condition.

“When I started working with Tom back in 1993,” says Helen, “my first project was looking at how insulin-producing cells in the pancreas were recognised by the body’s immune system in type 1 diabetes.”

“It was some of this work that formed the basis of our clinical trial.”

Type 1 diabetes is a chronic autoimmune disorder in which the body’s immune system destroys its own insulin-producing beta cells. As a result, people with the condition are not able to produce enough insulin, a hormone that regulates blood sugar levels, and they require daily insulin injections or the use of an insulin pump to survive.

In their world-first study, Tom, Helen and their team showed that a commonly prescribed rheumatoid arthritis drug called baricitinib was able to suppress the progression of type 1 diabetes in people who commenced treatment soon after diagnosis.

“When someone is first diagnosed with type 1 diabetes they often still have a substantial number of insulin-producing cells present. We wanted to see whether we could protect further destruction of these cells by the immune system,” says Tom.

“We showed that baricitinib is safe and effective at doing exactly that.”

This ground-breaking research shows promise as the first disease-modifying treatment of its kind for type 1 diabetes that can be delivered as a tablet. Eleven years old when doctors told her she had type 1 diabetes, Anna was one of the 91 people who put their hands up to be enrolled in the trial. Her brother, Max, now 20, was also 11 at diagnosis.

Their mum, Sarah Jane, said, “When Anna was diagnosed, I was sad, because I see it as a lifelong condition.”

Sarah Jane describes the study as ‘intensive’ and while they don’t know yet if Anna was on the trial drug, baricitinib, or a placebo, she said one benefit of being on the trial was that it provided them with more medical support.

“We are very optimistic that this treatment will become clinically available.”

Sarah Jane said, “While we wish a treatment to prevent or slow down the progression of the condition was further down the line, we’re glad Anna had the opportunity to potentially change someone else’s future experience with type 1 diabetes.

She adds simply, “I’m grateful that SVI’s researchers aren’t giving up.”

The clinical trial was funded by JDRF, including through the JDRF Type 1 Diabetes Clinical Research Network. Partners included The Royal Melbourne Hospital, St Vincent’s Hospital Melbourne, The Royal Children’s Hospital and The Women’s and Children’s Hospital in Adelaide.
A connected world: Improving infectious disease testing

Every day around the world, millions of people are tested for infectious diseases – whether it be influenza, Hepatitis, HIV or COVID-19. And as we all now know too well, keeping us safe and well relies on the accuracy of this testing.

SVI’s National Serology Reference Laboratory (NRL) is designated by the World Health Organisation (WHO) as a Collaborating Centre for diagnostics and laboratory support for blood borne infections. The division is one of only 14 laboratories globally authorised to evaluate assays for testing for infectious diseases.

This year marks the half-way mark of a Department of Health funded 5-year longitudinal study to better understand the impact of human T-lymphotropic virus type 1 (HTLV-1) infection on the Australian indigenous population. HTLV-1 is a virus that causes a chronic infection which damages the immune system. It is transmitted via blood and body fluids, including from mother to child via breast milk. Infections can cause a range of diseases leading to chronic ill health, disability and reduced survival. The virus is particularly prevalent in Central Australia, which has some of the highest rates of HTLV-1 infection in the world.

The aim of the study, carried out in collaboration with the Baker and Kirby Institutes, is to determine the prevalence of HTLV-1 infection in different communities and to assess the health impacts of viral infection within individuals over time. Over the last 2½ years, more than 1200 participants have provided informed consent (in their own language) and have been recruited into this study, which covers communities in a 1000 km² region within the NT and WA.

This year, NRL scientists also worked on a project commissioned by the Foundation for Innovative and New Diagnostics, which is aimed at delivering quality assurance programs for COVID-19 Rapid Antigen Tests in a community setting in 10 countries across Africa, Pacific Islands and South-east Asia. The work identified that some of these countries had purchased test kits that were not fit for purpose. This led to withdrawal of the kits and a review of selection processes by those Ministries of Health. NRL’s quality assurance programs for Point-of-Care Testing are now being transitioned into routine services and made more widely available.

As COVID-19 showed us, the effectiveness and accuracy of testing for infectious disease is critical to protect life, and our way of life.
With every breath you take, the delicate air sacs in your lungs are filled with oxygen. Each of the 300 million or so sacs in a healthy set of lungs are surrounded by capillaries that facilitate the transfer of the oxygen into the bloodstream.

For this process to occur, the tissue that makes up the lungs must be elastic and flexible, able to be fully inflated with each breath.

In someone with idiopathic pulmonary fibrosis (IPF), the thin lacy walls of the air sacs become stiffened and thick with scar tissue, and unable to be filled with air. People with the condition initially experience shortness of breath.

IPF can progress very quickly and, without intervention, is fatal.

"'Idiopathic' means unexplained," says Dr Davis McCarthy, "We use the term when we can’t pinpoint a cause for a condition."

Davis and his collaborators have recently published a study in *Nature Genetics*, which they hope will help better understand what goes wrong in IPF, with the potential to further the development of therapies that treat the causes of the disease, as opposed to its symptoms.

Kathleen’s mother, Margaret, was 64 and had only just retired from nursing when she was diagnosed with the condition in 2019.

"Mum loved the water and swam 20-30 laps every day, 7 days a week. She noticed that she was feeling breathless and finding it harder to do."

For about 12 months, Margaret struggled to get a definitive diagnosis, facing uncertainty and frustration.

"She had a huge number of tests and was misdiagnosed with something else before she was finally told it was IPF," Kathleen says.

On hearing that her Mum had IPF, Kathleen and her family says that it was not the diagnosis, but rather the prognosis that was the shock.

"Mum was told that she had 5 years at most, and there were no real treatments available. Sadly, she died just 2 and a half years later."

"The last 6 months of her life were devastating. She spent a huge amount of time in and out of ICU and had very little quality of life. We organised a nurse at home to help her, but towards the end, she had to go into care."

"Because this was during Covid, and I was living in Melbourne and Mum in Queensland, I sadly didn’t get to introduce her to her new granddaughter before she passed away,” says Kathleen.

Over 1,250 Australians are diagnosed with IPF every year, most of whom are between the ages of 50 and 70 years old.

Davis says that while there are some new treatments that can slow the progress of the disease, the only current effective therapy is lung transplantation, which has limited availability and in which one set of medical problems is swapped for another.

“Our study is the first to examine exactly what is happening in individual cell types in the lung of people affected by the condition,” said SVI’s Dr Davis McCarthy, who co-led the research with his collaborator Dr Nicholas Banovich from the Translational Genomics Research Institute and colleagues at Vanderbilt University Medical Center in the U.S.

"In recent years, it has become clear that genetic factors contribute substantially to a person’s risk of developing IPF, but the exact influence of these genetic variations has not been well understood,” Davis says.

The team sampled lung tissue taken from 116 people, 67 of whom had the lung disease, and examined the genetic factors that influence how genes are turned on and off at a single-cell level, within 38 different individual cell types in the lung.

They showed that there were different factors found either only in healthy lung tissue or only in diseased lung tissue, and that these were highly cell type specific. This suggests that these factors may be important contributors to disease.

The study is the first to use single-cell genomics to study genetic regulation of gene expression in complex, solid, primary human tissues – in this case, the lung – pioneering new methods for identifying genetic causes of disease.

Kathleen reflects on the dire prognosis of IPF, saying, "With the cause still to be identified, it’s not surprising that there are no great treatments. For the treatment of cancer, medical advances have been able to provide some hope. For IPF, there’s no hope.”

With their results, Davis and his team are taking the first steps to provide just that.
Financial Snapshot

**INCOME**
- Competitive research grants: 36% 13,634,802
- Australian Government infrastructure support: 5% 1,958,815
- Victorian Government infrastructure support: 4% 1,644,502
- Philanthropy (legacies, bequests, donations): 19% 7,057,179
- Contracts and other income: 33% 12,453,418
- Investment income: 3% 1,072,901

Total Income $37,821,617

**EXPENDITURE**
- Research: 51% 20,635,876
- Contract services: 22% 8,945,364
- Transfers to collaborators: 8% 3,051,834
- Building operations: 2% 916,839
- Administration: 14% 5,633,789
- Foundation: 2% 877,950
- Commercial development: 1% 463,654

Total Expenses $40,525,306

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- Mr Michael Burn
- Ms Melanie Eagle
- Ms Karen Inge
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- Ms Kallie Blauhorn (Foundation Board)
Thank you

“We are grateful to all of our generous supporters, including our government and organisational allies. Your commitment will benefit Australians for generations to come.”
Professor Tom Kay
Director

Scan to donate

The tools to transform lives
Ground-breaking medical research takes more than skill. It takes the passion and commitment to push the boundaries. And it requires access to top technologies. Without this, the ideas and theories generated by even the brightest minds can never be translated into effective treatments. Donors to The Catalyst Circle provide critical support to fund vital equipment used by SVI’s researchers.

“I am very grateful for support from the Catalyst Circle, which in 2023 allowed us to purchase a piece of equipment that is instrumental in recent exciting work we are doing on developing a new, more accurate method to determine if someone is at high risk of type 1 diabetes.”
Associate Professor Stuart Manners, Head of the Human T Cell Lab

Commitment to better outcomes
SVI has loyal supporters who direct their donations to specific areas of research in which they have a passionate interest. These donors help fund research into diseases as diverse as breast and ovarian cancer, Fanconi Anaemia, type 1 diabetes, lipoeukena, heart disease and osteoporosis.

“Support from people who have family members affected by type 1 diabetes has been instrumental in helping to progress our research over many years. This led to the successful completion of our clinical trial in 2023, and will continue to help us on our mission to improve outcomes for people with type 1 diabetes.”
Professor Helen Thomas, Head of the Islet Biology Lab

Growing the next generation of research leaders
Rising Star Awards are one-off grants designed to support the research costs of projects led by our young postdoctoral researchers, valued up to $40,000 for a single year. The grants are awarded through an annual competitive process, and provide a springboard for a successful career in research.

“This funding has supported me to help create an artificial intelligence algorithm to improve breast cancer diagnosis via mammogram scans.”
Dr Carlos Solorzano Pena, Postdoctoral Researcher and Rising Star Award recipient

Serving the community
Since the first Lions Club was formed in 1947, Lions Australia has grown to be Australia’s largest service club organisation, with a strong history in community service and commitment to improving the lives of others.

“The Lions commitment to funding an Incucyte machine not only will help a lot of labs at SVI, including mine, to do difficult technical research, but it is also a vote of confidence in what we do. It really helps you to keep going when you know there is so much belief in your work.”
Associate Professor Jon Oakhill, Head of the Metabolic Signalling Lab

Bright sparks awarded Scholarship support
The SVI Support Group has been raising funds for SVI since 1989 — more than half the SVI’s lifetime. Over those years, the Group has played an important role in nurturing more than 100 of SVI’s brightest young students through Top-up Scholarship support. By providing $5,000pa for the duration of a PhD project (3.5years), Scholarships relieve financial pressure on our students, enabling them to spend more time developing their research skills.

“Receiving a Top-up Scholarship means more than just financial assistance. It signifies the belief in my potential, dreams, and the value of scientific research.”
Ruqian Lyu, PhD student

“In 2005, I was one of the first recipients of an SVI Top Up Scholarship. The financial support enabled me to buy my first laptop computer, on which I learnt the power of coding in research. The skills that I gained using that computer form the basis of my research today.”
Professor David Ascher, Former SVI PhD student, now Director of the Biotechnology Program at the University of Queensland

A passion for discovery
Since 2021, SVI’s Discovery Fund has provided support that allows the Institute to pursue its highest priorities. The Discovery Fund is a perpetual endowment established by long-time supporter Christine Tarascio AM. Members of the Discovery Fund commit to providing a contribution of $50,000 over 5 years. Having achieved its initial capital goal of $5 million in 2021, the Discovery Fund distribution in 2023 was used, amongst other things, to provide support towards the work of Dr Ash Hoque, a young postdoctoral researcher focused on research into stroke.

“This support and belief in my work has inspired me to strive for excellence and make significant progress in understanding the brain damage caused by stroke, with the aim of improving the lives of stroke survivors.”
Dr Ash Hoque, Metabolic Signalling Lab

A gift for the next generation
SVI was established thanks to a bequest left by racehorse trainer Jack Holt, who died in 1951. Following in Holt’s footsteps, when former Chair of the SVI Board, Hilton Nicholas AM OBE, died in 2017, he left a generous bequest in his Will to power research at SVI. A Gift in your Will has the potential to fuel life-saving discoveries for many generations into the future.

“I am grateful for support that I received in 2017 from SVI, which allowed me to pursue my independent research path. This led to my current research program, now supported with grants from the Australian Research Council and the National Health and Medical Research Council.”
Dr Kim Loh, Head of the Diabetes & Metabolic Disease Lab
Inspired by discovery, driven by purpose.