Fighting cancer with humanity and innovative research

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Video:

Australian cancer researchers at internationally recognised Peter MacCallum Cancer Centre in Melbourne are transforming patients' lives with groundbreaking research fast-tracked direct from the lab to the patient's bedside.

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In 70 years, the Peter MacCallum Cancer Centre has grown from a modest one room operation into a world renowned cancer research, education and treatment centre, recognised for pioneering scientific breakthroughs and highly developed industry collaborations.

The Centre treats more cancer patients each year than any other Australian hospital and leads a plethora of national and international studies on the causes, diagnosis and treatment of all kinds of cancer.

It is the only Australian organisation combining hospital and medical research institute, with 600 researchers and students solely dedicated to cancer, CEO Dale Fisher says.

Hospital and research centre in one

Sharing the corridors with patients and their families gives researchers a daily reminder of the impact of their

work.

“We focus on translational research, that is, bringing research discoveries from the laboratory bench to the bedside, thereby transforming lives,” Fisher says.

“We are the largest cancer translation centre in the country. We are continually innovating and trialling new technologies, practices and methods. We have the latest thinking and ideas which can be fast-tracked to patient care under the one roof.

“Each of our 3000 staff have a designated role to play and we are bound by a shared passion and commitment to precision in order to achieve the best possible outcomes for people affected by cancer and do so with diligent care and human kindness.”

Peter Mac is training Australia’s future cancer workforce, Fisher says.

“We have 36 qualified clinicians currently undertaking PhD studies at Peter Mac. This represents more than 30 per cent of our total student cohort, and we intend to bolster these numbers even further.”

The changing face of cancer treatment

Researchers at Peter Mac have developed groundbreaking tests and treatments in different blood cancers, melanoma and skin cancer, lung cancer, oesophageal cancer, as well as breast, ovarian and uterine cancer.

Many of the new drug treatments are targeted specifically to kill cancer cells.

For decades, surgery, chemotherapy and radiotherapy have been the mainstays of cancer treatment. But, this is rapidly changing with the development of personalised drug therapies that target precise weaknesses in a cancer cell’s make-up.

In addition, new antibody and cell therapies can activate a patient’s immune system to attack tumours. For example, in CAR T therapy, patients’ own T cells are collected from their blood, and reprogrammed in the lab to create T cells that are genetically coded to hunt the patient's cancer cells.

“We believe CAR T therapy or more broadly cellular immunotherapies will change the landscape of cancer treatment,” Fisher says.

In 2018, Peter Mac intends to treat up to 50 patients with the first commercial CAR T product, Novartis Kymriah.

Further trials are planned in myeloma and solid tumours, which, if successful, could mean that several hundred patients with advanced cancer will be treated with novel cellular immunotherapies within the next five years.

In April 2018, Peter Mac announced a breakthrough drug, Venetoclax, marking a shift in the treatment of a range of blood cancers, with two new clinical trials of chemotherapy-free combinations demonstrating dramatic benefits for patients with hard-to-treat diseases.

Venetoclax is based on scientific discoveries made at Melbourne’s Walter and Eliza Hall Institute of Medical Research and collaborations with Peter Mac researchers and clinicians. The trials used Venetoclax in combination with another targeted drug, and resulted in remarkably high rates of clinical response, even in patients who had exhausted every other available treatment option.

Just a few months later, in June 2018, an immunotherapy treatment trial for incurable cutaneous squamous cell carcinoma delivered remarkable results. Almost half, or 47 per cent, of patients with this advanced form of skin cancer who had no treatment alternatives left had their cancers shrunk or completely eliminated.

“The results were so strong that processes are now underway in Europe and in the US to fast-track this treatment approach,” Fisher says.

Support network

Peter Mac has formal collaborative agreements with the MD Anderson Cancer Centre and the Dana-Farber Cancer Institute in the US, and China’s Fudan Shanghai Cancer Centre, and collaborates with other cancer centres worldwide.

Over the last two years, it has also established three global industry collaborations with pharmaceutical companies – Roche-Genentech, Bristol-Myers Squibb and Glaxo-Smith-Kline – to support lab-based and translational research in cancer immunotherapy, generating over $10 million in joint project investment.

While astrophysics may seem a long way from the cancer lab, Peter Mac researchers think otherwise. They are partnering with Swinburne University astrophysicists and computing experts to use their knowledge of space and stars to better understand cancer.

“Stephen Hawking believed that the future for humanity lies in space,” Fisher says.

“We are thrilled to be working with Swinburne University here in Melbourne to help solve our complex research problems such as flow cytometry clustering – cell counting, sorting and biomarker detection – and data mining for genomic mutations. What a wonderful and innovative extension of our powerful research collaborative network.”

The future is in clinical trials

Peter Mac has the largest number of current clinical trials in Australia, with more than 100 recruiting patients at any one time and a further 100 in follow-up phase.

However, the growth of cancer clinical trials must be accelerated over the next decade, Fisher says.

“We must invest in Australian investigator driven trials and develop Australian IP through collaborative clinical trials research – something Australia does far less well than the US or Europe.”

The looming challenges of the rising costs of health care and medical research mean Peter Mac cannot rely on government funding alone, Fisher says. “We need to partner with industry and diversify our revenue streams.“

While Peter Mac, and Australia more broadly, performs strongly in medical research, “Australia needs to transform the way it translates these findings to commercial outcomes,” Fisher says, and this is one of the organisation’s goals over the next five years.

”Digital technology, artificial intelligence, machine learning and the use of data will dramatically change the way we work. We will also need to invest in the technology infrastructure and education and training for a new

generation of skills.”

Find out more about Peter MacCallum Cancer Centre.
