UNIVERSITY OF Southampton

CURING CANCER FROM WITHIN

CANCER IMMUNOLOGY FUND

Saving lives with our groundbreaking research

Centre for Cancer Immunology

CANCER IMMUNOLOGY AT SOUTHAMPTON

In 2018, the University of Southampton opened the Centre for Cancer Immunology. Based at Southampton General Hospital, it became the UK's first centre dedicated to cancer immunology research – and it was funded entirely by philanthropy. Thanks to the incredible support of our donors, we smashed our £25m target to build the Centre, and have been able to accelerate our groundbreaking research within.

Of course, the work didn't stop once the Centre was built. Thanks to our donor community, we've continued to support cancer immunology research – funding the Centre's talented scientists, innovative ideas, and vital cutting-edge equipment. The ongoing generosity of our donors has also allowed us to fund the UK's only PhD programme in cancer immunology, right here at Southampton.

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Why support cancer immunology at Southampton?

For half a century, the University has been at the forefront of this research field. It all began when the trailblazing Tenovus Immunochemistry Research Laboratory opened at Southampton in 1971. The 50 years since have seen countless world firsts from our researchers: the first to use antibody treatments to remove leukaemia cells from the blood of patients; the first to show it's possible to enhance the cancer-killing properties of an antibody by molecular engineering; the first to develop and test a DNA cancer vaccine to encourage the immune system to recognise cancer; and many more.

These innovations in cancer immunology continue to this day at our Centre for Cancer Immunology. We're advancing the revolutionary treatment known as immunotherapy by developing more drugs and vaccines, carrying out further clinical trials with outstanding results, and making greater breakthroughs – extending and saving lives, and ultimately curing cancer. But to remain at the forefront, we need your support.

What is cancer immunology?

Simply put, immunology is a revolutionary development in the fight against cancer. It offers a less invasive treatment for patients, and the results we've been seeing over the past few years are incredible.

Our immune system is an amazing thing. It has the ability to fight all sorts of diseases, including cancer. Within us are killer T cells – these anti-cancer serial killers detect and target cancer cells, destroying them one by one, and ultimately preventing the spread of the disease.

However, sometimes we need to encourage the immune system to fight a little harder – to ensure cancer doesn't evade our natural defences and develop. When cancer cells switch off or confuse killer T cells, they can grow exponentially.

This is where immunotherapy comes in. Approaches to this treatment – being pioneered at Southampton – are supercharging our natural defences. Killer T cells are switched back on, enabling them to recognise and eliminate cancer cells.

What's more, the treatments developed at Southampton seek out and destroy hidden cancer cells in other parts of the body – not just the visible ones. And the beauty is that this immunity can potentially last a lifetime.

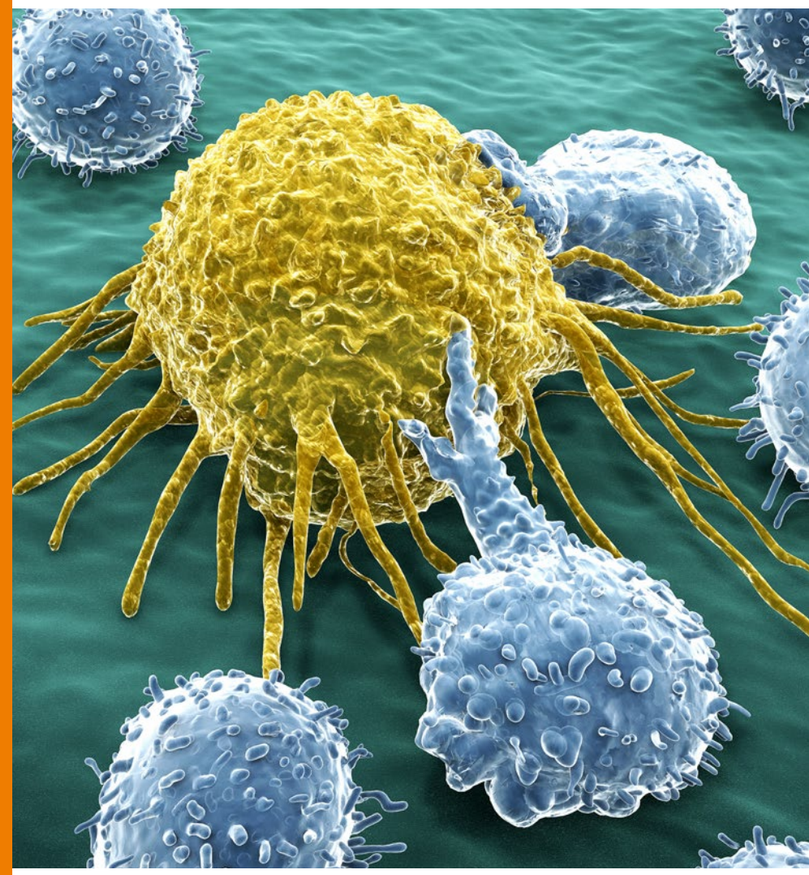
Cancer Immunology Fund

The Cancer Immunology Fund is our way of advancing the life-saving innovations happening at Southampton. Our scientists are making incredible discoveries – and have been for years – but we want to go that one step further. More scientists and more equipment are needed to make our pioneering plans a reality, and accelerate our transformative research.

You can help. By giving to the Cancer Immunology Fund, you'll be supporting the Centre and its most pressing research needs.

We created the Cancer Immunology Fund, simply, to provide a vital resource to our team for advancing their cutting-edge research. This can be though investing in the Centre's people, their ideas, or the tools that they need to make the breakthroughs. Find out more in the following pages about how these three areas are central to achieving our goal to beat cancer.

The Centre is such a dynamic environment, quickly adapting and developing new research themes and treatments. By supporting the Cancer Immunology Fund, you can enable our team to respond to their findings with speed and agility, following their discoveries to make breakthroughs that benefit people across the world.



THE PEOPLE

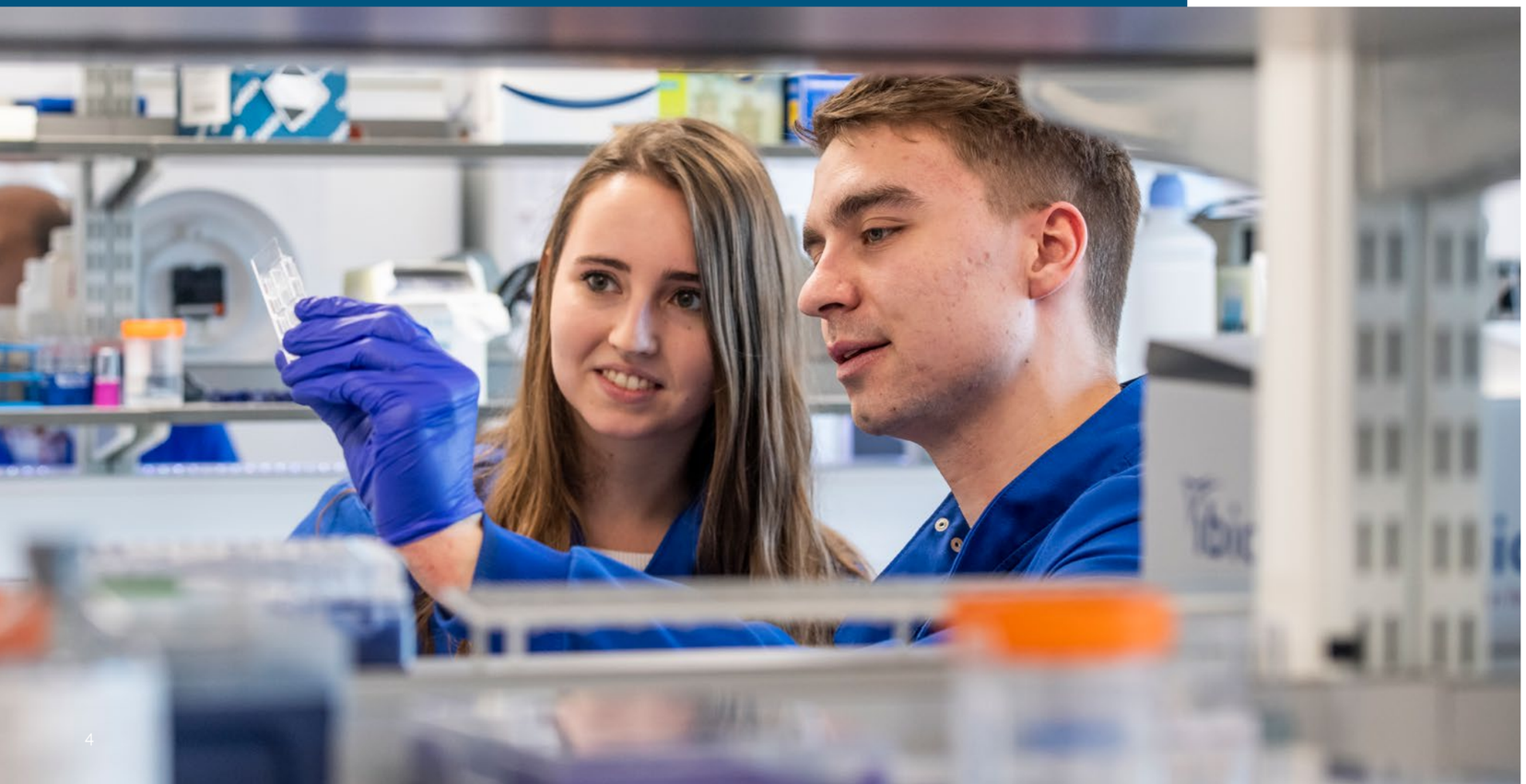
The people who work within our Centre for Cancer Immunology are the beating heart of our fight against cancer. Without the talented scientists and supporting staff, we'd be unable to progress our groundbreaking research and save lives from this terrible disease.

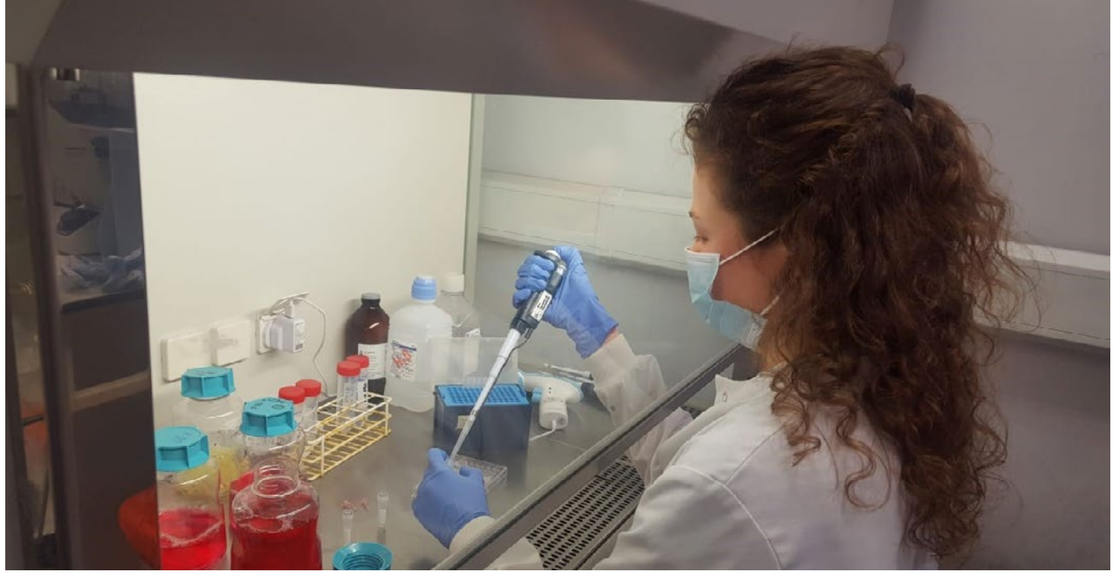
We already have some of the brightest minds in cancer immunology here in Southampton. However, your donations are needed to ensure that we can continue attracting and nurturing an exceptional team – now and for years to come.

Just one example of the support we offer the Centre's people is springboarding the work of our Early Career Researchers (ECRs). These are scientists who have completed a PhD, and are in the first five or six years of a research role – at the heart of our research programme. However, they're often entirely reliant on charitable funding – the availability of which has been significantly reduced in recent years, particularly since the COVID-19 pandemic swept the world.

To progress their research and grow their teams, our ECRs need continued funding, resources, and opportunities. These are future Principal Investigators – the pioneers of tomorrow – and we want them to stay and thrive at Southampton. By providing them a three-year fellowship at the Centre, our ECRs have the freedom to develop novel ideas and launch their research and careers.

By donating to the Cancer Immunology Fund, you'll ensure we recruit and retain the best scientists that cancer immunology has to offer – and give them and their projects as many development opportunities as possible.





Esme Fowkes, PhD student

"Cancer vaccines have massive potential to fight cancer, without the toxicity associated with current treatments such as chemotherapy, and provide improved long-term protection against recurrence."

Scientist story – Esme Fowkes

Esme Fowkes is just one of the Centre for Cancer Immunology's people whose work has been possible thanks to the continued support of our donors. We run the UK's only PhD in cancer immunology, and Esme joins around 30 other students on the programme. Her position – which looks to improve vaccines to fight cancer – is funded through a scholarship from the Cancer Immunology Fund.

Esme is currently working with Dr Natalia Savelyeva to improve the selection of antigens for personalised vaccines for patients. She's looking at strategies which could increase vaccine induced anti-tumour immunity – in particular, increasing the numbers of tissue resident memory T cells which are associated with improved outcomes for cancer patients.

Esme says: "Cancer vaccines have massive potential to fight cancer, without the toxicity associated with current treatments such as chemotherapy, and provide improved long-term protection against recurrence. This ultimately increases the survival time of cancer patients. But developing cancer vaccines is very complex as each person's cancer is somewhat unique to them. We hope this study will take a step forward in the development of this much-needed treatment method."

Esme decided to study at Southampton due to its international reputation for bench-to-bedside results in cancer research. As she explains, "I was drawn by the cutting-edge research, the state-of-the-art facilities, and the emphasis on a collaborative approach to accelerate progress. Southampton is a leading institution in cancer immunology research, and with the Centre for Cancer Immunology being the first place in the UK dedicated solely to this field, I knew I wanted to study there.

"Additionally, I felt the integrated PhD course structure offered at Southampton would give me the opportunity to explore my interests in different areas of exciting new research, and gain a variety of experiences through lab rotations in the first year – preparing me to be a better research scientist."

On the need for philanthropic donations – which provided her position – Esme says: "Funding medical research is incredibly important to expand the field and push it forward, and it is extremely humbling to know individuals are supporting me. Their generous donations are helping me to have a strong start in my dream career in cancer research. More importantly, they're training me to be able to carry out research which – in collaboration with many others in Southampton and across the world – will help to develop treatments to improve prognosis for cancer patients, and ultimately save lives."

THE IDEAS

Even the smallest of ideas can spark the most revolutionary breakthroughs in cancer research. At the Centre for Cancer Immunology, thanks to an interdisciplinary approach, our scientists work collaboratively to develop exciting research ideas that could lead to real change in cancer treatments.

However, these early concepts are often 'high risk, high reward', and require further development before more substantive funding from external sources can be secured. Donations from generous supporters like you are confronting that problem head-on.

We want to foster a culture of curiosity-driven research at the Centre – where novel ideas are encouraged. That's why our Cancer Immunology Fund supports innovation and pushes these cutting-edge projects to the next level. New, early discoveries in research like this can then influence much larger projects – ones that focus directly on creating more effective cancer treatments.

Your support of the Cancer Immunology Fund is vital in moving our scientists' ideas into reality – at an early stage – leading to results that can be life-changing.

"Although it could sometimes be more time-consuming than the standard treatment, I can't emphasise enough how worthwhile and meaningful the immunotherapy trials and research felt."

Patient story – Andy Ayres

"It started with an uncomfortable feeling in my upper stomach – a slight sickness – on and off for a couple of weeks."

Andy didn't think too much of the discomfort at the time. But when the symptoms resurfaced at the party celebrating his wedding anniversary – and gradually worsened across that Saturday – he retired to the bedroom while his wife Julia entertained the guests. A couple of hours later, Andy's daughter Stephanie checked in on him; seeing no improvement in his situation, she insisted that he go to the hospital.

At Southampton General Hospital, Andy had a blood test in the very early hours of Sunday morning, and nervously waited all night with Stephanie for the results. When the doctor eventually examined him, there was seemingly no evidence of anything sinister. He was offered two options: some medication to improve the feeling of sickness, or further examinations.

"I was happy to take the pills – I didn't want to cause any more trouble or take the doctors' time. But thankfully, Stephanie interjected and insisted on the option of progressing the matter."

By the Tuesday, Andy had an appointment with an oncologist – and despite vague symptoms, a CT scan was swiftly arranged for the following day, with a results appointment on the Thursday. A nodule had been discovered where the small intestine meets the large intestine, and an endoscopy was required to confirm its severity.

Within a few days, Andy had gone from discomfort to a likely cancer diagnosis. When it was confirmed shortly afterwards that he had non-Hodgkin lymphoma, Andy felt numb.

"I was terrified at first. And then I went through all the emotions. I remember a huge feeling of guilt – for causing so much upset and pain for my family and friends. They were shocked and devastated at the news."

Andy, Julia, and their son Dean met with Peter Johnson, Professor of Medical Oncology at the Centre for Cancer Immunology, to discuss his options. They were introduced to ACCEPT – a Phase II trial of immunotherapy drug acalabrutinib, used in conjunction with chemotherapy – which Andy was more than happy to participate in.

"I consider myself very fortunate – not only to have been diagnosed early, but also to have had this amazing immunotherapy treatment at Southampton, given by selfless people."

Over the following eight months, Andy was spending up to four days a week at the hospital. His chemotherapy was deferred on several occasions due to low blood counts, but the immunotherapy treatment offered hope.

"At many stages throughout the treatment, I kept worrying about how serious my situation was. I feel that as soon as you've had a diagnosis like this, you have to live with the fact that it may not go away forever – even if you're given the all-clear at some point. And you have to try and put that to the very back of your mind so that you can have some sort of normal existence.

"The immunotherapy treatment I received was very good indeed, and definitely favourable to the chemo. The only side effect I experienced was some slight bruising on the face – nothing more. I would not hesitate in recommending immunotherapy."

Andy was astounded; his treatment was a success. The immunotherapy put him in remission in less than a year. He continues to feel well, remains extremely grateful to all those involved, and has a whole new outlook on life.

"I consider myself very fortunate – not only to have been diagnosed early, but also to have had this amazing immunotherapy treatment at Southampton, given by selfless people. I cannot thank the incredible doctors and researchers enough – I cannot express how grateful I am in words.

"I now appreciate time with my wife, family, and friends more than ever before. I always remember one of the wonderful research nurses shortly after my diagnosis saying 'this is just a period of time', and I believe that period of time has now passed. I'm looking forward to the future, working less, and having more quality time – since none of us really know what's just around the corner."

Trials have now resulted in the immunotherapy drug being approved for use in the NHS – without the need for chemotherapy. And as just one of Southampton's many success stories, Andy understands the value of research and clinical trials into cancer immunology.

"Although it could sometimes be more time-consuming than the standard treatment, I can't emphasise enough how worthwhile and meaningful the immunotherapy trials and research felt. In some strange way, it's all quite rewarding – like you're contributing to science and helping with future treatments.

"Nothing moves forward without trials. And I wouldn't have been able to have this amazing immunotherapy treatment without others funding and undertaking trials before me. It's that simple."

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Peter Johnson, Professor of Medical Oncology

THE TOOLS

Equipment is vital to facilitate and maintain the Centre for Cancer Immunology's world-class research, and our scientists need access to the best. It doesn't just have to be state of the art, but also bespoke – tailored to our unique research requirements. All of this shortens research time dramatically, and enables deeper analysis.

What's more, as technology is constantly developing, some equipment can become superseded – or just simply needs replacing. We want to ensure the most up-to-date and powerful tools are at our scientists' disposal all the time, and your donations are essential in making that possible.

Our list of required equipment is ever evolving, and ranges from cutting-edge, high-resolution microscopes to specialised pipettes for accurate dispensing of liquids.

Your support for the Cancer Immunology Fund will provide the tools that our scientists need to remain at the very forefront of the field, and to push the boundaries of their life-saving research one step further.

"We want to ensure the most up-to-date and powerful tools are at our scientists' disposal."

Illuminating our understanding of the immune system

The Cancer Immunology Fund is already enabling our scientists to develop their innovative research ideas. One such example is 'massively parallel single-cell sequencing', as Mark Cragg, Professor of Experimental Cancer Research, explains:

"As our understanding of cancer grows, it's clear that tumours are more complex than we ever thought. Previously, cancer scientists studied how tumours work by measuring gene expression as an average of all cells within a tumour, and used this to better understand how they're generated and might respond to treatment. However, recent discoveries have shown that each cell in a tumour can display unique expression profiles and contribute to its overall behaviour. Therefore, technologies that are able to decode what each cell in the tumour is doing individually are the next step in gaining better understanding of cancer, and designing new, more effective treatments.

"So-called 'massively parallel single-cell sequencing' provides the opportunity to gain this understanding. Central to generating high-quality data in this field is a reproducible and rapid way of generating single cells. The Chromium Controller platform is a sophisticated piece of machinery that uses advanced microfluidics to perform single-cell partitioning and barcoding in a matter of minutes, therefore providing the ability to reproducibly generate tens of thousands of single cells – each containing an identifying barcode for integrated downstream analysis and assessment of their expression profile.

"Recognising this need at the Centre, we approached the Cancer Immunology Fund to provide additional pump-prime funding to purchase the Chromium Controller platform. The machine is now generating fascinating data illuminating our understanding of cancer immunology. For example, my colleague Dr Sean Lim is using it in combination with another innovative technique called CITE-Seq, which combines gene-expression analysis with cell-surface staining to understand how various antibody immunotherapies kick-start the immune system. This data will then be used in support of future, larger grant applications."

Mark Cragg, Professor of Experimental Cancer Research

Dr Sean Lim, Associate Professor and Honorary Consultant in Haematological Oncology

THOUGHTS FROM OUR GENEROUS DONORS

Over the years, we've been extremely grateful for the support of thousands – University alumni, local residents, organisations, and others – that have given to cancer immunology at Southampton. Here are just a handful of our wonderful donors, explaining in their own words the reasons behind their generous gifts.

Anne Strong

"I've been an alumna donor for many years, contributing to various funds at the University. When I learnt about the Cancer Immunology Fund, it felt right to direct my donations to this area.

"Cancer had touched my life – fortunately not myself, but close family – and I knew anything that might bring a cure or alleviate suffering would be so worthwhile getting involved with, even if it was on a very small scale.

"I was incredibly impressed with the way that my husband and I were immediately taken into what feels like 'the immunology family'. We were kept up to date with the progress of the building, and this has continued with the research developments and other news since its opening. We've also been invited to presentations at the Centre and online, which have been most informative.

"It's clear that personal donations are essential to progressing this work, and I therefore feel honoured to be able to contribute. I particularly like having a personal contact at the University who keeps me updated and who, I can honestly say, has become a friend."

Joanna and Chris Humphries

"Some time ago, Chris and I heard about the work in cancer immunology happening at Southampton – close to our home. We met with the University to find out more, and were blown away.

"We realised the Centre's work was groundbreaking and world leading. Hearing about their incredible achievements convinced us to donate and help to continue their vital work – and we chose to do this by investing in the people of the Centre.

"Having spent a career in fundraising, I know how important committed giving is: it provides organisations the ability to plan for the future with confidence, and not live a hand-to-mouth existence. We're very happy that we can support this incredible cause in a small way."

Sherman Yan

"When I first heard about the Centre, I didn't know much about cancer immunology. But I began to do some research, and learnt about the benefits of this unique treatment – including that it's often a successful last resort where other treatments have failed.

"Everyone benefits from medical science and research, and so many people will sadly face cancer. Where there's an opportunity like this to help advance the boundaries of our knowledge, I feel I have to play a small but important role in supporting it."

"We realised the Centre's work was groundbreaking and world leading. Hearing about their incredible achievements convinced us to donate and help to continue their vital work."

CANCER IMMUNOLOGY IN NUMBERS

Cancer in the UK:

1 in 2
people will be diagnosed with cancer during their lifetime

Somebody is diagnosed every
2 minutes

More than
160,000
people die of cancer every year

Cancer survival has
doubled
over the last 40 years

Centre for Cancer Immunology:

More than
20%
of patients on our trials go on to live completely cancer-free lives

14,250
square feet of lab space

Over
110
papers published in the past three years

Almost
80%
of our research grant funding comes from charities

Cancer Immunology Fund:

Over **£28m**
raised for cancer immunology at Southampton

Over **6,500**
donors from
39 different countries

Our donor community:

University alumni: **80%**
Non-alumni: **18%**
Organisations: **2%**

Largest single gift:
£10m

Sources: Centre for Cancer Immunology; Office of Development and Alumni Relations; Cancer Research UK

HOW YOU CAN HELP

Research, by its very nature, is ever evolving. By donating to the Cancer Immunology Fund, you'll be giving us the agility and flexibility to quickly support funding needs as they arise – whether that's our people, their ideas, or the tools they require. This type of 'unrestricted' gift provides our scientists with the very best opportunities to follow their discoveries, and ultimately save more lives from cancer.

Here are just a few examples of where your support could make a difference...

The people

Research Fellows are a critical part of the scientific ecosystem, responsible for advancing discoveries and translating them into benefits for patients. It costs around £250,000 to support one of these roles over a three-year period. By joining our donor community, your combined support could help to attract and retain the best people for Southampton.

The ideas

£25,000 of funding can help turn a lightbulb moment into a full research project – we never know when these innovative ideas will spark the next revolutionary treatment for cancer.

The tools

Our team needs an ever-evolving range of cutting-edge equipment to advance their work – items can cost from £200 right up to £200,000. We have a constantly changing list of the kit, and we'll use your donation for what's needed most.

Every gift is a personal choice, and our Development team would love to talk with you about how your philanthropy can make a real difference. Please contact us on the details below for a friendly conversation on supporting this important research.

- Call us on **+44 (0) 23 8059 2747**, or email us at **youreit@southampton.ac.uk**
- To donate, go online to **giving.southampton.ac.uk**
- Visit our website at **www.southampton.ac.uk/youreit**

Our promise to you

We're proud to say that, unlike many other charities, 100% of your donation goes directly towards our cancer immunology research. We greatly value your support, and promise to keep in touch with you to share news about the impact of your generosity.

Thank you for considering making a gift today. Together, we'll beat cancer – once and for all.

Find out more:
southampton.ac.uk/youreit

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