

search

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Inside this issue

12 | In profile:
Dr Olivia Rossanese – finding
new ways of attacking cancer

14 | Focus on:
Building a new Centre for
Cancer Drug Discovery

19 | Inspired by:
Christopher's Smile – ICR
honours campaigning parents

Our mission is to make
the discoveries that
defeat cancer.

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Editorial

Welcome to a very special edition of Search, which focuses on our new Centre for Cancer Drug Discovery – a state-of-the-art research building that will create innovative, specialised drugs for cancer patients.

There will be no other cancer research building like this in the world. Here we intend to make an historic step change in cancer treatment, by creating a new generation of smarter, kinder, resistance-busting cancer therapies – with the promise of making cancer a chronic manageable disease or even virtually curing it.

Before any of this can happen, we need to raise the final £14 million to complete and equip the Centre. For the next twelve months, we will be running a public campaign entitled “Let’s finish it” to support our capital appeal. You can read about our first campaign initiative on page 18.

There is more information about the new Centre on pages 14-18. And on pages 10 and 12 we introduce two researchers who will be moving to the building when it is completed.

I do hope you will enjoy reading this edition of Search and that you will continue to follow our progress as the Centre for Cancer Drug Discovery opens next year. With your help, we will all work together to give cancer patients a better future.

Lara Jukes
Director of Development
The Institute of Cancer Research

- 04 Research news
- 06 Fundraising news
- 08 Record-breaking London Marathon team
- 08 Events calendar
- 10 In profile: Dr Albert Antolin
- 12 In profile: Dr Olivia Rossanese
- 14 In focus: Our new Centre for Cancer Drug Discovery
- 16 Patient focus: How targeted drugs can make a difference to patients’ lives
- 19 Inspired by: Christopher’s Smile

Prostate cancer gene test matches patients to ‘search and destroy’ drugs

A genetic test developed by the ICR may help pick out men with prostate cancer who will benefit from a new type of targeted medicine.

An emerging class of drugs dubbed ‘search and destroy’ treatments are starting to show great promise, even in men for whom targeted treatments and chemotherapy have stopped working.

In research led by Professor Johann de Bono, a new test helped identify patients whose cancers have a genetic weakness that means they are likely to respond to these innovative targeted treatments.

Understanding how drugs can be tailored to tumours in patients with different genetic profiles will be among the range of strategies pursued by scientists at the new Centre for Cancer Drug Discovery. Exploiting the unique traits of some tumours will lead to new drugs that can be used when cancer has become resistant to other treatments.

NICE approves use of targeted cancer drug olaparib earlier in treatment for women with ovarian cancer

NICE has approved the use of targeted cancer drug olaparib earlier in the course of treatment for women with late-stage ovarian cancer and other gynaecological cancers who have BRCA gene mutations. This treatment will now be available on the NHS via the Cancer Drugs Fund for women who have responded to one round of platinum-based chemotherapy, instead of after three rounds of chemotherapy, which has been the standard of care.

Research has shown that women with ovarian cancer who have BRCA mutations benefit from taking olaparib earlier in the treatment process. The ICR is calling for wider gene testing in ovarian cancer, to ensure as many patients as possible can benefit from the drug.



Professor Nicholas Turner

New blood test predicts breast cancer’s return at start of treatment

An innovative blood test, developed at the ICR, can predict how well women with breast cancer will respond to a new drug shortly after starting treatment.

The test, developed by the ICR’s Professor Nicholas Turner and his team of researchers, is able to detect genetic changes within women’s breast cancers. It can indicate which patients are least likely to respond to the targeted drug palbociclib – and if their disease could be expected to come back quickly.

In future, the new test could help identify the women at the highest risk of seeing their breast cancer return quickly as well as those who will do very well on this treatment.



Immunotherapy could work against bowel cancers resistant to important targeted treatment

Some patients with bowel cancer who develop resistance to targeted drug treatment could benefit from immunotherapy, ICR researchers have found.

In research led by Dr Marco Gerlinger, bowel tumours which had become resistant to treatment with a drug called cetuximab became more visible to the immune system. This may make the cancer more vulnerable to immunotherapy – a treatment which harnesses a patient’s immune system to target cancer cells. Treatment resistance is the biggest cause of death in people with cancer.

This research forms part of the ICR’s ambitious strategy to understand and overcome cancer evolution and drug resistance through the world’s first ‘Darwinian’ drug discovery programme.



Did you know...?

Treatment resistance is the biggest cause of death in people with cancer.



Opera stars' encore funds life-saving cancer research

After a triumphant debut last year, our Recital for Research returned to London's Spencer House in May for an evening of exquisite opera and song.

We were delighted to have four of the UK's leading opera singers perform an exclusive recital in aid of the ICR. Soprano Mary Bevan, mezzo-soprano Christine Rice, tenor Sam Furness and bass-baritone James Ioelu, under the baton of William Vann, Director of Music at the Royal Hospital Chelsea, performed at Spencer House, London's magnificent eighteenth-century aristocratic palace.

Following the performances, Professor Udai Banerji, Professor of Molecular Cancer Pharmacology, spoke movingly about his work at the interface between early-phase clinical trials, drug discovery and translational research. His team is developing innovative new cancer drugs and finding creative ways to overcome drug resistance.

All the money raised will fund our world-leading research and we are so grateful to everyone who helped to make this event such a success.

Carols from Chelsea returns this December

Our favourite Christmas event, Carols from Chelsea, will return on 3 December to kick off the festive season in style. The uplifting service, featuring a wonderful programme of readings, traditional carols and music, will take place in Wren's chapel at the Royal Hospital Chelsea. Last year we were joined by guests including actor and author Jane Asher, actor Vincent Franklin, young Armenian singer Anush Hovhannisyan and the BBC Radio 2 Young Choristers of the Year. The event raised £100,000 to help us make the discoveries that defeat cancer. We look forward to welcoming guests again this year.

For more information, visit www.icr.ac.uk/carols.



ICR holds celebration of leukaemia research

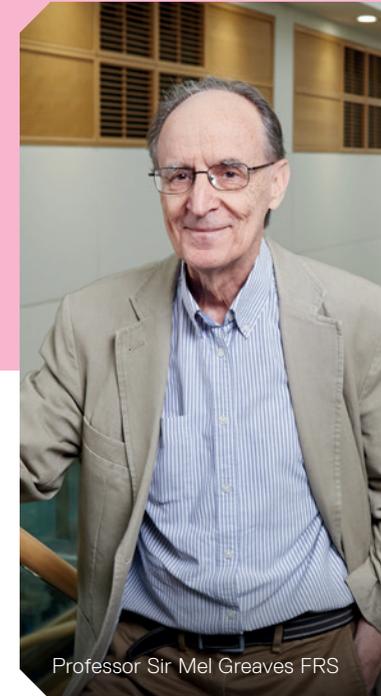
In September, a celebratory symposium at the Royal Society, the independent scientific academy of the UK, brought together distinguished leaders in the field of leukaemia research from across the world.

The event was held to celebrate the knighthood conferred on the ICR's Professor Sir Mel Greaves for services to children's leukaemia research. The symposium, entitled 'Leukaemia legacies: a celebration of the impact of blood cancer research and treatment', was a chance to share the outstanding

progress we have made through international collaboration on understanding and treating leukaemia – and to discuss the next steps in our journey to finally defeat this disease.

The event was generously supported by the Kay Kendall Leukaemia Fund, who have been donating to the ICR for many years. As keen supporters of Professor Greaves and his work on cancer evolution, the Fund has also made a substantial gift of £150,000 to the Centre for Cancer Drug Discovery – where

ICR scientists from different disciplines will come together with the joint aim of overcoming cancer evolution and drug resistance.



Professor Sir Mel Greaves FRS

Our supporters donate a record-breaking amount in 2018/19

We want to take this opportunity to thank all of our incredibly generous donors who have supported the ICR over the past year. In the financial year 2018/19, we received more than £700,000 from fundraising appeals, direct debit donations and in memory gifts – a record amount. More than 10,000 people donated to the ICR last year, an incredible milestone, and we are privileged to have such a committed community of donors.

A further £400,000 was raised by our fantastic #teamICR – 250 intrepid fundraisers who have run marathons, climbed mountains and tackled triathlons, all in the name of defeating cancer. Read more about this year's record-breaking London Marathon team on pages 8-9.

This fantastic figure was boosted by another successful spring appeal featuring Dr Gideon Coster, a new Team Leader at the ICR. Dr Coster is investigating DNA replication and how it goes wrong in cancer – you can watch our animation explaining his research at www.icr.ac.uk/DNA.

You helped us raise

£700,000

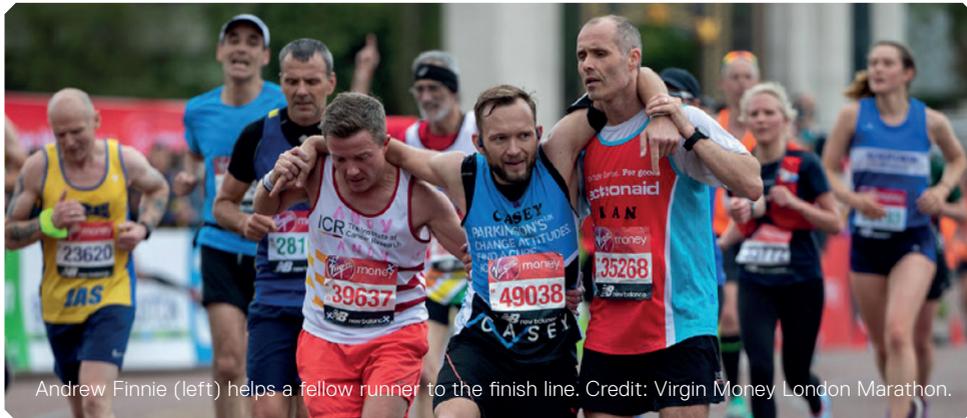
2019 is a Marathon success

This year's ICR team for the Virgin Money London Marathon proved a force to be reckoned with, raising a record-breaking £143,000 towards our internationally renowned research.

Our 36 runners – the ICR's biggest team to date – took on the marathon task of training and fundraising to take their place at the iconic start line in Greenwich Park. #teamICR's fastest runner was Michael Evans at a time of 03:13:29, followed by Andrew Finnie at 03:31:22.

The London Marathon is the world's single biggest charity fundraising event and sees marathon first-timers running alongside Olympic medal winners, such as Sir Mo Farah. In 2019 the London Marathon hit an incredible milestone, raising £1bn for charities since its first event in 1981.

Congratulations and thank you #teamICR!



Andrew Finnie (left) helps a fellow runner to the finish line. Credit: Virgin Money London Marathon.

Events calendar

🏃 March

London Landmarks Half Marathon
Sunday 29 March 2020

Starting on Pall Mall and finishing on Downing Street, London's newest half marathon is not your average race. Take in the city's quirky sights and hidden secrets as you run 13.1 miles to help us defeat cancer. Secure your place today via www.icr.ac.uk/llhm

🧗 May

Great Wall of China Trek
9-17 May 2020

Hike for five days along the magnificent Great Wall for the ICR. Take in views as this challenge takes you over watch towers and mountains, through historic battlement stations and up the 1,000 steps to the wall of Mutianyu – culminating with the ascent of the 'Heavenly Ladder'. Take on this challenge for #teamICR by visiting www.icr.ac.uk/china.

🚲 August

Prudential RideLondon-Surrey 100
Sunday 16 August 2020

Take part in the world's greatest festival of cycling for #teamICR! Starting at the Olympic Park, Stratford, race through traffic-free London, cycle out to conquer the famous Box and Leith hills in Surrey, and then celebrate your 100-mile feat with a finish on The Mall, Westminster – apply by visiting www.icr.ac.uk/ridelondon

Amy Elvidge

Total raised: £29,302

In September 2018, 20-year old Amy Elvidge set herself a birthday challenge – to raise £21,000 for the ICR by the time she turned 21 the following year.

Amy was inspired to run this year's London Marathon with her father Mark, after he was successfully treated for cancer. The father-daughter team crossed the finish line together in a time of 05:35:11.

Amy said: "It was truly an incredible day and a highlight of a lifetime! What an experience to be able to run the best marathon in the world alongside my dad. I enjoyed every single second and if my body let me, I'd run it all over again!"

You may have read about Amy's previous fundraising challenges in the spring 2019 issue of Search. We are delighted to announce that Amy has surpassed her initial target and has raised more than £29,000 for the ICR.



Andrew Finnie

Total raised: £15,378

Andrew chose to run the London Marathon in aid of the ICR because his wife, Roz, was undergoing treatment for cancer and had been part of the ICR's Generations Study, which is looking into the causes of breast cancer. Tragically, Roz died before the Marathon, but Andrew was determined to run in her memory. Andrew was #teamICR's third highest fundraiser and second fastest runner, despite generously stopping to help an exhausted fellow runner to cross the finish line.

Andrew has previously run four other marathons and he plans to continue his fundraising for the ICR by taking part in the Berlin Marathon in September 2020.



Jason Mitchell

Total raised: £16,081

Jason was driven to run the London Marathon after both his parents were affected by cancer. Jason's mum died from breast cancer in 2013. His father was diagnosed with stage four oesophageal cancer in 2017. Despite being told he only had weeks to live, successful treatment meant he survived long enough to see Jason get engaged and the birth of his second grandchild. Sadly, Jason's dad died in February 2019. Jason ran the London Marathon in 04:42:42.

"The whole experience, from signing up and training, to fundraising and race day itself, has just been incredible. I feel honoured to have been part of #teamICR."



Feeling inspired to join #teamICR in 2020?

We have lots of spaces in a variety of runs, from 10ks to full-length marathons.

Visit www.icr.ac.uk/sports to find out more and sign up.

Got a London Marathon ballot place?

If you're one of the lucky 45,000 this October to be told you have a place on the iconic London Marathon start line, consider joining #teamICR and using your place to help us defeat cancer. Email sports@icr.ac.uk to join the team.

#teamICR

Dr Albert Antolin

Dr Albert Antolin is a Sir Henry Wellcome Postdoctoral Fellow at the ICR who specialises in the new field of data science within the Division of Cancer Therapeutics. His research is using computational models to understand why patients respond in different ways to different drugs, helping to target existing treatments to those who will get the most benefit.

Joined the ICR

January 2015

Specialist subject

Using computer models of drugs and pharmacology systems

Interests

Football, spending time with friends and family, cinema, travelling

“ ”

The ICR is located next door to our hospital partner The Royal Marsden and I often see patients around the site. This gives me a very real sense that I'm not studying something purely academic. Even if we could make a very small contribution, it would have an impact on the lives of these patients. This is a very strong driver for my research.

Dr Antolin is excited about moving in to the new Centre for Cancer Drug Discovery which will accommodate more than 270 scientists and students. The building will bring together drug discovery teams and evolutionary scientists, so that they can work together on the key challenges of cancer evolution and drug resistance.

Bringing computer modelling from desk to bedside, Dr Antolin's research aims to look at the factors that help some patients respond well to certain cancer drugs, in the hope that we can use this information to treat patients who don't respond so positively.

He uses computational models to uncover exactly how drugs work at the molecular level, which helps scientists understand how they can be used to better help patients. He participates in the

canSAR knowledgebase, a global database of cancer information developed at the ICR and used by scientists all over the world.

Working with scientists from lots of other disciplines in the new Centre for Cancer Drug Discovery, Dr Antolin's research offers the prospect of creating new, tailored treatments and making use of existing drugs for safer and more effective cancer therapies.



Dr Olivia Rossanese

As Head of Biology in the ICR's new Centre for Cancer Drug Discovery, Dr Olivia Rossanese will be working to find new ways of attacking cancer as part of a drug discovery programme that is wholly focused on meeting the twin challenges of cancer evolution and drug resistance. She leads the Target Evaluation and Molecular Therapeutics Team at the ICR.

Joined the ICR

June 2015

Specialist subject

Exploiting cancer's weaknesses to discover new drugs and therapies for cancer

Interests

Country walking, trail running, all kinds of live music, cross stitching

“ ”

There will be no other cancer research centre in the world on a par with the Centre for Cancer Drug Discovery – we will have computational biologists, geneticists, evolutionary scientists and drug discovery researchers all working hand in hand.

Dr Rossanese is a classical cell biologist. She began her research career at the University of Chicago, where she obtained her PhD, followed by a postdoctoral fellowship at Yale University. She also has a background in industrial preclinical drug discovery, previously working at the Oncology Biology group at GlaxoSmithKline in Philadelphia. She was a member of the discovery team for the innovative cancer drug dabrafenib, used in melanoma treatment.

Her early research examined how cells find ways to move components such as chromosomes around inside the cell, and how dividing cells make sure that their offspring end up with all of the right components when under stress.

At the ICR, Dr Rossanese's research looks deeper at how cells manage to keep everything in balance when they are under pressure, and homes in on the molecular and genetic factors that lead to uncontrolled cell growth and the development of tumours.

These genetic and molecular changes are what allow cancer cells to continue to flourish and survive even when placed under stress through treatment.

Understanding how different molecular and genetic factors can help cancer develop, evolve and spread throughout the body allows Dr Rossanese's team to build a picture of what aspects of the cancer are best to target in the clinic, spotting weaknesses that can be exploited by new drugs and therapies.

Her team is also working to define the different factors that govern a cancer's sensitivity to treatment with new drugs, to guide their clinical use.

The unique set-up of the Centre for Cancer Drug Discovery, combining the expertise of researchers from a wide range of disciplines, will help fast track our understanding of how cancer evades treatments, so we can find new therapeutic approaches that put us one step ahead.



Our pioneering new Centre for Cancer Drug Discovery aims to deliver step changes in cancer treatment



Earlier this year, the ICR announced plans to launch the world's first 'Darwinian' drug discovery programme specially designed to tackle cancer's lethal ability to evolve resistance to treatment.

Cancer's ability to constantly adapt, evolve and develop drug resistance is what makes it so lethal – causing the vast majority of cancer deaths.

We are building a new £75 million state-of-the-art Centre for Cancer Drug Discovery, which when completed will be a global centre of expertise in anti-evolution therapies – holding the promise of outsmarting cancer to improve cure rates.

We still need to raise £14m to finish the building and equip it with the latest cancer-research technology. Only then can we bring together drug discovery scientists and cancer evolution experts under one roof to create a new generation of cancer treatments.

Our researchers will aim to harness evolutionary science to 'herd' cancers with anti-evolution drugs and combination treatments, to help deliver long-term control and effective cures, just as comparable approaches have with HIV.

Dr Olivia Rossanese will be Head of Biology at the new Centre, and is really excited about the unique

environment it will provide for research: "More and more cancer patients are living longer and with far fewer side effects thanks to new targeted cancer treatments" she said. "But unfortunately, we're also seeing that cancer can become resistant very quickly to new drugs – and this is the greatest challenge we face.

"Within the Centre for Cancer Drug Discovery, we plan to deliver a drug discovery programme that is wholly focused on meeting the challenge of cancer evolution and drug resistance through completely new ways of attacking the disease."

Professor Andrea Sottoriva, Professor of Evolutionary Genomics and Modelling, echoed this excitement, saying: "Artificial intelligence and mathematical predictive methods have huge potential to predict what a particular cancer is going to do next and how it will respond to new treatments.

"Within our new Centre for Cancer Drug Discovery, we plan to use cancer's survival instinct against it, using an approach we call 'evolutionary herding'. By encouraging cancer to evolve resistance to a treatment of our choice, we can cause it to develop weaknesses against other drugs – and hopefully send it down an evolutionary dead end to its own destruction."

“ ”

The Centre for Cancer Drug Discovery will provide us with the optimum environment for creative collaboration between scientific disciplines so that we can accelerate our work to identify novel ways to treat cancer.

Dr Olivia Rossanese

Read all about our new Centre for Cancer Drug Discovery at icr.ac.uk/drugdiscovery

The new Centre for Cancer Drug Discovery will...

Provide total space of
7,300m²
across four floors

Have a dedicated collaboration space for cross-team working

Accommodate approximately
270
scientists and students

Contain
37
discovery research units

How targeted drugs can make a difference to patients' lives

The ICR's new Centre for Cancer Drug Discovery will help create the next generation of targeted drugs and immunotherapies. We spoke to Neil Venton, from Suffolk, who was diagnosed with acute lymphoblastic leukaemia when he was 32. He received a targeted drug, rituximab, in combination with chemotherapy.

"As the name suggests, acute lymphoblastic leukaemia progresses very rapidly and aggressively. That was certainly true in my case. I was 32 years' old, had been married to my wife, Kate, for five years, and we had two wonderful boys, Caleb and Rory.

"I'd started to feel unusually tired. I also started drinking a lot more water – up to seven litres a day – which was very unusual, and began losing a lot of weight very quickly. It all just happened very fast and I knew something wasn't right.

"My GP was fantastic and arranged blood tests immediately, which were sent to the hospital. On Kate's birthday, I received a call from the hospital saying I had to come in as soon as possible, which was very scary. I was admitted the next day and they found I had a series of very serious infections.

"Even at this stage, I didn't suspect it was cancer. I used to think of cancer as something that affects

older people or children. When the doctor said he wanted me to have a biopsy and thought I may have leukaemia, I did something I rarely do. I cried. I was just so scared.

"My consultant put me on rituximab, alongside standard chemotherapy. Rituximab is a monoclonal antibody but is more commonly known as a targeted therapy.

"As a result of the treatment, I'm now in remission. I'm on maintenance therapy until August 2020. Then I expect everything to be alright.

"During the first stage of cancer, we used to plan one day at a time. There were a lot of difficult conversations. Thanks to the treatment, we're now looking much further into the future. Having that hope is really important. I've just accepted a new job, which is a sign of how much life is getting back to normal.

"I'm delighted the ICR is creating the new Centre for Cancer Drug Discovery. I have benefited from the legacy that has been passed down from the previous generation of researchers. We can leave an amazing legacy for the next generation by supporting the work of the ICR. Having a ground-breaking centre looking further into the detail of cancer is going to benefit everyone."



Neil Venton with his family

“““

During the first stage of cancer, we used to plan one day at a time. There were a lot of difficult conversations. Thanks to the treatment, we're now looking much further into the future. Having that hope is really important.

How cancer becomes resistant to treatment

1. Modern cancer treatments can help shrink and treat tumours.



2. But some cancer cells resist these treatments.



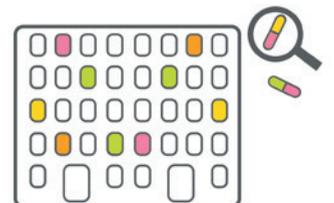
3. Resistant cells continue to grow, unaffected by cancer drugs.



4. Eventually, there are more and more resistant cells, making these cancers very hard to treat.



5. At the ICR's new Centre for Cancer Drug Discovery, we will research ways to overcome resistant cancers, and find new and better treatments to defeat them.



Let's finish it

This summer, the ICR teamed up with the Royal Philharmonic Orchestra (RPO) to create a beautiful new piece of music with a twist – it has been left deliberately unfinished.

Entitled 'Let's Finish It', the unfinished symphony abruptly cuts to silence three-quarters of the way through – symbolising the unfinished state of the ICR's Centre for Cancer Drug Discovery and beautifully highlighting the importance of raising the final £14 million, so we can get to work on finishing cancer.

The ICR commissioned Callum Morton-Huseyin, a 25-year-old emerging contemporary classical composer, to create the original anthem and for Britain's national orchestra, the RPO, to perform it.

The piece is inspired by the incomplete building itself, the efforts of researchers to outsmart cancer's evolution and their currently unfinished business in defeating the disease.

The music will remain in an unfinished state until we have raised the final funds needed to finish and equip the new building. At this point, the finished piece will be released, and it will become the official anthem for the completed Centre for Cancer Drug Discovery.

Listen now at www.icr.ac.uk/unfinished



Unfinished Symphony

ICR honours campaigning parents

In July, the ICR conferred an honorary degree on the founders of Christopher's Smile, a children's cancer charity.

Kevin and Karen Capel were honoured for their tireless work and dedication in setting up Christopher's Smile in 2008, just a few months after the loss of their five-year old son to medulloblastoma. This is a form of cancer that accounts for around one in five of all childhood brain tumours. Kevin's and Karen's incredible efforts in Christopher's memory have been improving the outlook for children with cancer ever since.

Kevin and Karen have raised more than £1 million for childhood cancer research at the ICR, providing funding for four dedicated research scientists. Their support has led to the development of a new genetic test for children with cancer – helping clinicians to choose the best possible treatments for each child.

Kevin and Karen have also been relentless in campaigning for children to have better access to cancer drugs. Their influence has been felt widely among the pharmaceutical industry, and by bodies such as the European Medicines Agency and the European Commission.

Professor Louis Chesler, Professor of Paediatric Solid Tumour Therapeutics at the ICR and Consultant in Paediatric Oncology at The Royal Marsden, said: "I have known and worked with Kevin and Karen since the inception of their charity, Christopher's Smile, more than 10 years ago. Their determination to turn the tragic loss of their son Christopher into something positive for future parents faced with similar news is truly inspirational."



Karen and Kevin Capel

“““

We feel humbled and grateful to the ICR for the recognition of our efforts through Christopher's Smile over the past 10 and a half years.

September was Childhood Cancer Awareness Month and we have been celebrating the incredible difference our family partners have made to our research in this area. To find out more, go to www.icr.ac.uk/CCAM.

