Annual **Review** — 2017

leuka

leading leukaemia research

Nurturing new ideas in cancer research

In September this year we were delighted to host a gathering of all the researchers, doctors and others who are benefiting from Leuka support, to hear about their ideas, achievements and progress; everyone there inspired by the goal of saving patients' lives.

Listening to the renowned expert, Brian Druker, who joined our celebration, I was struck by how important the nurturing of new ideas is to cancer research.

As a young researcher Dr Druker discovered one of the first ever biological treatments for cancer - the revolutionary Chronic Myeloid Leukaemia drug Gleevec - and he talked about the invaluable support he had received from Leuka's late founder Professor John Goldman, at a time when no one else would listen.

Leuka nurtures talent and gives top-class researchers and clinical professionals the opportunity to bring their ideas to life. Sometimes it can be difficult to see the link between a patient in hospital and a researcher in their lab; research is a lengthy and costly process, not always visible to the general public. But this year our work is continuing to prepare the ground for the real, tangible results of the future.

> "Leuka nurtures talent and gives top-class researchers and clinical professionals the opportunity to bring their ideas to life.

Our new 2017 Project Grants are supporting researchers at UCL Great Ormond Street Institute of Child Health: work that will hopefully lead to a vastly improved treatment for children with acute leukaemia. This year also saw the launch of the £4 million clinical trials programme IMPACT – of which Leuka contributed £1 million – helping stem cell transplant patients get better access to clinical trials for new drugs across the UK.

And all of this we could not have done without you. Alongside us you have run and climbed, baked and fundraised, and enabled our work to continue. Without your support it would not be possible to bring hope to leukaemia and blood cancer patients up and down the country, who are in need of researchers to develop new and better treatments.

Thank you for joining us this year on this journey to beat leukaemia. It will be no mean feat, but together we can achieve it.

Olive Boles
Chief Executive

Chairman's message

Twenty seven people are diagnosed with Leukaemia every day in the UK. Having once sat in the doctor's office myself and discovered I was one of those 27, I understand how imperative it is to support translational research like Leuka's.

'Translational research' is something you'll hear a great deal of in this review. It's at the heart of Leuka's work, and it boils down to this: it is the ability to translate scientific knowledge into practical outcomes for patients. Here at Leuka we are dedicated to supporting research that will bring those scientific advances to patients, and help them live better, longer lives.

It can be seen in the work of Maria Teresa Esposito, a John Goldman Fellow who you will meet in these pages. The work she and her team are undertaking at Roehampton University aims to find better treatments for Mixed Lineage Leukaemia: a rarer form that primarily affects children and currently has a poor prognosis.

As we move into 2018, it is great to take a moment to look back on the year and consider all that we've achieved with your help. We hope you'll enjoy reading about these fantastic researchers, clinicians and fundraisers who are dedicated to better understanding these blood cancers and, together, finding ways to beat them.

Chris Corbin, OBE
Chairman

> "It is great to take a moment to look back on the year and consider all that we've achieved with your help.

Funding research to save lives

Leukaemia facts and figures*

Leukaemia is a type of blood cancer that affects your blood cells, usually white blood cells. These are an important part of your immune system that fights infection. Leuka funds research into leukaemia and related disorders, including other blood cancers.

Blood Cancer is the **5th** most common type of cancer in the UK.

27 new patients are diagnosed with leukaemia every day in the UK - more than one every hour.

More than **12 people** die every day from leukaemia and just **52%** of leukaemia patients will reach five years after diagnosis.

Leukaemia is the most common type of cancer in children (**33%** of all cancers in the under **14s**) but is most common in people over the age of **55**.

Leuka - turning research into treatment

- Raised nearly **£1 million for vital research** in 2017
- Awarded **£2.2 million** to blood cancer specialist researchers in 2017
- Granted funding to **18** different research centres throughout the UK since 2015
- Funded **21** exceptional new researchers this year
- And in 2017 we awarded **£1 million** to a clinical trials network

*Cancer Research UK, http://www.cancerresearchuk.org/health-professional/cancer-statistics/statistics-by-cancer-type/leukaemia, accessed February 2018

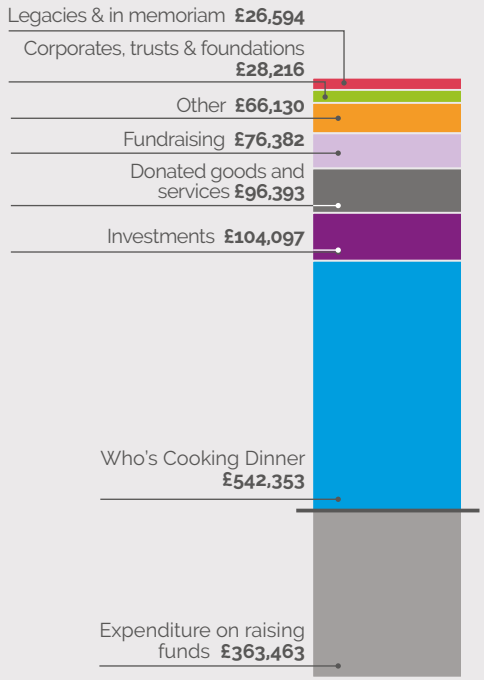
2017 financials at a glance

Spending on charitable activities 2017

Total: **£1,440,355**

Income 2017

Total: **£940,165**



In 2017 Leuka continued to build on research activities through a planned programme of drawing down accumulated reserves. For full set of Audited Report and Accounts 2017 visit **www.leuka.org.uk** or **www.gov.uk/government/organisations/charity-commission**

Meet some of Leuka's leading researchers

Dr Maria Teresa Esposito

Dr Lisa Hopcroft

Now in its third year, the John Goldman Fellowship programme has supported another four outstanding researchers destined to become the scientific leaders of tomorrow.

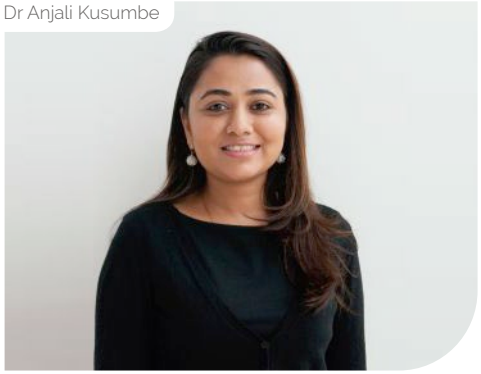
This important award provides a stepping stone for researchers to become independent, enabling them to turn their ideas and theories into tangible cancer research and to make significant contributions to understanding and treating blood cancers.

This year we awarded four talented female researchers over £490,000 to fund their work: Dr Lisa Hopcroft at the University of Glasgow; Dr Cristina Pina at the University of Cambridge; Dr Maria Teresa Esposito at the University of Roehampton; and Dr Anjali Kusumbe at the University of Oxford.

The projects undertaken by Dr Hopcroft and Dr Kusumbe will delve deeper into the roles played by the bone marrow microenvironments within which two specific leukaemias – Chronic Myeloid Leukaemia and Acute Myeloid Leukaemia respectively – develop, enabling them to search for new therapies and treatments.

Dr Cristina Pina

Dr Anjali Kusumbe



Dr Pina will focus on Acute Myeloid Leukaemia, which has a five-year survival rate of just 30%. Her investigation aims to identify weaknesses in leukaemia cell metabolism that could lead to potential treatments for AML.

Meanwhile, Dr Esposito is researching the development of a rare leukaemia named Mixed Lineage Leukaemia (MLL) that commonly affects children. She and her team will be aiming to discover how MLL stem cells develop resistance to current treatments and how that can be overcome. You can read more about Dr Esposito's research on page 9.

Alternatively, head to our website to read more about our John Goldman Fellowships for Future Science programme: **www.leuka.org.uk/JGFellows2017**

> "Turning ideas into new treatments for cancer

Funding innovation and collaboration

Professor Jackie Boultwood & Dr Andrea Pellagatti, University of Oxford.

Promising projects awarded nearly £500,000

Leading researchers at UCL Great Ormond Street Institute of Child Health and at the University of Oxford have each received an innovative new Project Grant funded by Leuka in 2017.

Dr Jasper de Boer and Dr Owen Williams at UCL Great Ormond Street Institute of Child Health have been funded to undertake a study that could create a vital new treatment for acute leukaemia in infants and adult leukaemia that has been caused by previous cancer treatment. If successful, the study supported by Leuka could lead to life-changing clinical trials.

Professor Jackie Boultwood and Dr Andrea Pellagatti at the University of Oxford will be delving deeper into the study of Chronic Myelomonocytic Leukaemia, which currently has a poor prognosis.

Leuka Chief Executive Olive Boles said, "We are incredibly excited by these important investigations. With 27 people diagnosed with leukaemia each day, it is imperative that we support research that can be translated into clinical trials and treatments. Both of these projects have the potential to do just that, to help improve the lives of leukaemia and blood cancer patients around the UK."

Chetasi Talati, MD, Florida USA

Advancing science worldwide

In the spirit of advancing scientific collaboration, in 2017 we created an International Scholarship Fund in cooperation with the European School of Haematology (ESH). It provided 10 junior doctors and scientists with the funding to enable them to attend 2017's Annual John Goldman Chronic Myeloid Leukaemia (CML) conference in Estoril, Portugal.

Leuka scholars hailed from across the globe - from Scotland to Brazil, from India to Italy. At the conference they received their awards from Professor Nick Cross, Chair of Leuka's Scientific Panel.

Chetasi Talati, MD. Hematology & Oncology Fellow, from Tampa, USA said "I thank Leuka for providing me the opportunity to be surrounded by such inspirational people. The conference was an opportunity to exchange ideas and support each other: the common goal is to advance the cure and prevent progression of the disease, which can only be achieved when everyone is united and collaborates. Without Leuka I would not have been able to attend nor have the opportunity to present my research to the worldwide CML research community."

The Leuka International Scholars were: Lorna Jackson (Scotland), Mansi Manij Shah (USA), Marin M. Machnicki (Poland), Vanessa L. Porter (Canada), Chetasi Talati (USA), Flavia Vasconcelos (Brazil), Francesco Autore (Italy), Aditya Singh (India), Tanmoy Kumar Mandal (India), Co Nguyen Phuong Dung (Vietnam).

Making an IMPACT

2017 saw Leuka join forces to launch IMPACT, a £4 million clinical trials network to improve patient survival.

The IMPACT initiative is focused on improving stem cell transplant outcomes for patients through a clinical trials network. It's ambitious, the first of its kind in the UK, and will encompass four years, 12 clinical trials and approximately 1,500 patients.

Advances in stem cell transplantations mean almost every patient can now find a suitable donor, but the survival rates following a transplant are sadly lagging. Over 50% of adult transplant patients do not reach the five year survival mark following their transplant, which is why we donated £1 million to help fund this much-needed research.

Here to tell you more about this important advancement for blood cancer patients, is the Medical Director of IMPACT, Professor David Marks:

Professor Marks, could you tell our supporters a little bit about you and your role in IMPACT?

Certainly: I am the senior transplanter at the Bristol Bone Marrow Transplant Unit. I've worked in Bristol for 21 years and have a particular interest in bone marrow transplantation and acute lymphoblastic leukaemia. I was appointed in 2016 as Medical Director of IMPACT and I am here to help propose and review the trials, help set them up and then make certain they run safely. The trials need to be feasible: they need to have realistic end points, and most importantly, have the goals of improving outcomes for patients being transplanted for haematological conditions.

IMPACT's research is much-needed. Can you explain how it will help leukaemia and blood cancer patients in the future?

The vast majority of IMPACT's trials will be transplant trials for leukaemia or other blood cancers. Previously, only about 5% of patients transplanted have been entered on a clinical trial and therefore have not had access to these new therapies or new ways of doing transplants.

Indeed, the goal of IMPACT is to at least double that number of patients on transplant trials and there will be 22 centres with an IMPACT nurse, whose job will be to identify the patients, explain the trial to them and support them. All of these trials aim to improve outcomes but also they will improve our understanding of how these cancers work, how transplants cure patients and why transplants sometimes fail. And if we can understand why they fail, then we can improve them for future patients.

IMPACT is looking to run 12 trials in total, and around 3 are currently underway. Could you tell us a little about them?

Yes, certainly. The first trial that is up and running is at King's College London, and is called Pro DLI. DLI stands for Donor Lymphocyte Infusion. This is a trial for patients with Acute Myeloid Leukaemia (AML) who have had reduced intensity transplants and it aims to see whether giving further white cells from the donor can reduce the chance of the leukaemia coming back and improve the patient's survival.

Professor David Marks and Research Nurses

The second trial is called ALL-RIC, a trial which I am heading. This is for patients with Acute Lymphoblastic Leukaemia (ALL). Most of these patients will be over the age of 40 and in our last major ALL trial, called UKALL14, we found that these patients did very well with reduced intensity transplants and this improved their outcomes compared to chemotherapy. However, there was a significant chance of the leukaemia coming back. Before a transplant for ALL people receive chemotherapy, and in this trial we are seeing if changing this chemotherapy to a low-dose total body radiation and a drug named Campath can improve outcomes and reduce relapse without increasing toxicity in the body.

The final trial, COSI, focuses on transplants in older patients with high risk Acute Myeloid Leukaemia (AML). This trial will look at improving chemotherapy treatment for AML transplant patients, and it will study the effects of a new drug called CPX on transplant outcomes.

They sound like very exciting trials. 2018 will definitely be a busy year for IMPACT. What will be the key things for the programme to achieve in the upcoming year?

By the end of the year we should have all three trials up and running and recruiting patients: IMPACT is aiming to accelerate the process of accessing clinical trials for patients. Alongside running the current trials, we also need to select the next three trials for the second year of IMPACT.

How would a patient go about accessing the clinical trials?

When a patient is approaching a transplant they can look at the IMPACT website **(www.impactpartnership.org.uk)** and see if there is a trial in their disease area. There will be some information on the website about these trials and the goals of these trials. It is entirely open to patients to ask their consultants, and ask if they think they would be suitable and whether the one is available to them.

Grant goes to child health

Dr Jasper de Boer & Dr Owen Williams, UCL Great Ormond Street Institute of Child Health

This year we funded established scientists and clinicians with a proven track record whose research has the potential for high impact results. We caught up with Dr Jasper de Boer to find out more about his exciting work.

Dr Jasper de Boer, can you explain for our supporters what your research focuses on?

Acute leukaemia in infants and about 10% of adults is caused by an alteration that creates a new mutated protein; called MLL-fusion protein. New treatments are urgently needed for these patients as this mutation is associated with very poor outcomes. The fusion protein is an ideal target for treatment as deactivating the protein blocks the progression of leukaemia in the patient.

However, in most cases we are unable to do so because the MLL fusion protein is currently "undruggable," – we simply can't target effectively with the treatments we currently have available.

In my laboratory we are focused on developing treatments that target the MLL fusion oncoproteins. We have developed a screening platform that will identify drugs with the ability to induce the breakdown and destroy the MLL fusion protein: it is an incredibly exciting breakthrough, and could be a game changer in the treatment of this disease.

How do you think your research will affect or impact leukaemia patients in the future?

Similar treatments for other leukaemias have been discovered that have had a dramatic result in treating that cancer. For example, Promyelocytic Leukaemia (APL), which relies on the PML/RARA fusion protein to grow and thrive, used to have a very poor outlook for patients. But now up to 90% of APL patients are cured because researchers have found a way to directly inactivate this PML-RARA oncoprotein.

Our previous studies have shown that targeting MLL-fusions resulted in the leukaemic cells being unable to self-renew and spread, leading to the remission of the disease. Given the strong evidence that inactivating these fusion proteins can give long term survival in patients suffering from acute leukaemia, it led us to investigate if this approach could be extended to inactivation of the MLL fusion proteins through specific drugs.

What inspired you to research this particular aspect of leukaemia?

This specific leukaemia (Mixed Lineage Leukaemia, or MLL) currently has a very poor clinical outcome for patients and it's clear that new treatments and therapeutic approaches are desperately needed. This award from Leuka will help us to generate the data needed to translate this drug discovery from the lab into a clinical trial with patients.

What inspired you to apply for a Leuka grant?

Leuka is a charity that is focused on translating science into real patient benefits. This is something we are trying to achieve within this project: what really keeps us motivated are the patients. We work very hard to discover new treatments with better outcomes for them and we focus on both improving the effectiveness of the treatments (to cure more patients) and reducing the side effects of the treatments (to give a better quality of life after leukaemia treatment).

Any final words for our supporters?

A sincere 'thank you'! We visualise that by the end of this grant we will be ready to initiate a clinical trial that would help the patients with this horrible disease and we would like you to know about our work and that we appreciate your support that helps us to keep going. Everybody who donates makes a really big contribution, and with your help we can get a new drug into the clinic that gives hope to people who don't have any.

> "What really keeps us motivated are the patients. We work very hard to discover new treatments with better outcomes for them

#TeamLeuka: running for research!

Charlotte Hodgson ran the Norwich 10k to raise money and inspire others to support Leuka.

In 2003, when Charlotte's sister Olivia was just 16 years old, she was diagnosed with Chronic Myeloid Leukaemia. Contracting CML at sixteen is rare – it is more common in the elderly – but Olivia was lucky. A stem cell donor match was found for her and, a year after being diagnosed, Olivia underwent radiotherapy and a transplant.

Happily, after more than a decade, the donor stem cells are working brilliantly and today Olivia is classified as having negative levels of leukaemia in her system.

When Charlotte and her friend Abi Burrell decided to run the Norwich 10k for Leuka in August, it was their hope that after hearing Olivia's story they would be able to inspire their supporters to give generously.

"I've seen my poor sister unbelievably sick," Charlotte said, "during her transplant, fighting Graft vs Host disease, and suffering daily side effects like exhaustion and an upset stomach. She is a fighter, so strong and so brave. I'm grateful every day that she is with us. Without the staff and researchers at Leuka and the Hammersmith Hospital Olivia wouldn't be here today."

Buoyed by her running success, Charlotte said, "I'm hoping to build on this and keep on fundraising. Family and loved ones are so important – you don't know what you've got until it's gone and I'm truly grateful to Leuka for helping keep my beautiful, strong, brave, courageous sister alive. Olivia's motto is "staying alive – feeling alive" and I want to do whatever I can to raise money and awareness for your vital leukaemia research, to prevent more families from having to go through the pain and suffering inflicted by leukaemia."

Charlotte raised a fantastic £577 for Leuka, which helps fund work like the IMPACT clinical trials network – the first large-scale programme of its kind in the UK aiming to improve outcomes for stem cell transplant patients like Olivia.

If you're inspired by Charlotte and Olivia, contact Simona on **simona.abis@leuka.org.uk**, call the Leuka office on 020 7299 0722 or visit **www.leuka.org.uk/get-involved** to find out what fundraising events you can participate in 2018!

Ranjeev raises £2,500 climbing Mt Kilimanjaro

In September 2017 Ranjeev Walia pushed himself to the limit climbing Mount Kilimanjaro in memory of his brother, who he lost to leukaemia in 2008.

Ranjeev decided to undertake the challenge, something they had both wanted to do and talked about doing together: "Climbing Kilimanjaro together was a dream we both had if he had survived," said Ranjeev. "It was a dream that he strived towards and gave him the will to try and get better."

Already knowing what fundraising challenge he wanted to do, Ranjeev chose to support Leuka knowing "how much support the charity gives to world class research, and the history Leuka has with Hammersmith Hospital where my brother was treated by specialists. They looked after him and gave him the most cutting-edge treatments to extend his chances of survival."

Climbing the highest mountain in Africa is no mean feat! How did he prepare? He did so, Ranjeev told us, by taking on yet another type of challenge: "climbing Kilimanjaro is more about stamina, endurance and the mental challenge than supreme fitness. So the best way I found to prepare for it was to train for a half marathon.

The climb itself was challenging as you have to deal with a contrast of climates from tropical rainforest to high altitude with a drop in temperature. There is a point at which the thin air due to altitude challenges everyone regardless of fitness: some had nausea and headaches which made it hard to sleep. The lack of sleep added to the fatigue, but ultimately everyone enjoyed it."

We asked him what powered him through to the top? "The group banter that we had on the way up got me through! But my main drive to reach the top was to hit the summit 9 years to the day my brother lost his struggle with leukaemia. Just doing the climb was an achievement and reaching the summit completed a life-long dream for my brother and myself."

Ranjeev completed this incredible challenge on our behalf, raising over £2,500 for leukaemia research. For those of you considering climbing to Uruhu peak for us in 2018, Ranjeev left us with this sage advice:

"Prepare well, take the right equipment and listen to your body and guides you go with, most of all enjoy it as much as you can. Take in all the magnificent views!"

> "My main drive to reach the top was to hit the summit 9 years to the day my brother lost his struggle with leukaemia.

Mini Masters is a hole in one for Leuka

Without a doubt the greatest day in Leuka's sporting calendar.

Hosted by Leuka patron, actor Dougray Scott, the celeb-studded event has been dubbed 'the fifth major' by its participants.

Stars like Philip Glenister and James Nesbitt joined Dougray in donning their cleats for charity. Thankfully rain didn't stop play, and the day dawned beautifully sunny and bright. We were joined by an excellent team of volunteers from Net a Porter, who helped us raise £30,000 by the end of the day.

After a fierce competition on the impeccable Duke Meadows course in Chiswick, players bid to win amazing auction prizes like the once-in-a-lifetime opportunity for a round of golf with Europe Ryder Cup player Andrew Coltart. The auction was led by ex-Christie's auctioneer, Hugh Edmeades.

Dan Davies, co-founder of the event, said, "The 2017 Mini Masters in aid of Leuka was a huge success. We raised over £30,000 for Leuka and aim to do even better at the 2018 event, which will mark the 10th anniversary of The Mini Masters!"

The 2017 winning team was Blue449, captained by international tennis player, Greg Rusedski.

2018's Mini Masters will again be held at the beautiful Dukes Meadows course by the River Thames in Chiswick, on Friday 20th July. To find out more about the event visit **www.leuka.org.uk/minimasters**

> "We aim to do even better at the 2018 Mini Masters that will mark its 10th anniversary.

Dan Davies and James Nesbitt at the 2017 Mini Masters

> It is a real celebration of what an industry can do when it comes together for a great cause.

Cooking up a storm against cancer

Who's Cooking Dinner? continues to go from strength to strength.

Where else would you find 20 of the UK's top chefs - with 15 Michelin stars between them - cooking side-by side in the same kitchen for 200 guests in one of London's most beautiful dining rooms for just one service? Only an extraordinary cause could command such an unrivalled line-up and unforgettable dining experience.

2017's event featured household name Chefs such as Mark Hix, Helene Darroze of the Connaught and Tom Kerridge from the Hand and Flowers – the only pub in the UK to sport two Michelin Stars!

The phenomenal evening, hosted by Four Seasons Hotel London at Park Lane, raised an amazing £542,000 towards Leuka's research that includes ground-breaking work on MLL leukaemic cells in children. Sadly children with mixed lineage leukaemia have a poor prognosis and that's why Dr Maria Esposito is researching to find better, more effective treatments.

Our Chief Executive Olive Boles said of the evening "The professionalism, the passion and the sheer generosity of spirit is awe-inspiring. Long may it continue"

Next year's Who's Cooking Dinner will take place on 5th March 2018 at the Rosewood London. It will be the dinner's 19th anniversary.

WHO'S leuka COOKING DINNER

#TeamLeuka

Kate and Dave Billmore

"When I run I think, "Dave can't run...but I can" and that I ought to make the most of what I can do."

After her husband was diagnosed with leukaemia for a third time, Kate Billmore decided she didn't want to sit still. Kate Billmore from Haxey near Doncaster ran for Leuka in 2017, taking part in the Turbary Trail Race on 10th December.

She ran to raise money, she ran for research, but most of all she ran for her husband Dave. Before the race Kate told us, "it'll be seven miles of a cold and muddy struggle for me, compared with Dave's (already) four years of a very different struggle," Kate said, "but if someone can find a cure for this disease, or better still, prevent it from starting in the first place, I'll run and run until they do."

After first being diagnosed in 2013, Dave received chemotherapy and a stem cell transplant that put him into remission. Sadly the leukaemia returned, and Dave received a second transplant, and while it helped for a short time, unfortunately the cancer returned again. Dave is no longer a candidate for stem cell transplantation, but is receiving treatment from Doncaster hospital.

Kate tackled the Turbary Tinsel Trail race, seven undulating miles in December's chilly weather for Leuka, to help raise money for our vital research.

Fitting in her training was tough, but Kate managed to find the time, saying that her training went "in fits and starts, depending on Dave, the weather and how weary I felt!"

On the day Kate ran a fantastic race, finishing 4th in her age group (women over 60) and "ahead of lots of much younger people, which always feels good!" Kate absolutely smashed her £500 target, raising a phenomenal £1228 for our work.

Hearts to remember

This year saw the return of our Christmas campaign.

Christmas can be a difficult time of year for friends and family who are remembering loved ones, or who are supporting patients through their illness. Our purple hearts gave supporters a chance to honour or remember their loved ones by putting them pride of place on the Christmas tree.

We loved receiving your photos of the hearts next to beautiful Christmas decorations! They adorned office reindeers and hung next to twinkling tree lights and running medals. And best of all, every penny they raised will go towards helping researchers find better treatments for leukaemia and blood cancers!

Thank you to all our fundraisers.

In 2017 you swam, ran, golfed, held concerts and even climbed mountains for Leuka, all to raise much needed funds. Every donation, however big or small, is vital to our research effort. We truly appreciate each and every one who gives their time or money to help us beat leukaemia. **Thank you.**

"A huge thank you to all our supporters, fundraisers, researchers and medical staff for a successful 2017.

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