



INTRODUCING THE ICR'S CHIEF EXECUTIVE:

Professor Alan Ashworth FRS shares his vision for cancer research

Patients with gastrointestinal cancers to benefit from personalised medicine

Help-run-a-lab: How much does cancer research cost?

Advanced prostate cancer: Approval for new drug abiraterone

CANCER IS THE PLAGUE OF OUR TIMES. IT CUTS SHORT THE LIVES OF ONE IN SEVEN WORLDWIDE.



The Institute of Cancer Research (ICR) is a global centre of excellence founded in 1909. We are a college of the University of London employing over 800 scientists drawn from 55 countries.

No other academic organisation in the world has discovered and developed more anti-cancer drugs in recent years. We also lead the world in cancer genetics.

Research is the key to improved treatment and, with our bench to bedside facilities, the ICR is uniquely placed to bring efficiency and speed to research, forming a comprehensive cancer centre with The Royal Marsden Hospital.

The ICR's single focus on cancer research, ranging from biology through to drug development, is our strength admired worldwide.

To do the maximum for our cause, we need an ever greater number of donors to strengthen our resolve to vanquish cancer. Please help us, world leaders in cancer research, to save and extend lives.

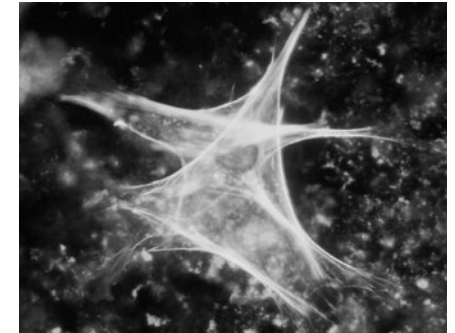
Lord Ryder of Wensum OBE, *Chairman*

CANCER STATISTICS

- In the UK, more than one in three people will develop some form of cancer during their lifetime.
- The chances of surviving the disease for at least 10 years have doubled to almost 50% in the past 30 years; however, cancer remains the cause of one in four of all deaths in the UK.
- An estimated 12.7 million new cancer cases and 7.6 million deaths occur each year globally. It is predicted that these figures will almost double by 2030 if current rates continue.
- Time and money are the only factors influencing the success of research into cancer. The more scientists yield results, the greater the pool of knowledge informing all areas of cancer research. Technological developments over the past 10 years have vastly increased our capabilities and this is set to accelerate.

PERSONALISED MEDICINE FOR GASTROINTESTINAL CANCERS

A revolution is taking place in the way that cancer is treated. Tumours are increasingly being targeted with individualised therapies based on a vastly increased understanding of the biology and genetics of cancer. The ICR is one of the pioneers of this revolution.



With a new Centre for Molecular Pathology currently being built on our Sutton site in Surrey, we are raising funds towards targeted therapy research for certain cancers. One such group of cancers are those found in the gastrointestinal tract: colorectal and oesophageal cancers.

Colorectal or bowel cancer is the second most common cause of cancer death in the UK after lung cancer. Risk factors include age, previous colorectal cancer, previous polyps, lifestyle factors – including diets high in red meat and fat, smoking and obesity – and Crohn's disease.

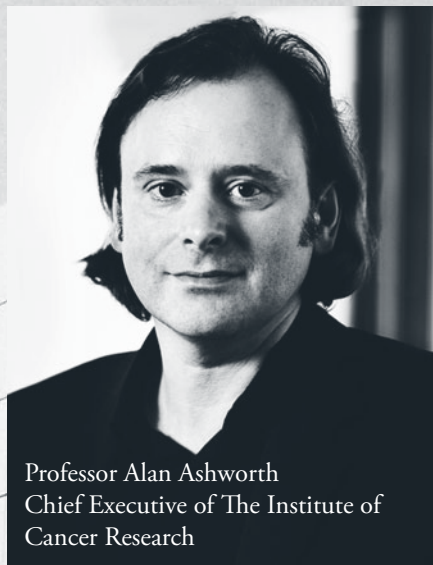
Since the 1970s the incidence of oesophageal cancer in the UK has increased by more than 50% in men and by almost 20%

in women. The prognosis for patients with oesophageal cancer is very poor, with a fraction of patients surviving five years after diagnosis. It is the sixth most common cause of cancer death in the UK.

The Centre for Molecular Pathology's focus on gastrointestinal cancers will speed up the search for molecular alterations that drive these cancers' growth, paving the way for the development of prognostic tests and new targeted treatments.

Our research will be directed by acknowledged leaders in the field, drawn from existing senior ICR and Royal Marsden staff and from newly appointed specialists in molecular pathology.

We are approaching a number of Charitable Trusts and Foundations to fund a Faculty position and the team of scientific staff. We also seek funding for research consumables, costing £15,000 for one scientist in the team over the course of a year. Please help us make the necessary research advances in this prevalent cancer group.



Professor Alan Ashworth
Chief Executive of The Institute of
Cancer Research

The Sir Richard Doll building on the ICR's Sutton site

ALAN ASHWORTH: INTRODUCING THE ICR'S CHIEF EXECUTIVE

For this issue of New Dawn, we asked Professor Alan Ashworth FRS, our leader since January 2011, a few questions about his work at the forefront of cancer research and his vision for the future.

Professor Ashworth, congratulations on your appointment as Chief Executive earlier this year.

I am thrilled to be leading an organisation that has been instrumental in changing the lives of people with cancer. Our focus at the ICR is on research that can be quickly translated into better care for patients, bringing maximum benefit – and our partnership with The Royal Marsden helps to make this a reality.

Your recent work has been to identify drugs that target the genetic weaknesses in cancer. How does that work?

'Synthetic lethality' uses a cancer's own genetic defects as an Achilles' heel, effectively killing the cancer cell but leaving other cells untouched. Our recent work used this approach to develop a treatment for patients with inherited breast cancers due to faults in the genes BRCA1 or 2. Cancers with a defect in either of these genes are unable to repair their DNA. To keep growing, the cancer cell uses a back-up pathway utilising a protein called PARP. We found that if we inhibited this protein we took out the back-up pathway. The cancer cells were then unable to repair their DNA and died.

What does that mean for patients?

What was very exciting about this work was how quickly we were able to take what we learned in the lab to treating patients with BRCA1/2 mutations, including patients with breast, ovarian and prostate cancer. The first trials of this approach were done in the ICR and The Royal Marsden. This concept of 'synthetic

lethality' and treating cancer by exploiting an Achilles' heel is now being tested, with success, in a variety of clinical trials across the world.

Survival rates for cancer have improved over the past 30 years. Do you think this trend will continue?

I truly believe we are making huge strides in the way we treat cancer. The human genome was sequenced just over ten years ago and this achievement has transformed our understanding of cancer. Since we know far more than we did ten years ago about how cancer occurs and the genes that drive the disease, we can be smarter in the way we treat patients.

How do you see treatments changing?

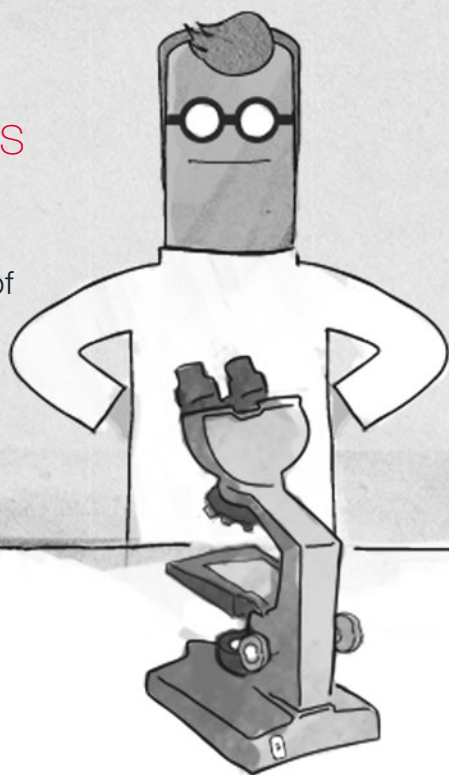
Currently we have a one-size-fits-most approach to treating cancer. Now there is the potential to develop a personalised approach to treatment and we are starting to see new targeted medicines in the clinic. These therapies are, and will be in the future, highly potent and have only mild side-effects.

You have a real passion for developing 'personalised medicine' – what does it actually mean?

Genetic tests of tumours to determine treatment are already here. The day is coming soon when whole tumour genomes will be routinely analysed in the clinic. Their treatment will then be based on these genetic changes, dramatically improving the effectiveness of their care. I'm proud that our scientists and clinicians are at the forefront of developing personalised cancer medicine.

BAISIC RESEARCH COSTS HELP RUN A LAB

The ICR has launched a new microsite, offering a virtual tour of a cancer research laboratory...



While much of our fundraising effort is focused on large-scale projects and particular areas of research, the ICR also requires continual support for basic research that takes place in its laboratories. Without such research, it would be impossible for us to make progress in the fight against cancer.

ICR scientists rely on a number of practical items, which they use in their labs on a daily basis. Help-Run-a-Lab is a new microsite that aims to educate the public on the costs of these basic items.

The site consists of a user-friendly, interactive virtual tour that demonstrates how basic pieces of equipment, consumables and computers are necessary in cancer research. It presents our ongoing need for support.

Every donation can be put to good use in an ICR lab. And, because you are giving directly to a research institution, your gifts have a direct impact on research into cancer.

Visit www.help-run-a-lab.org to take the tour.

SOME EXAMPLES OF TYPICAL ITEMS ARE:

- Microscopes (£4,500);
- Centrifuges (£1,500), to spin liquid samples at high speed in order to separate them into different components;
- Computers and software (£1,000), to process, store and analyse data;
- Fridges (£500) – up to 50 in a lab – to store heat-sensitive samples.

RECENT FINDINGS IDENTIFYING LEUKAEMIA

Scientists at the ICR have developed tests that may help identify children at risk of leukaemia relapse, and have identified adult patients who would most benefit from experimental treatments.

Leukaemia “stem cells” can lie dormant in the body for a decade or more after a child achieves remission before being reactivated and causing a relapse, a new ICR study has shown.

Senior author Professor Mel Greaves cautioned that the findings should not unduly concern parents whose children have previously suffered acute lymphoblastic leukaemia (ALL), as the leukaemia returning after very many years of remission is rare. Also, the late relapse is usually genetically similar to the original cancer and the same treatment is likely to put them into remission once again.

In the study, published in the journal *Blood*, the scientists scanned the DNA of cancer samples taken from 21 patients at first diagnosis and then at relapse. All the patients were aged on average 4.5 years at diagnosis, with first relapse up to ten years later.

The study findings also raise the possibility that patients at risk of the cancer returning could be identified by using sensitive molecular screening methods to look for persisting stem cells.

“It may be possible to examine patients once they have finished treatment - usually two to three years after diagnosis - and determine if they still have a reservoir of leukaemic stem

cells and therefore potential for relapse,” lead author Frederik van Delft from the ICR said.

A second team of ICR scientists has found that a genetic test can be used to identify patients with the most common type of adult leukaemia who will not respond well to currently available drugs and should instead be considered for experimental treatments.

Writing in the *Journal of Clinical Oncology* on 1 June, the researchers said that anyone diagnosed with progressive chronic lymphocytic leukaemia (CLL) should be tested for the presence of the TP53 gene mutation before starting any treatment.

“Patients with the mutation are unfortunately less likely to respond to existing drugs and their five-year survival is much lower,” lead author David Gonzalez de Castro from the ICR said. “Instead of receiving drugs that are unlikely to help them, patients with this mutation should be first in line for clinical trials of experimental treatments.”

CLL is usually treated with chemotherapy and more recently this has been combined with immunotherapy. A number of new drugs for CLL are at clinical trial stage, while other experimental treatments include transplants of bone marrow, stem cells or cord blood.

Please help the ICR's paediatric cancer researchers continue to make improvements in the lab. For example, £3,000 would pay for the sequencing of one childhood cancer genome.

GREEN LIGHT FOR ABIRATERONE

Prostate cancer drug abiraterone, discovered at the ICR, officially launched in the UK on 21 September, following approval for use in Europe on 7 September.



A life-extending new drug to treat patients with advanced prostate cancer, discovered and developed at the ICR, has received its UK licence.

Abiraterone acetate, marketed by Janssen under the trade name ZYTIGA®, has been shown in clinical trials to prolong survival for men with advanced prostate cancer. An estimated 10,500 men in the UK have advanced prostate cancer that has become resistant to standard hormone treatments.

Abiraterone works by blocking the synthesis of testosterone in all tissues including the tumour itself, not just the testes. This testosterone would otherwise continue to fuel prostate cancer growth and spread.

The ICR's Chief Executive, Professor Ashworth, commented: "The announcement marks the culmination of two decades of work at the ICR to design and develop this drug. This significant achievement underlines the importance of drug discovery work in the not-for-profit sector."

Professor Johann de Bono, the ICR scientist and Royal Marsden clinician who developed abiraterone, said: "Clinical trials have proven that abiraterone acetate prolongs life and in some men it can improve their quality of life. We expect that the drug will play a part

in turning prostate cancer into a chronic, rather than life-threatening, disease."

A decision by NICE on whether abiraterone should be made available within the NHS is expected by mid-2012. Until then, Primary Care Trusts and Cancer Networks can decide whether to fund the drug for NHS patients, or doctors can apply to the Cancer Drugs Fund. Patients can also access abiraterone through private health care.

Prostate cancer is the most common male cancer in the UK, with more than 37,000 new cases diagnosed annually. Around 10,000 men die of the disease every year, almost all from its castration-resistant form.

The new treatment was approved by the US Food and Drug Administration (FDA) on 28 April 2011.

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"Abiraterone acetate represents a major progression in prostate cancer treatment"
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We hope that you will consider supporting our research and help us to make advances in our understanding and treatment of cancer for the benefit of patients worldwide. Please make cheques payable to The Institute of Cancer Research.

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