
Annual Review 2009
Centenary Edition



Danni Fan, one of the new
Institute of Cancer Research
PhD students from China, looks
through one of the 1909 Cancer
Reports from the Institute of
Cancer Research's library archive

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1851
The surgeon Mr William Marsden establishes The Free Cancer Hospital (later to become The Cancer Hospital). Both observational and pathological cancer research begin immediately

Vision & Mission

From our beginnings as a small research laboratory, The Institute of Cancer Research (ICR) has grown to be one of the largest independent cancer organisations in the world.

In our centenary year, we look back on the ICR's contribution to the advances made over the past century; but we also look to the future – a future in which we will continue to deliver our mission of 'relieving human suffering by pursuing excellence in the fight against cancer'.

Our Vision

That people may live their lives free from fear of cancer as a life-threatening disease.

Our Mission

To relieve human suffering by pursuing excellence in the fight against cancer, through:

- Research into the causes, prevention, diagnosis and methods of treatment of cancer
- Education and advanced training of medical and scientific staff
- Treatment and care of the highest quality for cancer patients
- Attraction and development of resources to the optimum effect

1909

The ICR dates its foundation to 1909 when a new laboratory building, adjoining The Cancer Hospital, was established under the name of The Cancer Hospital Research Institute. Dr Alexander Paine is appointed as Director



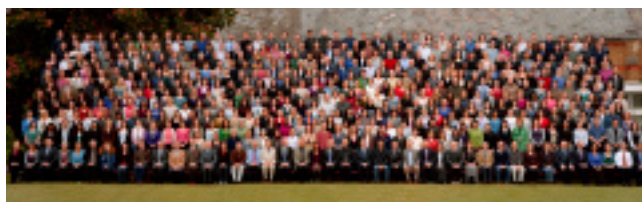
1910

Dr Robert Knox heads the Electrical Radio-therapeutic Department at The Cancer Hospital and establishes the first professionally designed X-ray Department in Britain



Chairman's Introduction

Lord Ryder of Wensum
Chairman of the ICR



Sutton

“The brilliance and dedication of our scientists have given the ICR international pre-eminence which was recognised by the Government’s Research Assessment Exercise which rated the work of the United Kingdom’s universities. This ranked us top of the academic excellence league, with more of our research rated ‘world leading’ and ‘internationally excellent’ than any other university large or small.”

Lord Richard Ryder

This time last year, I emphasised that the ICR’s founding fathers would be proud of their heirs and successors a century later. Generation after generation of scientists here have helped to create a global centre of excellence.

We employ over 800 scientists drawn from more than 50 countries – proof that the ICR attracts the world’s outstanding scientists in their specialised fields. I offer tribute to these men and women, and praise their achievements.

They are led with great skill and energy by Professor Peter Rigby, our Chief Executive.



1911

The Cancer Hospital Research Institute is officially opened by Prince Arthur, the Duke of Connaught (brother of King Edward VII, whose family was afflicted by cancer)





Chelsea

We now have over 800 scientists and clinicians from all over the world working in cancer research, driving many of the major advances of recent years including work on the genetics of cancer and the development of innovative new drugs

Peter, and his predecessors, have been supported for 32 years by Jonathan Kipling our Secretary. Together with his wife Marjorie, the couple have worked for the ICR for over 70 years. Jonathan has retired and Marjorie plans to retire in May 2010.

Jonathan was the ICR's institutional memory. He guided us through political and bureaucratic thickets with dexterity and style. His passion for the ICR was truly the voice of his soul. I thank him and Marjorie for their service and devotion to our cause, and wish them a long, happy retirement.

We must continue to boost our revenue streams especially during a recession when Government funding has been reduced already.

I underline my deepest gratitude to our countless benefactors whose generosity helps our scientists to even greater successes. I also express gratitude to our funding partners in the private and public sectors for the scale of their generosity and support.

Finally, I very much appreciate the strength of our working relationship with The Royal Marsden, our sister organisation. Together we present a mighty force in the fight against cancer.

Richard Lyder

1921

Professor Archibald Leitch becomes Director of The Cancer Hospital Research Institute. Shale oil, a lubricant for industrial machines, is found to be the cause of scrotal cancer in male cotton mule spinners



1922

Professor Sir Ernest Kennaway FRS joins The Cancer Hospital Research Institute and, along with Dr Frank Goulten, he attempts to isolate the chemicals in tar that cause tumours



Chief Executive's Review

Professor Peter Rigby FMedSci
Chief Executive of the ICR

The mission of the ICR is very clear. We seek 'to relieve human suffering by pursuing excellence in the fight against cancer'. In pursuit of this mission we undertake research of the highest international standards into the causes, mechanisms and treatment of the disease. The quality of our research is widely recognised, most notably by the 2008 Research Assessment Exercise in which the ICR achieved the highest rating of any university in the UK submitting work in multiple subjects, with 79% of our work rated as 'world-leading' or 'internationally excellent'.

In 2009 we celebrated our Centenary. As this Review makes clear, over the past 100 years the ICR has contributed enormously to both our fundamental

knowledge of cancer, and to the development of new ways of treating the disease. But an anniversary like this is not only an occasion for celebrating past successes, it is also a stimulus to serious thinking about how we should organise ourselves for the work of the next decades.

The ICR and its very close partner, The Royal Marsden NHS Foundation Trust, form the largest Comprehensive Cancer Centre in Europe, ranked as one of the top four cancer institutions in the world. While we have been very successful, we know we can do better, and in 2009 we began a major review of our research strategies and of the infrastructures required to support them. The integration of laboratory research and clinical practice works extremely well in some areas. But this integration holds the key to tailoring treatment to the individual patient's disease and we need to generalise it. We have therefore appointed Professors Alan Ashworth, Director of the Breakthrough Breast Cancer Research Centre in the ICR, and David Cunningham, Head of the Gastro-Intestinal Cancer Unit in The Royal Marsden, as Co-Directors of Research Integration. Their remit is to ensure science and clinical practice act synergistically to benefit patients across the entire spectrum of our activities.

The first major output of this process will be the construction, on our Sutton campus, of the Centre for Molecular Pathology. We are very grateful for the generous funding that we have received from the National Institute for Health Research and the Wolfson Foundation. The Centre will put in place the most modern techniques for the analysis of the genetic constitution of patients and their tumours. We expect that in this way we will be able to classify cancers so that each patient is treated according to a protocol



1927
The Cancer Hospital
Research Institute becomes
a post-graduate School of
the University of London.
PhD students begin to submit
their work



that is appropriate to their particular disease.

Much of this effort will build upon our ever-increasing understanding of the genetic basis of cancer, an endeavour that began in 1964 when ICR scientists Peter Brookes and Philip Lawley showed that carcinogens act by damaging DNA. We plan to significantly increase our capacity for analysing the genetic constitution of tumours, and, we will invest in major, new high-performance computing facilities which will enable sophisticated analyses of the data.

Over the last two years we have begun a new initiative in integrated network biology. This has involved us in hiring four new, young members of the faculty, all of whom have crossed the Atlantic to work at the ICR, and equipping them with state of the art facilities for mass spectrometry, high-content microscopy and advanced computing. These computing facilities will be interfaced with those for genetics, imaging and other areas of science to give us outstanding capacity in this area.

We have an unparalleled record in the development of new anticancer drugs, and many of our past achievements are recorded in the pages of this Review. Looking to the future, we have great hopes of our new drug abiraterone, which has been designed to treat men with advanced prostate cancer. The results of the Phase I and Phase II trials have been enormously encouraging and we now await the results of the Phase III trial which should report during 2010.

In 1995 Professors Alan Ashworth and Mike Stratton and their colleagues reported the isolation of the breast cancer susceptibility gene *BRCA2*. Many laboratories worked to reveal the role of *BRCA2* in repairing

damage to DNA. In a highly productive collaboration with KuDOS Pharmaceuticals, a company founded by Professor Steve Jackson, from the Wellcome Trust/Cancer Research UK Gurdon Institute in Cambridge and now owned by AstraZeneca, Professor Ashworth and his colleagues showed that tumours defective in *BRCA1* and *BRCA2* are exquisitely sensitive to inhibitors of an enzyme involved in another DNA repair pathway. The Phase I clinical trial of these PARP inhibitors reported in 2009 and the results were greeted with great acclaim. This work is an outstanding example of our bench to bedside approach in which science of the highest quality is translated into effective new treatments. Moreover, there are three molecules developed at the ICR, in the Cancer Research UK Centre for Cancer Therapeutics, currently in Phase I trial in The Royal Marsden's Drug Development Unit and we look forward to news of their clinical performance.

We were delighted to learn last September that Professor Ashworth had been awarded the Lifetime Achievement Award of the European Society for Medical Oncology in recognition of his pioneering work. We also congratulate Richard Marais, Professor of Molecular Oncology, on his election to Membership of the European Molecular Biology Organisation.

I am extremely proud of my colleagues, who continue to produce world-leading work in so many areas of cancer research. I am confident that the ICR, in its unique partnership with The Royal Marsden, will continue to fulfil its mission in an exemplary fashion.

Peter W. J. Rigby

1931

Professor Sir Ernest Kennaway FRS becomes Director of The Cancer Hospital Research Institute

1932

Professor Sir Ernest Kennaway FRS fractionates coal tar and isolates benzo[a]pyrene, which is identified as the chemical constituent which induces cancer in mice. These are the first research findings to show that a pure chemical substance can cause cancer

1936

Professor Sir Ernest Kennaway FRS proposes the potential link between smoking and lung cancer



Centenary Events

This year, in celebration of 100 years at the forefront of the fight against cancer, we ran a series of special centenary events.

Centenary Lectures Series

To mark our centenary year, the ICR held an extended series of distinguished lectures from keynote speakers from around the world, which were open to staff and students. The lectures covered a diverse and interesting range of topics including: genome-wide association studies, breast cancer pathways and the contribution of medical physics to radiotherapy.

Public Lecture

In May, as well as running centenary events for scientists, the ICR opened its doors to the public when it held a lecture entitled 'Cancer: Unpicking the Enigma'.

The lecture was given by three of the ICR's top scientists: Professors Clare Isacke, Mel Greaves, and Dr Johann de Bono, each of whom talked on a different topic. Professor Isacke went some way to answering the question 'What is cancer?', Professor Greaves explained 'What causes cancer?', and Dr de Bono highlighted 'The challenges of treatment'.

Communicating complex scientific ideas to a non-scientific audience can be difficult; however, the speakers successfully accomplished the task by giving compelling talks and using analogies to explain complicated concepts. Their lectures did much to improve public understanding of a disease so often misunderstood.

1939

The Cancer Hospital Research Institute expands and moves to a new site on Fulham Road, London. The new Chester Beatty Research Institute building is named after its benefactor – Sir Alfred Chester Beatty



1942

Professor Sir Alexander Haddow FRS starts to publish papers confirming that certain chemicals can benefit cancer patients, laying the foundation of chemotherapy as a cancer treatment in Britain



1946

Professor Sir Alexander Haddow FRS becomes the Director of the Chester Beatty Research Institute. He steers research towards the development of cancer chemotherapy and helps to set up drug trials in collaboration with The Royal Cancer Hospital





The ICR centenary conference was a great success and was attended by nearly 800 people from across the country and around the globe



Professor Peter Rigby summarises the last 100 years of the ICR

Centenary Conference

In June, the ICR held a three-day conference on the theme of 'Cancer Genes: Discovery and Exploitation' at the Queen Elizabeth II Conference Centre in Westminster, London. Opening the conference, Professor Peter Rigby, Chief Executive, gave a fascinating and informative historical overview of the ICR's first 100 years.

Scientists from the ICR presented their work, alongside eminent external speakers from all over the world. There were two keynote lectures given by Professor Sir David Lane, Director of the Cancer Research UK Cell Transformation Research Group at the University of Dundee, and Professor Alan Hall, Chair of Cell Biology at the prestigious Sloan-Kettering Institute in New York. Professor Sir Lane was knighted in 2000 for his contribution to cancer research and Professor Hall, who was a molecular biologist at the ICR in the 1980s and early 1990s, was awarded an Honorary Degree by the ICR in November this year in recognition of his achievements in cancer research. A successful poster exhibition was also held at the conference, enabling ICR students and staff to showcase their work alongside the latest findings of external organisations. Professor Rigby closed the proceedings by remarking on the outstanding quality of the science presented at the meeting, and the need to continue exploiting knowledge of genetics to tackle cancer in the future.

Sixth Form Student Event

In November, as part of the centenary, the ICR hosted a half-day event for sixth form students at the Sutton site. A total of 52 students and teachers participated. Professor Mel Greaves gave an overview of cancer research and the students were taken on a tour of the laboratories. Demonstrations were also given, providing an insight into the equipment and techniques used by scientists. The teachers and students commented that the event was both enjoyable and informative, and a number of students are considering a career in science as a result.

Centenary Award Ceremony

One of the final events of the centenary year was the ICR's Centenary Honorary Degrees and Award Ceremony, which was held at the end of November at the University of London. Five Honorary Degrees were presented to: Professor Alan Hall, Professor Jacques Miller (in absentia), Professor Robert Souhami, Sir Kenneth Stowe and Professor Ian Tannock. Also presented were Degrees to graduating students and other Fellowships; Memberships and Associateships of The Institute were also awarded. The University of London Vice Chancellor Sir Graeme Davies attended the Award Ceremony and conferred the Degrees. A lively reception followed.

1947

Professor David Galton becomes the first physician in the world to use aminopterin (the forerunner of the methotrexate drug) in the treatment of adult leukaemia, producing remission in some cancer patients

1950s

The Chester Beatty Research Institute develops three successful chemotherapy drugs: busulphan (Myleran), chlorambucil (Leukeran) and melphalan (Alkeran) – all of which are still used today



Fundraising Events for the Centenary

The ICR's centenary year has seen a wide variety of events to help raise both awareness of our work and funds to support that work.

ICR Global Foundation Launch

In March, ICR supporters Aundrea and Jim Amine hosted an event to launch the ICR Global Foundation, a US charity that will enable Americans to make tax efficient donations to support global cancer research.

Centenary Dinner

Also in March, the ICR hosted a Centenary Dinner at the Saatchi Gallery, London.

A dedicated Committee chaired by Lady Otton arranged this sophisticated event attended by 380 guests, who were influential people from all over Europe, and who helped to raise well over £260,000 from the event itself. Importantly, the event enabled the ICR to highlight our research excellence to a new audience.

1952

Dr Eric Boyland at The Chester Beatty Research Institute proposes that certain chemicals that cause cancer react with DNA through an alkylation mechanism. This chemical modification damages the DNA molecule and can lead to mutation events



1954

The Chester Beatty Research Institute is officially renamed as The Institute of Cancer Research (ICR)



1956

Professor KS Kirby works on the phenol method of isolating nucleic acids

The ICR expands onto a second campus in Sutton, Surrey





Guests at the Centenary Dinner



Professor Peter Rigby, Lady Helen Otton and Professor Paul Workman at the Centenary Dinner

Jump 100

In May we launched Jump 100, an opportunity for many ICR supporters (and quite a few scientists!) to participate in a sponsored tandem skydive.

The objective was to raise funds while marking the centenary in style by recruiting 100 participants. This now looks set to be surpassed by some considerable number, as more and more sign up!

100 Faces Campaign

In the summer, the ICR 100 Faces Campaign brought the human element of our work alive with a new website; www.icr100.org.

Here, 100 people, whose lives have been affected by cancer, tell their stories. Some are sad. Many are inspiring. All, however, are linked by the underlying hope that cancer may, one day soon, cease to be the life-threatening disease that it is now.



“After 5 very exciting years doing research at the ICR, swapping my lab coat for a parachute to raise money for science seemed like the obvious thing to do...”

Dr Gert Attard, one of the ICR scientists who took part in the Jump 100 event

Identification of Cancer Genes by Whole Genome Association Studies

Professor Richard Houlston MD PhD FRCP FRCPath

Professor of Molecular Population Genetics in the Section of Cancer Genetics at the ICR & Honorary Consultant at The Royal Marsden NHS Foundation Trust.

Most cancers arise from the complex interplay between environmental factors and inherited genetic factors. Recent data indicate that much of the inherited susceptibility to cancer is a consequence of the co-inheritance of multiple genetic variants. Many of these variants are common in the population, but when combined, they have an additive effect on an individual's cancer risk. Following the sequencing of the human genome, over 10 million genetic variants have been identified. New technologies have led to the development of analytical platforms whereby it is possible to identify cancer genes by looking for differences in the frequency of these genetic variants in people with cancer and healthy individuals. These so-called genome-wide association studies (GWAS) have led to a greater understanding of inherited susceptibility to cancer. They allow better prediction of an individual's level of risk of developing cancer and have provided further insight into the underlying basis of cancer development. By using the information generated from GWAS, cancer can be detected earlier and more accurately and, as a result, a more effective treatment plan for the patient can be chosen.

Scientists at the ICR have applied the GWAS approach to four of the most common cancers, breast, colorectal, lung and prostate, in addition to the major haematological cancer – acute lymphoblastic leukaemia. In all cases, these explorations have paid handsome dividends with fresh insights into the biological basis of how cancers develop. In addition to examining these cancers, GWAS has allowed ICR scientists to identify the first genes predisposing to both the major form of brain tumour (glioma) and testicular cancer.

1961

Professor Jacques Miller discovers the immunological role of the thymus, as the repository of a special class of lymphocytes (T cells) essential for the mounting of an immune response



1964

Professors Peter Brookes and Philip Lawley prove that carcinogens act on DNA in the formation of tumours, proving that cancer is a genetic disease based on mutation events



1964

Dr Ernest Johns purifies histones; these proteins keep DNA tightly wound in the cell nucleus. In 1973, he discovers the 'high-mobility group' proteins involved in chromosome structure



It will be a challenge to identify the mechanism by which these genetic variants affect cancer development. However, determining how cancer is caused may prove highly informative, by either endorsing new hypotheses on what causes cancer, or suggesting new hypotheses that can be tested through studies that focus on genes and the environment.

Emerging technologies such as high-throughput sequencing will allow an even more detailed analysis to be conducted and will provide further insight into the biological basis of cancer development. Hence GWAS is not the end, it is not even the beginning of the end; but it is, perhaps, the end of the beginning of the analysis of how genetic variation impacts on an individual's risk of developing cancer.

1970

Professor Sir Tom Symington becomes Director of the ICR



“Scientists in the Section of Cancer Genetics are successfully using a powerful new technique, known as a genome-wide association study, to identify common genetic variants that influence an individual's risk of developing cancer”

Professor Richard Houlston



Molecular Interactions Behind Cancer Cell Motility Identified

Professor David Barford FRS FMedSci¹ & Professor Chris Marshall FRS FMedSci²

¹Professor of Molecular Biology, Chairman of the Section of Structural Biology at the ICR.

²Professor of Cell Biology, Chairman of the Section of Cell and Molecular Biology and Director of the Cancer Research UK Centre for Cell and Molecular Biology, Director of Research at the ICR & Chairman of the Joint Research Committee of the ICR & The Royal Marsden NHS Foundation Trust.

“The structure of DOCK9^{DHR2} in complex with Cdc42 provides a molecular explanation for how this unconventional family of GEFs activates Rho GTPases. This will provide a framework for structure-based drug design efforts to develop inhibitors of DOCK proteins that block activation of Rho GTPases, and hence metastasis.”

Professor David Barford



Three-dimensional view of DOCK9 interacting with Cdc42.

Metastatic cancer cells, those that can spread to other parts of the body, are highly motile. Key molecular components involved in cell motility are a family of proteins called Rho GTPases. They function as molecular switches to control the dynamic rearrangements of the protein scaffold of the cell, the actin cytoskeleton. These rearrangements drive cell motility. The work of ICR scientists, from the Section of Structural Biology and the Cancer Research UK Centre for Cell and Molecular Biology, shows for the first time, in molecular detail, how Rho GTPases are activated by another group of proteins, the DOCK family of guanine nucleotide exchange factors (GEFs). The scientists looked at the three-dimensional structure of a member of the DOCK family, DOCK9, in complex with a specific Rho family GTPase, called Cdc42. By looking at a specific part of the DOCK9 protein that is crucial for its activity – the catalytic domain – they identified a new mechanism of its activation, and, for the first time, defined the complete cycle a GEF goes through in its activation and deactivation. Critical to this process is a sensor within the catalytic domain of DOCK9 that activates Cdc42 and then releases the activated Cdc42.

“A large number of studies, including our own, have shown important roles of DOCK proteins in metastasis. It is extremely satisfying to see how these proteins function at the molecular level and thereby provide the first step to developing them as drug targets.”

Professor Chris Marshall

1971

Scientists at the ICR visit Dr Barnett Rosenberg in the US to discuss his organoplatinum compounds. As a result, the ICR sets up the first trials of the platinum-based drug cisplatin. In 1978, the US Food and Drug Administration approves cisplatin for clinical practice



1977

Professor Leonard Lamerton becomes Director of the ICR



1970-1978

Scientists at the ICR evaluate 300 different platinum-containing molecules, leading to the discovery and development of the anticancer drug carboplatin (Paraplatin). Clinical trials start in 1981; approval is given in 1989

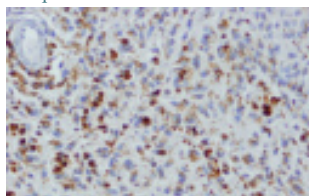


Genetic Clue to Combination Treatments for Childhood Brain Tumours

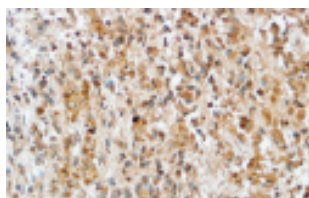
Dr Chris Jones PhD

Team Leader of the Paediatric Molecular Pathology Team, Section of Paediatric Oncology at the ICR.

Paediatric high grade glioma samples



Mutation in the *EGFR* gene (*EGFRvIII*) shown in brown, which is also found in adult cases of glioma.



PDGFRA gene expression shown in brown, which appears to be more frequent in childhood compared to adult glioma.

High grade gliomas are aggressive brain tumours that affect patients of all ages. A team led by Dr Chris Jones within the ICR's Section of Paediatric Oncology is studying the genetics of gliomas that arise in children, in order to understand the differences between the adult and paediatric diseases. They recently discovered some paediatric tumours contain abnormalities in two genes, *EGFR* and *PDGFRA*, and inhibiting both simultaneously killed these cancer cells. Drugs such as erlotinib (Tarceva) and imatinib (Glivec), which are already in the clinic to treat the adult disease, are directed against the proteins encoded by these genes. It is hoped that such targeted combinations can quickly be applied to benefit children with high grade gliomas.

“Unravelling which combinations of new targeted therapies will work best in each tumour type is a major challenge for paediatric oncology”

Dr Chris Jones



Expanded Potential for PARP Inhibitors

Professor Alan Ashworth FRS FMedSci

Professor of Molecular Biology, Director of the Breakthrough Toby Robins Breast Cancer Research Centre & Co-Director of Research Integration at the ICR & The Royal Marsden NHS Foundation Trust.

“Clinical trials have already shown the potential of PARP inhibitors for patients with tumours caused by faulty *BRCA* genes. We now need to test whether these very promising results can be matched in the much larger group of patients with *PTEN*-related tumours.”

Professor Alan Ashworth

Poly(ADP-ribose) polymerase (PARP) inhibitors, which block the activity of the PARP enzyme, are currently showing considerable promise in clinical trials for certain types of inherited breast and ovarian cancers. Now scientists at the ICR have shown that these drugs might be applicable to a much wider range of breast, prostate, womb, bowel and skin cancers.

PARP inhibitors have been developed to treat cancers arising in patients with mutations in the *BRCA1* or *BRCA2* genes. In normal cells, blocking PARP has little consequence, as its functions in DNA repair are rescued by the *BRCA1* and *BRCA2* proteins. However, inhibiting the activity of PARP in cancer cells with *BRCA* mutations leads to these cancer cells being unable to repair their damaged DNA. This is because these patients have a defect in a specific DNA repair pathway called homologous recombination. PARP inhibitors attack this Achilles' heel, resulting in a potentially highly selective therapy. Clinical trials performed at the ICR, and elsewhere, have shown that these drugs can have considerable anti-tumour effects in patients while having much reduced side effects compared to conventional chemotherapy.

Faults in the gene called *PTEN*, which regulates cell division, are common in a range of cancers, including a significant fraction of breast, prostate, lung, melanoma, colon and womb cancers. Scientists at the ICR have shown that cells lacking a functional *PTEN* gene can be at least 25-times more sensitive to PARP inhibitors than cells with normal *PTEN*. This means that the patient group that might benefit from PARP inhibitors could be expanded from the important, but relatively rare, group of *BRCA1* and *BRCA2* carriers, to a much more common population. The next step will be to test these observations in clinical trials.

1980

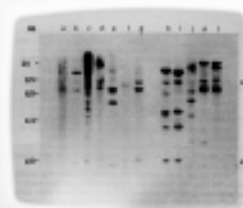
Professor Robin Weiss FRS becomes Director of the ICR. During the 1980s, he heads research into the human immunodeficiency virus (HIV) and develops the first antibody tests for screening blood donors and patients infected with HIV

1980s

Professors Ann Jackman and Ken Harrap develop raltitrexed (Tomudex). In 1996, AstraZeneca Pharmaceuticals registers the drug for clinical use – the first successful drug for the treatment of colorectal cancer in 35 years

1983

Researchers led by Professors Chris Marshall FRS and Alan Hall FRS discover *N-RAS*, a human cancer transforming gene (oncogene). Professor Marshall goes on to elucidate the mechanism by which the oncogene *RAS* turns normal cells into tumour cells



Olaparib: Promising Results in BRCA 1/2 Mutation Carriers

Professor Stan Kaye MD FRCP FRCR FRSE FMedSci

Cancer Research UK Professor of Medical Oncology, Chairman of the Section of Medicine at the ICR & Head of the Drug Development Unit at The Royal Marsden NHS Foundation Trust.

“The recent discovery of the strong therapeutic benefit of so-called PARP inhibitors, when used on tumours with defects in one type of DNA repair pathway, provides a proof of principle for organizing a major new attack on cancer.”

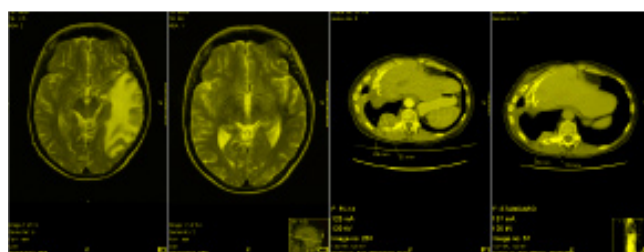
Bruce Alberts, Editor-in-Chief of Science

(Alberts B. Redefining cancer research. Science 2009; **325**: 1319).

Four years ago, Professor Alan Ashworth's Team showed that cancer cells with mutations in the *BRCA* gene were exquisitely sensitive to a new form of cancer treatment – called synthetic lethality. They used a drug called a poly(ADP-ribose) polymerase (PARP) inhibitor which takes advantage of the specific deficiency in certain DNA repair pathways present in these cells; the question then was – would this treatment actually work in the clinic in patients with *BRCA* mutation-associated cancers, particularly those with ovarian and breast cancer?

This year, the Drug Development Unit reported the first clinical trial of a PARP inhibitor (called olaparib), which directly answers this question, and the results were remarkably positive. They found that olaparib was a well-tolerated oral treatment with few of the typical side effects of chemotherapy. In 12 of 19 patients with *BRCA*-associated cancer, significant clinical benefit was seen. This has been confirmed in a larger series of 50 patients with *BRCA*-associated ovarian cancer treated in the Unit. *BRCA*-associated ovarian cancer, which is inherited and is linked to *BRCA*-associated breast cancer, comprises a minority

of cases (about 15%), but there is a sound rationale for believing that a much larger proportion of patients with ovarian cancer may benefit from this treatment. The Unit is hard at work in the clinic further assessing the remarkable potential of PARP inhibitor treatment (see Figure) while Professor Alan Ashworth continues to explore new directions for tumour-specific synthetic lethality.



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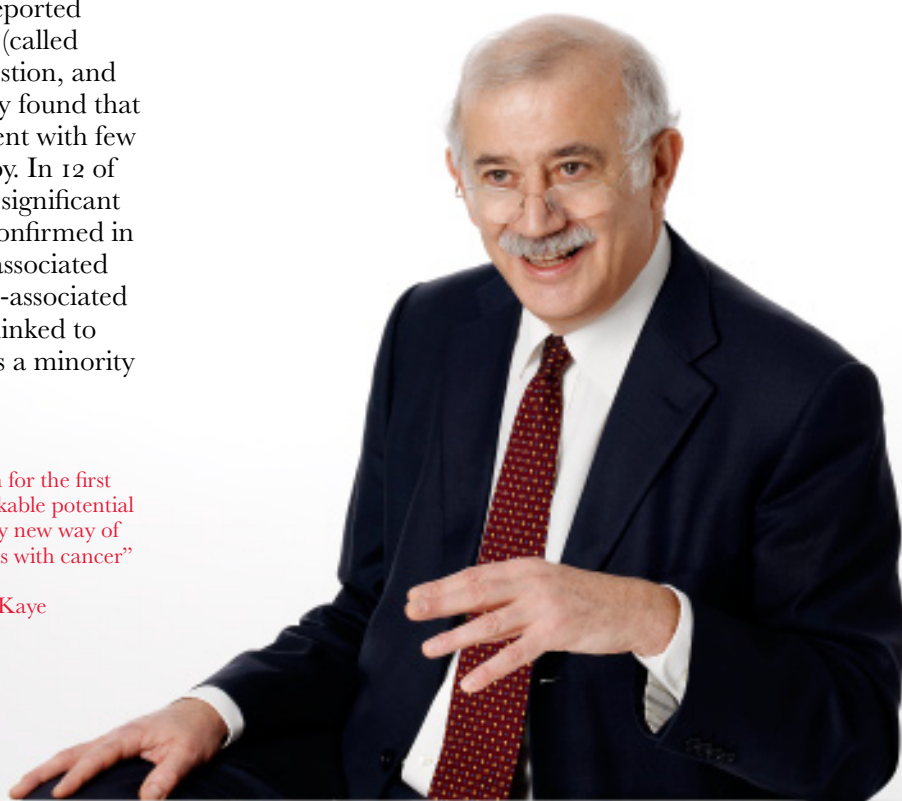
Response in brain and pleural cavity after 6 weeks of treatment with olaparib in patient with *BRCA* negative sporadic cancer.

1989

Professor Peter Garland becomes Chief Executive (Director) of the ICR

“We have shown for the first time the remarkable potential for a completely new way of treating patients with cancer”

Professor Stan Kaye



Drugging the Cancer Genome – Working in Partnership for Patient Benefit

Professor Paul Workman PhD DSc(Hons) FSB FMedSci

Harrap Professor of Pharmacology & Therapeutics, Director of the Cancer Research UK Centre for Cancer Therapeutics & Chairman of the Section of Cancer Therapeutics at the ICR.

The Centre for Cancer Therapeutics has been very successful in discovering new drugs that target specific molecular defects in cancer, an approach that we describe as ‘drugging the cancer genome’. Following our initial discoveries, we regularly partner our projects with Biotechnology and Pharmaceutical companies to get our exciting new drugs to the clinic faster.

Over the last five years, we have, with our collaborative partners, discovered 14 new drug candidates. These are selected for further studies in preparation for clinical trials in cancer patients.

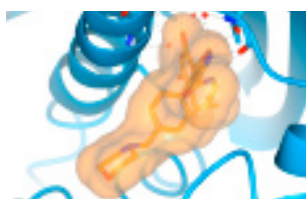
Of special note this year, five drugs discovered in the Centre, either independently or with partners, are currently in early clinical trials in the Drug Development Unit of The Royal Marsden:

- Abiraterone (Johnson & Johnson), which has shown promising results in the treatment of prostate cancer, is now being investigated in breast cancer
- GDC-0941 (Genentech), which inhibits PI3 kinase – an important enzyme needed for the growth and spread of many cancers
- NVP-AUY922 (Novartis), a heat shock protein (HSP)90 inhibitor. HSP90 is a ‘molecular chaperone’, which is involved in the folding and activity of cancer-causing proteins
- CHR-3996 (Chroma Therapeutics), a drug which inhibits the class I histone deacetylase enzyme and halts cancer cell growth

- ONYX 0801 (Onyx), an alpha-folate receptor targeted agent that preferentially acts on tumour cells and prevents their replication

Recently, AstraZeneca selected a clinical candidate from the Protein Kinase B (PKB) inhibitor collaboration between Astex Therapeutics and both the Cancer Therapeutics and Structural Biology sections at the ICR. PKB is a key enzyme involved in tumour cell growth and survival and is one of the most exciting new molecular targets for cancer treatment. All our drugs are developed with the help of molecular biomarkers, which are used to show that drugs act as intended and to identify the most responsive patients.

The Centre has embarked on two new exciting earlier stage collaborations in this last year. Building on success with HSP90, we have initiated a collaboration with AstraZeneca to advance our work on a new approach to exploit the dependence of cancer cells on chaperone and stress pathways. The ICR and the University of Cardiff have also formed an alliance with Merck Serono to accelerate our discoveries of inhibitors of the WNT signalling pathway. The WNT pathway is hijacked in many cancers to support their growth. Hence inhibitors of the WNT pathway have great potential.



X-ray crystal structure of the drug NVP-AUY922 bound to the active site of its target – the molecular chaperone HSP90.

1990s

Studies on childhood leukaemia in identical twins show that the gene mutation that leads to the disease occur in the womb; a further postnatal event triggers the disease. In 2008, Professor Mel Greaves and colleagues identify critical stem cells that initiate and drive childhood leukaemia – these cells will provide a target for new therapies



1991

The ICR (together with The Royal Marsden and the Johnson-Matthey company) receive the Queen's Award for Technological Achievement for the development of platinum-based anticancer drugs



Abiraterone Continues to Show Promise in Aggressive Prostate Cancers

Dr Johann de Bono MD PhD FRCP

Reader in Experimental Cancer Medicine in the Section of Medicine at the ICR, Honorary Consultant & Team Leader of the Prostate Cancer Team in the Drug Development Unit at The Royal Marsden NHS Foundation Trust.

Abiraterone, a drug discovered at the ICR, is undergoing clinical testing for use in advanced, aggressive prostate cancer. For the majority of men, prostate cancer is not life-threatening; however, about 10,000 men die of the aggressive form of the disease each year.

An initial Phase I clinical trial in 21 patients with the aggressive form of prostate cancer showed promising results – two-thirds of men experienced a decrease in tumour size and fall in levels of PSA (a protein associated with prostate cancer activity).

The subsequent Phase I/II trial in 54 patients has confirmed these exciting results. During the trial, ICR researchers also worked out how to combat drug resistance and how to identify those who will benefit the most from abiraterone treatment. When abiraterone stopped working, adding a steroid treatment reversed drug resistance, and the response to treatment was extended by another 12 months. Interestingly, many of the patients who had very significant shrinkage of their tumours had a genetic alteration called *TMPRSS2/ERG*. The study's researchers have now developed a test for this to detect the men who will most likely gain from abiraterone therapy. Chief Investigator Dr Johann de Bono said: "The more we learn about how this drug works, the more we will be able to find further ways of counteracting a patient's potential genetic resistance to it."

Abiraterone is currently in Phase III trials in patients with prostate cancer at more than 150 hospitals across the world. If the trials continue to show a benefit, it is hoped that abiraterone may be available for general use as a prostate cancer treatment by 2011.

"Two years ago, I was in severe pain as my prostate cancer had spread to my bones. I was involved in the earlier trials and received the additional steroid treatment to combat resistance. This drug has given me over two years of life, symptom-free. I have been able to go back to fully enjoying my retirement and travelling with my wife to places such as India."

Mr Michael Torr, a patient who took part in the Phase II abiraterone clinical trial

"These new results are extremely promising. Almost all these men had cancer that had spread to the bones, lymph glands and elsewhere. Many were in pain and not enjoying life. The patients involved in the Phase I/II trial remained pain-free for an average of about eight months, a brilliant result for those with aggressive prostate cancer and their families"

Dr Johann de Bono



The Breakthrough Generations Study

Professor Anthony Swerdlow PhD DM DSc FFPH, FRCPG FSB FMedSci

Chairman of the Section of Epidemiology (including the Department of Health Cancer Screening Evaluation Unit) at the ICR.

“When I found out about the Breakthrough Generations Study I knew that it was important for me to join. If the 100,000 women taking part can help scientists find the causes of breast cancer, it will be a wonderful achievement by all of us.”

Sarah Brown

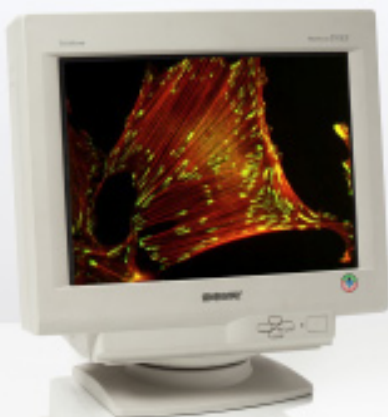


Two Breakthrough Generations Study participants, Amanda Jones and Charlie Wright, meet Sarah Brown at Number 10 to explain why they joined the study.

Sarah Brown, the Prime Minister's wife, has joined the Breakthrough Generations Study as the number of participants in the study, from all over the UK, passed 100,000. This is a unique study into the causes of breast cancer, and will collect information about the influence of lifestyle, environmental, genetic and hormonal factors on the women enrolled over the next 40 years. The study is being conducted by epidemiologists, geneticists and laboratory scientists in the ICR's Section of Epidemiology and the Breakthrough Centre, and is collecting questionnaire information and blood samples from the women who join.

“When I lost my daughter to breast cancer I wanted to do everything I could to help further research into this disease. It is tremendous to think that by joining the Breakthrough Generations Study I could help scientists discover more about the causes of breast cancer.”

Amanda Jones, a participant in the Breakthrough Generations Study



1992

Led by Professor Alan Hall FRS, scientists at the ICR discover that the molecular mechanism for the motility behaviour of animal cells (cell to cell attachment and cell movement) is through control of cytoskeletal assembly by specific GTPase-proteins, known as Rho and Rac

1993

Professor Peter Garland secures Higher Education Funding Council for England funding for the ICR



1995

The Royal Society elects Professor Chris Marshall to its Fellowship and, subsequently, Professors Mel Greaves (2003); David Barford (2006); and Alan Ashworth, Laurence Pearl and Michael Stratton (2008)



Determining the Optimum Age for Cervical Screening

Dr Roger Blanks PhD

Senior Staff Epidemiologist in the Department of Health Cancer Screening Evaluation Unit, Section of Epidemiology at the ICR.

“The Cancer Screening Evaluation Unit started in 1988 and has conducted research both nationally and internationally into the effectiveness of population screening, improving the scope and efficiency of national screening programmes, such as those for breast, cervical and bowel cancer. The work of the Unit has had a major impact on the decisions to start screening programmes and improve the efficiency of existing programmes.”

Dr Roger Blanks

“The cervical screening programme in England is a great success, it is internationally recognised as world class and saves up to 4500 lives every year. We welcome this new research that shows our policy of continuing to screen women up to age 64 is correct and contributes to the number of lives saved.”

Ann Keen, Health Minister

Cervical cancer is the second most common cancer in women under 35 years old, with approximately 2700 women diagnosed each year in the UK. In England, women now receive their first invitation for cervical screening at 25 years old and screening continues up to 64 years. A new study, led by Dr Roger Blanks, examined whether women with a negative smear history before the age of 50 are unlikely to develop cervical cancer once over 50 years of age. It was found that the risk, while decreasing, was still present, and suggests that the current policy on inviting these women is appropriate. Over the last 20 years, the research conducted by the Unit has successfully improved screening programmes.

1995

Led by Professors Michael Stratton and Alan Ashworth, an international study identifies and sequences the *BRCA2* breast cancer gene. This enables families with a history of the disease to be assessed for future risk, and leads to the development of *BRCA*-associated cancer therapy

“Cancer screening has both benefits and harms and a role of the Cancer Screening Evaluation Unit is to conduct research to help maximise the benefit of screening to people who would otherwise die of the cancer being screened for, and to minimise the harm of screening to all others”

Dr Roger Blanks



Mapping Cancer Networks

Dr Chris Bakal PhD

Team Leader of the Dynamical Cell Systems Team in the Section of Cell and Molecular Biology at the ICR.

“To understand cancer, you have to understand cancer networks. The initiative in network biology represents another phase in the long-standing tradition of the ICR to implement and develop cutting-edge tools in cancer research.”

Dr Chris Bakal

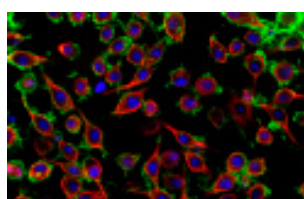
Just like the London Underground, biochemical reactions in a cell are organised into complex networks. Mutations that cause cancer re-route the flow of information in these networks. This can result in the formation of tumours, and metastasis, where cancer cells move from one part of the body to another. Understanding these complex pathways is one of the major challenges in cancer research.

The ICR has established an initiative in network biology, which is a collaborative effort between laboratories within the ICR. The initiative has the shared goal of mapping cancer networks and to ultimately identify points of vulnerability in these networks that, when blocked, will shut down cancer progression.

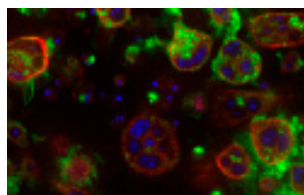
The initiative will combine technologies for mapping networks and has recently received major investment for state-of-the-art microscopes, mass-spectrometers to determine protein interaction networks, and an advanced supercomputer to process the information generated.

Dr Chris Bakal and his Team are one of the groups involved in the initiative. They aim to inhibit one gene at a time in cancer cells, in order to identify

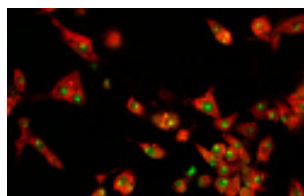
which genes control the cellular shape alterations required for tumour cells to metastasise. Dr Bakal explains: “I am interested in how cells coordinate shape changes due to alterations in numerous cellular processes. I am particularly interested in a family of proteins call Rho-family GTPases which coordinate the activity of key cellular processes. By studying how these proteins operate as part of cancer networks, we hope to develop therapies that are more effective against cancer, and less toxic to patients. The aim of the initiative is to be able to use maps of cancer networks to better predict cancer outcomes and devise personalised treatments based on a patient’s unique genetic identity.” Some of the interesting work of Dr Bakal’s Team is illustrated in the images below.



Normal fruit fly cells stained with fluorescent dyes.



Cells from the fruit fly that have failed to undergo cell division due to a specific gene (*Rho1*) being inhibited.



Normal fruit fly cells stained with alternative fluorescent dyes showing small molecules that have been implicated in the development of cancer and the aging process.

1997

Launch of the ICR’s Everyman Campaign to raise money for research into male cancers

1999

The Breakthrough Tony Robins Breast Cancer Research Centre at the ICR’s Chester Beatty Laboratory is opened by HRH The Prince of Wales

Professor Peter Rigby becomes Chief Executive of the ICR



The Centre for Molecular Pathology

Dr Jorge S Reis-Filho MD PhD FRCPath¹ & Professor Alan Ashworth FRS FMedSci²

¹Team Leader, Molecular Pathology Laboratory, the Breakthrough Toby Robins Breast Cancer Research Centre at the ICR.

²Professor of Molecular Biology, Director of the Breakthrough Toby Robins Breast Cancer Research Centre & Co-Director of Research Integration at the ICR & The Royal Marsden NHS Foundation Trust.

Cancers affecting a specific site are not single diseases, but rather a collection of diseases caused by alterations of distinct genes and molecular networks. Technological developments in the last decade have led to an increase in our understanding of which of these are required for cancer cells to grow and survive. Because of our increased knowledge of these molecular mechanisms, scientists at the ICR are now able to work on developing a new generation of cancer drugs targeted to the genetic abnormalities found in cancer. Thus, the availability of a comprehensive and systematic characterisation of the molecular features of cancers has become the linchpin of personalised medicine. As healthcare costs spiral, the need to identify patients most likely to benefit from specific treatments is increasingly urgent.

As a consequence of these factors, the ICR and The Royal Marsden (led by Professor David Cunningham) are jointly developing the Centre for Molecular Pathology. The Centre will provide state-of-the-art facilities and bring together world experts in molecular pathology, bioinformatics, translational research (where scientific discoveries are transformed into practical applications) and fundamental science to speed up the process of introducing personalised medicine in daily patient care. A major aim is to establish new and reliable molecular diagnostics and biomarkers to enable the personalisation of cancer treatments, to develop measurements that indicate disease state, to drive the clinical development of novel anticancer drugs, and to identify new molecular targets in a range of tumour types using advanced molecular profiling technologies.

The Centre will strengthen the ICR's already considerable position as a leading institution in the development of personalised medicine for cancer. The information obtained will be used to optimise the clinical benefit provided by new cancer therapies in order to improve patient outcome.

2000

The Everyman Keep Your Eye on the Ball campaign launches

The Male Urological Cancer Research Centre opens at the Sutton campus, which incorporates the Bob Champion Research Centre for Urological Cancer and The Everyman Centre

“Understanding the heterogeneity of cancer and the molecular drivers of specific cancer subtypes holds the key for the development of individualised medicine”

Dr Jorge Reis-Filho



Academic Dean's Report

Professor Alan Horwich PhD MRCP FRCR FMedSci

Academic Dean, Head of Clinical Laboratories & Chairman of the Section of Academic Radiotherapy at the ICR & Honorary Consultant in Clinical Oncology at The Royal Marsden NHS Foundation Trust.

The ICR has had another successful calendar of academic events and achievements. In particular, we congratulate our appointed Professors and Readers, graduating research students, and the Interactive Education Unit for receiving the 'Pfizer's Excellence in Oncology Award' for the 'Breaking Barriers' education initiative.

Academic Titles

The achievements of our senior scientists and clinicians continue to be recognised by the conferment of academic titles of the University of London. Pascal Meier became a Professor of Molecular Cell Biology, Peter O'Hare became Professor of Cell Biology and Johann de Bono became Reader in Experimental Cancer Medicine.

Award Ceremony

The 2009 Award Ceremony was held in November at the University of London.

Eighty-seven graduates received their University of London degrees; 24 gained the Doctor of Philosophy (PhD), nine received the Doctor of Medicine (MD), four the MD(Res), 11 received a Master of Science (MSc), and Postgraduate Diplomas and Certificates in Oncology were awarded to eight and 12 students, respectively. The Chairman's Prize for the two outstanding graduating PhD students was awarded

to Dualta McQuaid and Paulo Ribeiro.

Each year, individuals are made Fellows or Members of The Institute in recognition for their major contributions to the advancement of the ICR's objectives. In 2009, the honorary appointment of Fellow of The Institute was conferred upon Mr Edward Cottrell, who was Honorary Treasurer of the ICR from 2000 to 2008. Professor Adrian Harris, Mrs Isabelle Hotimsky, Konstantin Graf von Schweinitz and Dr Keith Snell were appointed Members of The Institute.

This year, five honorary degrees were conferred. Professor Alan Hall MA PhD FRS FMedSci was at the ICR from 1981 to 1993 and did much to bring about the molecular biology revolution that was essential for the ICR's scientific development at the time. He was conferred for his pioneering contributions to cell biology research and its application to the study of cell motility in cancer progression. Professor Jacques Miller MB PhD DSc FAA FRS, who was at the ICR from 1958 to 1966, was conferred for having discovered the immunological function of the thymus, and for his identifying of the T and B cell subsets of lymphocytes and determining their function. Professor Robert Souhami CBE MD FRCP FRCR FMedSci was conferred for his outstanding services to the training and practice of Medical Oncology. Sir Kenneth Stowe MA GCB CVO was an ICR Trustee and Chairman between 1987 and 1997 and is the first non-scientist to be honoured by the award. He was conferred for his incomparable service to healthcare and medical research, and in particular to the furtherance of cancer research. Professor Ian Tannock MD PhD

2000

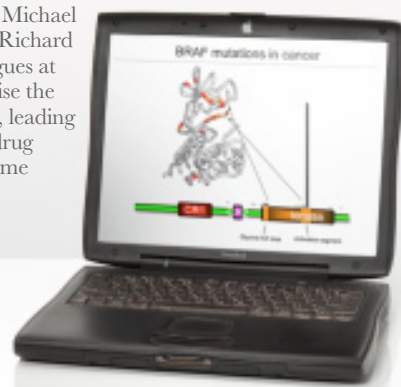
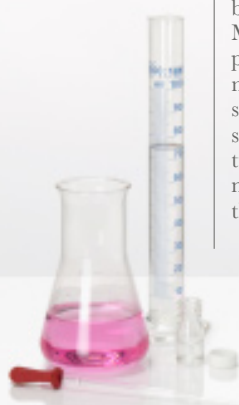
The Cancer Genome Project begins – headed by Professor Michael Stratton FRS, the programme will screen the normal human genome sequence against the genome sequences of all common tumours to identify where mutated genes occur in those tumours

2001

Since 2001, the ICR has been involved in the formation of six spin-out companies: London Genetics, Pettra, PIRamed, Domainex, Chroma Therapeutics and Proacta

2002

In the first major outcome of the Cancer Genome Project, Professors Michael Stratton FRS and Richard Marais and colleagues at the ICR characterise the *BRAF* cancer gene, leading to an accelerated drug discovery programme





Dr Duncan Gilbert (who received his PhD at the 2009 Award Ceremony), Professor Alan Horwich and Dr Robert Huddart



Catherine Dunbar and Fiona Veira-McTiernan receive the prize on behalf of the Interactive Education Unit

FRCPC, who undertook a PhD at the ICR in 1965, was conferred for his distinguished and influential contributions to translational and clinical research and its application to patient-centred oncology practice.

Link Lectures

Every year, the ICR holds a 'Link Lecture' with The Royal Marsden, in addition to a series of distinguished lectures, for which the ICR invites external speakers to discuss their current work.

In March 2009, the Sixteenth Annual Link Lecture was given by Professor Kevan Shokat, a leading investigator in the new field of chemical genetics from the University of California, San Francisco, USA. The lecture 'Chemical genetic analysis of protein kinase signalling cascades' provided an overview of synthesising small molecules that are specific for a particular target in cell signalling.

The Interactive Education Unit Honoured in the 'Pfizer Excellence in Oncology Awards'

A programme to improve cancer pain management has won the ICR, in collaboration with The Royal Marsden, recognition for the Best Professional Education Initiative at this year's 'Pfizer Excellence in Oncology Awards'.

The educational CD ROM 'Breaking Barriers', developed by Catherine Dunbar and her team in the ICR's Interactive Education Unit, aims to teach healthcare professionals about the latest advances in pain management for cancer patients. The programme has already been distributed to almost

2000 clinicians worldwide. The prize's judges noted: "This educational programme is excellent, an outstanding initiative that deserves to be recognised. Due to the success and quality of delivery, it has the potential for national roll out."

"I was delighted and honoured to receive the award, which is testament to all the hard work of our team. Whilst the ICR is best known for its scientific advances in the fight against cancer, this is one of the many initiatives we run that help to educate professionals with the ultimate aim to provide cancer patients with high quality care and treatment"

Catherine Dunbar



In the News

Treatment for Injured Footballers Could Help Cancer Patients

More than 500 media outlets publicised the start of a new trial of hyperbaric oxygen treatment. The trial includes patients who suffer long-term gastrointestinal problems from receiving radiotherapy for cancer in the pelvic region. Hyperbaric oxygen treatment is commonly used to treat 'the bends' in divers and to speed up the injury healing time in elite footballers. Major daily papers including The Independent, Daily Mirror, Daily Express and Daily Star, along with the Guardian online and BBC News, and hundreds of regional papers and health publications, covered the story. Joint trial leader Professor John Yarnold also participated in interviews with several radio stations around the country.



New Drug Targeting Cancer Weakness Shows Great Promise

Olaparib made news worldwide when early trial results were published in the *New England Journal of Medicine* in June. The peer-reviewed journal announced it made the unusual decision to publish results of such a small trial because it "not only reports important results, it also points to a new direction in the development of anticancer drugs". In the UK, BBC News, Sky News, and ITN televised the story and the Daily Mail, Financial Times and The Independent all published it. The trial results also received world-wide attention, with NBC announcing that the research was "the most exciting development in cancer research in a decade or more."

2003

HRH The Princess Royal opens the Brookes Lawley Building at the Sutton campus

The ICR becomes an independent College of the University of London

2004

Launch of The Breakthrough Generations Study – combining research in cancer genetics with epidemiology to map how environmental and lifestyle factors interact with an individual's genetic makeup to influence the risk of developing breast cancer





Any Questions? Panel and ICR staff. Left to right: Rt Hon Theresa May, Sadiq Khan MP, Jonathan Kipling, Professor Peter Rigby, Baroness Jane Bonham-Carter and Nick Cohen

Scientists Solve 100-year Cancer Puzzle

Almost all the major British newspapers reported on Professor Mel Greaves' investigation into a rare case of a mother and her infant daughter developing the exact same cancer. The team used a technique called genetic fingerprinting to confirm the cancer cells in the child had come from the mother by crossing the placenta. Further investigation revealed a fault in the child's immune system that meant it had failed to recognise and destroy the invasive cells. The Guardian dedicated its whole third page to the story, and it also received significant coverage in a number of national newspapers. The study, published in *Proceedings of the National Academy of Sciences* journal, received extensive airtime on BBC radio, as well as on BBC World television and Sky News. Coverage also reached Asia, and North and South America.

'Any Questions?' hosted by ICR

In March, the ICR hosted Radio 4's prestigious *Any Questions?* programme in Sutton. A sold out crowd of staff, students, local political representatives, members of the community and friends attended to watch Jonathan Dimbleby, Chair, debate with panellists. The panel consisted of: Sadiq Khan (Labour Member of Parliament: Communities Cohesion Minister, Department of Communities and Local Government); Rt Hon Theresa May (Conservative Member of Parliament: Shadow Secretary of State for Work and Pensions); Baroness Jane Bonham-Carter (Liberal Democrats' spokesperson for Culture, Media and Sport); and Nick Cohen (Columnist for The Observer and author). An interesting and lively discussion was enjoyed by all.

2005

Led by Professor Alan Ashworth FRS, ICR scientists show that cells with faulty *BRCA* genes are highly sensitive to PARP-inhibitors. Phase I trials were held in 2006/2007 and Phase II trials are investigating benefits in *BRCA*-associated breast or ovarian cancer



2006

The Department of Health selects The Royal Marsden and the ICR to be a Biomedical Research Centre – it is the only one specialising in cancer

The ICR awards its first Honorary Degree to Professor Karen Vousden, Director of Cancer Research UK's Beatson Institute for Cancer Research



Public Support

We are extremely grateful for the generous support we receive from the public. Their help allows the ICR to continue its groundbreaking research. Whether it's by leaving a legacy to support our work, making personal donations, attending our fundraising events or organising their own events, the effort and dedication of our supporters is greatly appreciated.

Legacies

Over half our voluntary income comes from legacies, which this year successfully raised £4.3 million.

Our increasingly important 'Will for Free' scheme has helped us to weather the current economic storm. The 'Will for Free' scheme offers people aged 50 and over the opportunity to make or update a basic will for free. It is done in the hope that once they have provided for their family and friends, they might consider leaving a gift to the ICR in their will. In total, 'Will for Free' has raised over £50 million in pledged income since 2002. This year was our most successful to date. A total of £900,000 of the total legacy income came from the 'Will for Free' scheme and we have secured a further £10.6 million in pledged income – almost a 50% increase on 2007.

Trusts & Foundations

We are indebted to the continued generous support of a number of Trusts and Foundations. Among our

generous supporters, we would like to mention the following:

The Freemasons' Grand Charity made the sixth instalment of its 10-year pledge towards the Grand Charity of Freemasons' Chair of Molecular Biology, held by Professor Colin Cooper. The Rosetrees Trust is also supporting a project under Professor Cooper, and extends its interest to Professor Nazneen Rahman's childhood tumour study.

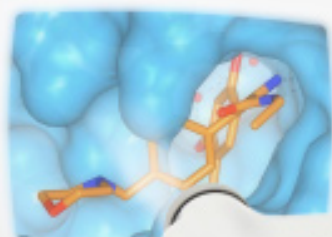
The Thornton Foundation has supported Dr Kevin Harrington's research into head and neck cancers. Professor Caroline Springer's gene and antibody-directed therapy has been supported by the Lewis Family Charitable Trust.

The Isle of Man Anti-Cancer Association also remains a dedicated supporter and has pledged full funding towards an ICR studentship this year, as well as donating gifts towards skin cancer research under Professor Richard Marais and to the Everyman campaign.

Events & Challenges

In addition to the special Centenary Fundraising Events, our hard-working supporters have been taking on their own fundraising challenges or attending fundraising events.

Our running events portfolio has continued to grow with the addition of the Royal Parks half marathon. Participants this year have tended to favour our UK running events, such as the London Marathon and the Great North Run, rather than those overseas.



2007

Professor Paul Workman and colleagues publish the discovery of a HSP90 inhibitor as a new anticancer drug, which enters clinical trials in the same year. In 2008, they knock out two genes in the HSP70 family, which inactivates HSP90 and at the same time, kills off cancer cells but not normal cells, suggesting a new approach for drug discovery



Runners raising money for the ICR and Everyman campaign



Guests and choristers at the ICR's Carol Service

Increasing options for UK supporters, therefore, continues to be a major priority for the Sports Team.

However, we have also seen an increase in supporters wishing to take on one of our many overseas challenges. Whether it's taking part in the London to Paris cycle ride or climbing Kilimanjaro in Tanzania, these intrepid adventurers raised over £120,000 in sponsorship this year.

Carols From Chelsea

The ICR's Carol Service is held each year in the chapel at the Royal Hospital, Chelsea; home of the Chelsea pensioners. In our centenary year, we were honoured by the presence of HRH The Duke of Kent – others taking part included John Standing, Joanna Trollope, Nyasha Hatendi, the BBC Young Choristers of the Year Jacqueline Hill and Laurence Kilsby, the viola player Norbert Blume and Claire Jones, Official Harpist to The Prince of Wales. Raising over £100,000 this year, the Carols From Chelsea event has made a significant contribution to our research into cancer drugs and children's cancers.

Supporter Highlights

In May 2009, three supporters set off on one of the toughest solo ocean challenges in the world, OSTAR, raising thousands of pounds.

Graeme Chapman and the Climb of Life team continue their support through their mountain challenge in the Lake District, which annually raises over £60,000.

Karen and Kevin Capel, who lost their beloved son to a medulloblastoma brain tumour only last year, set up the 'Christopher's Smile' appeal, and have raised over £34,000.



2008

Darren Couchman's Testicle Tour starts with the aim of raising awareness of testicular cancer. Darren and his friend Richard Miller visit 66 locations throughout England that have some kind of reference to the male genitalia

On Friday 7 November 2008, Chairman of company 'Office Friendly', Graeme Chapman MBE, took colleagues, family and friends, plus two staff members from the ICR back up into the mountains of the Lake District to raise money for the ICR



Everyman – Funding Research to Stamp Out Male Cancer



The ICR's Everyman campaign aims to raise awareness of male cancer and provide funding for prostate and testicular cancer research. This year, we are pleased to announce our new look, logo and refreshed website.

Everyman Month & Turn Blue

Everyman Month 2009 was launched with survey findings revealing that 30 per cent of British men subscribe to an 'I'll be fine' attitude about their health which prevented them from seeing a doctor or seeking medical advice. The survey results were covered extensively in the media. One of Everyman's patrons, Jason Cundy (TalkSPORT host and ex-Premiership footballer), was interviewed by GMTV and other media outlets to promote Everyman Month, and to get men thinking more seriously about their health. Long-time patron, Dermot O'Leary and British comic, Ricky Gervais, also urged men to get involved. Ricky said: "Everyone can do something to eradicate prostate cancer. Come on; pull your finger out – unless you are a qualified doctor – in which case you know what to do!"

The Greater London Authority helped highlight Everyman's first ever 'Turn Blue Day' by lighting Trafalgar Square's fountains blue in June. London Mayor, Boris Johnson, said: "This is a very important campaign. One of the best defences against cancer is being aware and taking care – so don't be embarrassed chaps – look after yourselves and check for those tell tale signs."

Corporate Support

Over the last year, our corporate supporters have continued to play a key role in providing support for the Everyman Campaign. Not only do they help raise vital funds for the research but also help build awareness of the campaign as a whole.

A number of new partners are supporting Everyman this year. Screwfix chose Everyman as their Charity of the Year and are looking to raise in excess of £50,000 through employee fundraising and cause related marketing products including t-shirts and beanie hats. Papa John's designed an Everyman pizza (meatballs, onions and red & green pepper toppings!) making a 50p donation from each pizza sold. Moss Bros and Top Golf raised funds through a cause related marketing campaign and a bespoke Everyman game package, respectively. Debenhams sold our ever popular pin badges in-store and Palletways maintained their support for Everyman as their main charity recipient. In addition, IMS Health, who are now in the second of their three year partnership with the ICR, donated a generous £20,000.



2008

Mary Falk who raised over £85,000 for the ICR from her boat races, is presented an outstanding achievement award at the ICR's annual Thank You Event, in recognition of her bravery and determination

2008

In a childhood cancer study, Professor Nazneen Rahman discovers diverse genetic and epigenetic mutations on chromosome 11 that cause 5% of cases of a childhood kidney cancer (Wilms tumour). Her team also optimised a diagnostic blood test for the abnormalities that is in use in the NHS





From left to right:

The new Everyman logo

Keith Lemon encouraging our TacheBackers

Trafalgar Square turns blue in June

KYEOTB Run participants

Fundraising Events & Donor Activities

The Everyman's Keep Your Eye On The Ball (KYEOTB) campaign is run in partnership with The Football Association and The Professional Footballers Association to raise awareness of male cancer within the football community.

This year KYEOTB was re-launched with a fresh new look and brand new website. A new partnership was also secured with Goals five-a-side centres, which launched our first KYEOTB football tournament in 2009. A viral advertisement with Teddy Sheringham, shown at football grounds across the UK during March, also enabled us to run our first ever SMS competition to win signed England shirts.

The football themed KYEOTB Run continued to grow this year, with a new 10K route added to the 5K run. Over 300 participants across 40 football clubs took part on the day and were joined by footballers Neil Harris of Millwall, Matt Duke of Hull City and Craig Easton of Swindon Town.

Tacheback, our annual event that encourages men to grow moustaches for a month, saw continued support from Remington in 2009. At the same time, Keith Lemon (comic creation of actor Leigh Francis) became the celebrity figurehead encouraging men to join him in "becoming a real man" and grow a "tache that raises cash" for Everyman.

Supporter Highlights

Darren Couchman and the Testicle Tour team continue to raise awareness with a march in the City of London with over 60 men carrying huge furry balls.

Jason Cundy led a star-studded team of aspiring footballers in the inaugural charity five-a-side football match for KYEOTB.

Jon Street & Catherine Breslin from the Everyman Team



Our Accounts – Year End 31 July 2009

Total income increased by £3.0 million (3.4%) compared with the previous year, excluding the one-off pension gain in 2008

Grant funding rose by £1 million and income from HEFCE increased by £2 million

The ICR continued to develop the diversification of income across sources

Fundraising and investment income fell in difficult economic conditions

Expenditure on research increased by £7.7 million (10.4%)



“Some 89% of the ICR’s activities are funded from competitively won peer-reviewed grants or through HEFCE’s measurement of excellence through the Research Assessment Exercise. The continuation of our research depends on our ability to win funds to do so”

Paul Norris, Director of Finance at the ICR

Income

	2009 £'000	2008 £'000
HEFCE	28,241	26,271
Charities	36,045	39,483
Research Councils	5,454	2,841
Government	6,544	5,398
Industry	1,968	1,128
Overseas & other	2,987	1,923
Legacies & donations	6,919	7,642
Investments	1,959	2,443
	90,117	87,129
One off non-cash gain on closure of ICR Pension Scheme	—	4,843
Total	90,117	91,972

Expenditure

	2009 £'000	2008 £'000
Research expenditure	81,729	74,003
Cost of generating funds	3,635	2,408
Information & education	1,014	858
Governance costs	554	493
Total	86,932	77,762

Notes

This information is intended to provide a summary of information contained in the Statement of Financial Activities of the ICR, which is part of the full annual accounts which have been audited.

The full annual accounts and the auditors' opinion on these accounts is available from 123 Old Brompton Road, London SW7 3RP.

2008

Phase I clinical trials with abiraterone, a drug discovered at the ICR, have demonstrated considerable promise in patients with hormone refractory prostate cancer



Working Together to Fight Cancer

The journey from basic research findings to the development of a new cancer treatment can be complex and costly. The ICR works together with a number of organisations to ensure efficient development of treatments for patient benefit. Some of the ICR's major funders and collaborators are shown here.

The ROYAL MARSDEN

NHS Foundation Trust

The ICR has extremely close academic and research links with The Royal Marsden, with many staff holding appointments in both institutions. This unique partnership forms Europe's largest Comprehensive Cancer Centre, which is one of the top four cancer centres in the world.



Cancer Research UK is the ICR's largest single research funder. The ICR is home to two major Cancer Research UK Centres; for Cell and Molecular Biology, and Cancer Therapeutics.



The ICR is home to the UK's first dedicated breast cancer research centre, 'The Breakthrough Toby Robins Breast Cancer Research Centre', housed in the Mary-Jean Mitchell Green Building in Chelsea.



As a UK higher education institution, the ICR receives about a quarter of its total recurrent income from HEFCE.



University of London

As a College of the University of London, the ICR has direct authority to run its academic affairs and the responsibility to maintain the highest academic standards. Most importantly, the ICR is able to appoint its own Professors, Readers and PhD student supervisors.

2008

The ICR is ranked the UK's top academic research centre by the Times Higher Education, in an authoritative interpretation of the 2008 Research Assessment Exercise (RAE). The RAE is the government's peer review analysis of research from UK universities





The ICR is currently in receipt of a grant (spread over 10 years) from the NCRI as one of only two NCRI Prostate Cancer Collaborative centres of research excellence. These collaboratives are co-funded by the Medical Research Council, the Department of Health and Cancer Research UK.



The ICR and The Royal Marsden receives funds from the National Institute for Health Research for the Biomedical Research Centre of Excellence. The Department of Health has also provided core funding to the Cancer Screening Evaluation Unit of the ICR for many years and finances certain epidemiological projects concerned with screening for various types of cancer. The current funding runs until the end of 2010.



The Medical Research Council is funded by the UK taxpayer and is independent in its choice of which research to support. The organisation is a significant funder of the ICR's work.



Funded primarily by the Wellcome Trust, the Sanger Institute is home to the Cancer Genome Project, initiated by Professor Mike Stratton FRS and Dr Richard Wooster from the ICR.



Leukaemia & Lymphoma Research funded teams at the ICR are delivering pioneering research into the cause of childhood leukaemia, genetic predisposition to leukaemia, molecular genetics of multiple myeloma and new treatments for blood cancers.



The Wellcome Trust Supports the Cancer Genome Project at the Sanger Institute and also funds three Drug Discovery programmes in addition to some of our basic molecular biology and genetic research. The Trust also has contributed funds towards the construction of the Brookes Lawley Building and has provided funding for four PhD studentships and two Clinical Fellowships per year at the ICR for a period of four years.

THE BOB CHAMPION CANCER TRUST



The ICR is home to the UK's first dedicated male cancer research centre, which was funded in partnership with the Bob Champion Cancer Trust.

The Public

The public raised just over £6.9 million for the ICR in the 2009 financial year through legacies and donations. This generous support helps us work towards our Mission: to relieve human suffering by pursuing excellence in the fight against cancer.

Acknowledgements

Grants & Funders

We would like to acknowledge and thank each of the following organisations who have awarded grants amounting to over £100,000 for our academic and research work over the past financial year (ending 31 July 2009):

Antisoma Research Limited
Breakthrough Breast Cancer
Breast Cancer Research Foundation
Cancer Research UK
Cridlan, Ross & Smith Charitable Trust
Department of Health
Engineering and Physical Sciences Research Council
European Commission
Genelux GmbH
Higher Education Funding Council for England
Kay Kendall Leukaemia Fund
Leukaemia & Lymphoma Research
Medical Research Council
Merck Serono
The Neuroblastoma Society
Prostate Cancer Charity
Prostate Cancer Research Foundation
The Royal Marsden NHS Foundation Trust
Samantha Dickson Brain Tumour Trust
The Wellcome Trust
Zeneca Pharmaceuticals

Philanthropic Support

The ICR would also like to thank all those who contribute to our work either through financial support or by donating their time and energy to the cause. In particular, we would like to acknowledge the following groups and individuals for their generous support over the past financial year (ending 31 July 2009):

Legacy Programme Supporters

The late Mr L Parsons
The late Ms Etherington
The late Ms P Tyler
The late Mr I Sutherland
The late Mr J Pickup
The late Mr J Harrison
The late Mr W Doble
The late Mr B Asher
The late Mr T Barnard
The late Ms G Bauer
The late Ms V Brockie
The late Ms E Sanglier

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 The late Mr R A Hambro
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 Mr Charlie Higson
 Mr and Mrs Marc Hotimsky
 Mr Jonathan Irby
 Mr Kenny Jackett
 Mrs T Johnson
 Mrs Annie Jordan
 Ms Linda Keyte
 Mr Malcolm Lane
 Mr David Lewis
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 Mr Teddy Sheringham
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 Mr Peter Walton
 Ms Zoë Wanamaker CBE
 Ms Amanda Whitlock
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 The Friends of The Institute
 Metropolitan Police – Flying Squad

Rotary Club of Settle
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 Tower Hamlets AC

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 Mr Robin Wilson & Ms Yana Alexandroff
 Mr John Zafiriou

Other Support

The ICR would also like to thank the following for kindly loaning their items for the Annual Review:
 The MRC Laboratory of Molecular Biology, Geoff Wood from the Hinton Sky Diving Centre and Professor Ken Harrap.

2009
 The Trafalgar Square
 fountain turns blue in June
 for the Everyman campaign



The ICR's Trustees

The Board of Trustees is the governing body of the ICR and is constituted under article 23 of the ICR's Articles of Association.

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Senior members of staff in attendance at Board of Trustees meetings:

Mr J M Kipling FCA DCha	Secretary of the ICR & Head of Corporate Services
Professor C J Marshall FRS FMedSci	Director of Research/Chairman of the Joint Research Committee

¹Senior member of the Board of Trustees

Jonathan and Marjorie Kipling, who met whilst working at the ICR. Marjorie worked as a PA to the Deputy Director and two Chief Executives for over 20 years. She is the longest serving employee and will have been at the ICR for nearly 47 years when she retires in May 2010. Jonathan, who was Secretary of the ICR and Head of Corporate Services for over 21 years, retired in December 2009, having worked at the ICR for nearly 33 years



The Institute of Cancer Research

123 Old Brompton Road
London SW7 3RP

Telephone: 020 7352 8133 Fax: 020 7370 5261
www.icr.ac.uk

Published by Academic Services. Edited by Liz Burtally. Designed by Radford Wallis. Printed in Great Britain by Breckland Print.

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2009

In our centenary year, our Annual Review reflects on the ICR's past history. Reassuringly, significant progress has been made in reducing mortality for a wide range of cancers. And over the century, the ICR is proud to be one of the leaders in making many of these advances

