

Annual Research Report 2000

for

The Institute of Cancer Research
Royal Cancer Hospital

University of London

and

The Royal Marsden NHS Trust

Postgraduate Teaching Hospital
of the National Health Service



AWARDED FOR
EXCELLENCE

Located at Chelsea, London and Sutton, Surrey

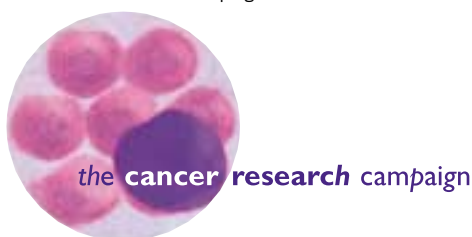
The review period covered by this Annual Research Report is 1 January – 31 December 2000

Copies of previous Research Reports and The Institute's Annual Report for 2000-2001 may be obtained from:
The Secretary, The Institute of Cancer Research, 123 Old Brompton Road, London SW7 3RP

Copies of the Annual Report for 2000-2001 of The Royal Marsden NHS Trust may be obtained from:
The Marketing Directorate, The Royal Marsden NHS Trust, Fulham Road, London SW3 6JJ

Major sponsors of the centres include:

The Cancer Research Campaign



Leukaemia Research Fund



Macmillan Cancer Relief



Breakthrough Breast Cancer



Abbreviations used in this Report:

The Institute	The Institute of Cancer Research	All The Institute staff names are printed in roman type
The Royal Marsden	The Royal Marsden NHS Trust	All The Royal Marsden staff names are printed in <i>italic type</i>
The Royal Marsden Trust Funds	Charitable Research Funds	

AICR	Association for International Cancer Research
BBSRC	Biotechnology and Biological Sciences Research Council
BTG	British Technology Group
CRC	The Cancer Research Campaign
CRCT	The Cancer Research Campaign Technology Limited
EMBO	European Molecular Biology Organisation
EORTC	European Organisation for Research into Treatment of Cancer
ESTRO	European Society for Therapeutic Radiology in Oncology
IARC	International Agency for Research on Cancer
ICRF	Imperial Cancer Research Fund
KKLF	Kay Kendall Leukaemia Fund
LOCR	Locally Organised Clinical Research
LRF	Leukaemia Research Fund
MRC	Medical Research Council
NIH	National Institutes of Health, US
UKCCCR	UK Co-ordinating Committee on Cancer Research

Chief Executives' Review of 2000

We are very pleased to present the Annual Research Report for The Royal Marsden NHS Trust and The Institute of Cancer Research which records a year of excellent progress with a number of highly significant achievements. Working together to promote excellence in cancer research, education, treatment and patient care has remained our key priority for 2000 and there are many success stories to celebrate. The Institute of Cancer Research and The Royal Marsden together comprise the largest comprehensive cancer centre in Europe and have an unrivalled national and international reputation. Together we have pioneered many new treatments which have become standard clinical practice world-wide and our joint enterprise is exceptional in its ability to carry out research which translates laboratory discoveries into the clinical setting for the benefit of cancer patients. We are proud of our unique partnership and in this year's report reflect upon the progress we have made and highlight some of our achievements in 2000.

Institute and Hospital Developments

The determination of the sequence of the human genome is a momentous achievement which provides an unparalleled opportunity for cancer research. It will now be possible to understand precisely what goes wrong in tumours at each stage of their progression and to correlate such genetic information with both the course of the disease and treatment responses. The Institute and The Royal Marsden are particularly well placed to exploit this outpouring of genetic data and our scientific strategy for the next decade is centred on positioning our joint institution so that we have available all of the necessary skills and resources.

March saw the beginning of work on the Cancer Genome Project, which was initiated and is led by Institute scientists Mike Stratton and Richard Wooster. This project will define all of the mutations, the damage to our genes, that cause common cancers. The work was made possible by



*Cally Palmer, Chief Executive,
The Royal Marsden NHS Trust*

major funding from The Wellcome Trust and is being conducted at The Trust's Genome Campus at Hinxton near Cambridge. The Institute and The Royal Marsden are supporting the project financially and by putting in place new infrastructures to enable the collection of the required precisely characterised tumour samples.

To ensure the optimal environment for exploiting the output of the Cancer Genome Project and translating the information rapidly for patient



*Peter Rigby, Chief Executive,
The Institute of Cancer Research*

benefit, a new, state-of-the-art laboratory complex, the Cancer Genomics Centre, is being built on the Sutton site. This will expand our facilities and replace those currently housed in our outdated Victorian buildings at Sutton. The Centre will be completed by mid-2002.

The Institute has a major strategic commitment to research into prostate and other male cancers and, building on its considerable strengths in this area, has invested in new facilities to keep our research



Building progress on the Cancer Genomics Centre

at the international forefront. Our Chairman, Dame Stella Rimington, joined world-famous jockey Bob Champion to open Europe's first dedicated Male Urological Cancer Research Centre at The Institute in Sutton in November 2000. The new £3.2 million facility, which was funded by the **everyman** campaign and the Bob Champion Cancer Trust, houses an extensive programme of research into the causes of prostate, testicular and other male urological cancers. It is the first centre of its kind in Europe where researchers investigate the causes and prevention of male cancers as well as their early detection and treatment.

Also in Sutton, a new, state-of-the-art cancer diagnostic centre at The Royal Marsden, The Stanley Cohen Rapid Diagnostic and Assessment Centre, was completed in 2000. It has the first digital mammographic system in the NHS. We will be using this system to monitor patients in our chemoprevention trials, and to evaluate the significance of breast densities for identification and monitoring of risk. The Centre will also provide faster diagnoses for patients with suspected prostate cancer, and allow an endoscopic ultrasound service to be offered at both the Chelsea and Sutton sites. This will improve the accuracy of staging for patients with oesophageal tumours which should lead to better selection of the most appropriate form of treatment. There is also scope for extending the facilities to other types



Male Urological Cancer Research Centre

of cancer helping to save lives by enabling treatment to start more quickly, in line with the Government's new Cancer Plan.

A new high technology radiotherapy machine, which was launched at Chelsea by National Cancer Director Professor Mike Richards, has already proved its worth. The new £1.5 million

linear accelerator offers the latest, most advanced techniques in radiotherapy to fight cancer more effectively. It is capable of delivering a new conformal radiotherapy technique known as Intensity Modulated Radiotherapy (IMRT) which was developed in a partnership between Institute scientists and Hospital clinicians. Using this approach for prostate cancer patients allows radiotherapy to be shaped precisely to the complex contours of their tumours which are wrapped around normal healthy organs, such as the bowel, in the pelvic region.

A new, low-cost, whole-body scanning technique, which could

revolutionise the detection and treatment of cancer and other diseases, was developed by medical physicists at our joint institution. The powerful new scanner – known as PETRA – will allow clinicians to detect the early onset of cancer and determine the rate of tumour growth. We are now seeking a route for the commercial development of the scanner so that it can be made available throughout the NHS.



Left: Mr Stanley Cohen OBE at the opening of The Stanley Cohen Rapid Diagnostic and Assessment Centre



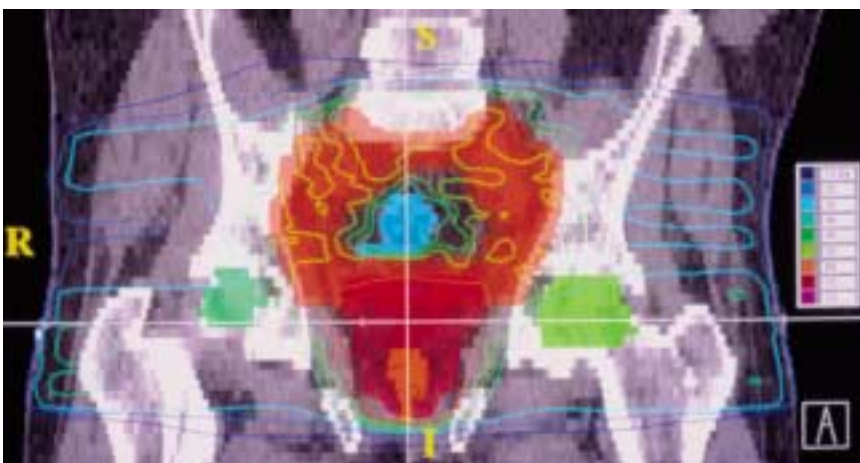
Right: Staff with the first digital diagnosis machine



Shaun Scott and Professor Mike Richards unveil the new radiotherapy machine



Shaun Scott with new radiotherapy machine display unit



Intensity-modulated radiotherapy (IMRT) of prostate and pelvis showing complex high dose treatment areas (orange/red) with avoidance of bowel (blue) in the centre of the pelvis

Research Highlights

We have an outstanding record in cancer genetics and significant progress was made during 2000. Professor Mike Stratton and his colleagues isolated the gene responsible for familial cylindromatosis, a predisposition to tumours of the skin, particularly the scalp. Dr Ros Eeles and her team led a major study of genetic predisposition to prostate cancer and identified two genes, encoding the androgen receptor and the enzyme glutathione transferase, which affect disease incidence and treatment response. Professor Julian Peto made a major contribution to our understanding of breast cancer. From a study of twins he was able to conclude that a high proportion, and perhaps the majority, of breast cancers arises in a genetically susceptible minority of women.

Our new approach to anti-cancer drug development seeks to bring together basic scientists, chemists, pharmacologists and clinicians. An excellent example of this was provided by our pioneering studies of the drug 17AAG, which inhibits Hsp90, a molecular chaperone involved in the synthesis of a number of proteins that play important roles in tumour progression. The structure of the drug bound to its target protein was determined by Professor Laurence Pearl and his colleagues in the newly formed Section of Structural Biology. This structural information will help in the design of improved versions of the drug. DNA microarray analysis, a technology in which The Institute had made a significant investment, was used for the first time to define pharmacodynamic endpoints that were used in the clinical trial led by Dr Ian Judson. The development of non-invasive imaging technologies to assess patients' responses to new drugs is a major feature of our research. A particular milestone was the entry into Phase I clinical trial of our in-house hypoxia imaging agent SR4554. If successful, this agent will provide a valuable means of selecting and monitoring patients using either magnetic resonance imaging or positron emission tomography. The standing of our work in this area was confirmed by the results of an international site visit to The CRC Centre for

Cancer Therapeutics. Its strategy and future plans were strongly endorsed with the award of the highest rating of α^* . This will lead to a significant increase in the Centre's funding from The Cancer Research Campaign over the next five years.

Our work in nursing has a major impact on clinical practice. The fifth edition of "The Royal Marsden Hospital Manual of Clinical Nursing Procedures", a highly successful evidence-based text for cancer nurses, was launched at the International Society of Nurses in Cancer Care Conference in Oslo in July. Debbie Fenlon, a member of the Centre for Cancer and Palliative Care Studies, was awarded The Cancer Research Campaign's Nursing Fellowship for 2000.

Our research workers receive many marks of distinction, and we would particularly like to congratulate the Academic Dean, Professor Stephen Neidle, on being awarded The Royal Society of Chemistry's Biological and Medicinal Chemistry Sector Prize for 1999 in the spring of this year.

Human Resources

The recruitment and retention of staff of the highest international calibre are key to our continued success, and the past year has seen some important changes.

We were particularly delighted to welcome Professor Stan Kaye, an internationally renowned research scientist and clinician, to The Cancer Research Campaign Chair of Medical Oncology and the Chairmanship of the Section of Medicine. Professor Kaye joins us from the University of Glasgow, where he was Head of The CRC Department of Medical Oncology. His appointment will greatly strengthen our capacity to undertake innovative, hypothesis-testing clinical trials of new agents. His move here reunites him with Professor Paul Workman, Director of The CRC Centre for Cancer Therapeutics. They worked closely together when they were both in Glasgow some years ago, and we are confident that the renewal of their partnership will lead to much exciting work in anti-cancer drug development.

Professor Stan Kaye



Our capacity in this area was also significantly increased by the appointment of Dr Ted McDonald as Director of Chemistry within the Centre. He brings with him a wealth of experience in medicinal and combinatorial chemistry, gained in both academia and industry. He was most recently Director of Chemistry at the US company Pharmacopeia.

The field of epidemiology, which seeks to understand the environmental and life-style causes of cancer, will benefit significantly from our new understanding of human genetics. We were therefore pleased to recruit Professor Tony Swerdlow to a new Chair of Epidemiology and to the Directorship of the Department of Health's Cancer Screening Evaluation Unit. He brings with him his Aetiological Epidemiology Team from the London School of Hygiene and Tropical Medicine and will be initiating a number of new studies of major importance.

The Institute and The Royal Marsden have a major commitment to research in cancer nursing and to the development of innovative nurse-led clinical practice. Dr Katherine Froggatt was appointed Head of the Macmillan Practice Development Unit within the Centre for Cancer and Palliative Care Studies and is establishing its new programme of

research. Shelley Dolan became the Hospital's first-ever Nurse Consultant after the Government outlined its plans for the newly created top grade post.

The introduction into clinical practice of new therapies based on our research requires extensive collaboration with the pharmaceutical and biotechnology industries. Effective exploitation of our intellectual property not only benefits patients directly, it can also generate significant additional funds to support cancer research. In order to more effectively manage interactions with industry, The Institute has established an Enterprise Unit headed by Dr Susan Bright, who joined us in November from Lonza Biologics. She will work closely with Dr Simon Dyer, The Royal Marsden's Clinical Research and Development (R&D) Manager, to ensure that jointly owned intellectual property is exploited to the benefit of both institutions.

We said goodbye to Barry Gusterson, Professor of Histopathology, and Founding Director of the Breakthrough Toby Robins Breast Cancer Research Centre on his appointment to the Chair of Pathology in the University of Glasgow. He was appointed as an Associate of The Institute in recognition of his many contributions. Dr Leanne Wiedemann, Reader in Cellular and Molecular Biology, left us after 15 years in the Leukaemia Research Fund Centre for the Cell and Molecular Biology of Leukaemia to return to her native USA. She has taken up a senior position at the new Stowers Institute for Medical Research in Kansas City.

Financial Facts and Figures

The principal sources of income and expenditure for our joint institution are summarised in the Facts and Figures illustration at the end of this review. Full and detailed statements of the financial accounts of The Institute (August 1999 to July 2000) and The Royal Marsden Hospital (April 2000 – March 2001 to be published in September 2001) are separately recorded in our respective Annual Reports and Accounts. In the financial year ending on 31 March 2001, the

Trust met its key financial objectives and achieved a balanced budget. Overall, the combined annual turnover of our institution was £139.3 million, with 85% of this total being devoted to research activities and patient care services. Government funding for our joint research activities (from Department for Education and Employment, Department of Health and Department of Trade and Industry sources) contributes 41% of total funding for research from all sources.

Our grant success rate continues to be outstanding, at 84% of all applications for peer reviewed grants to medical charities and government funding agencies. The Institute is particularly indebted to its major sponsoring partners – The Cancer Research Campaign, Breakthrough Breast Cancer, the Leukaemia Research Fund, the Kay Kendall Leukaemia Fund, The Wellcome Trust, Leopold Muller Trust, Bob Champion Cancer Trust, Macmillan Cancer Relief, and to many other medical research charities.

Commercial partners collaborating in drug development at The Institute and supporting clinical trials at The Royal Marsden include: AstraZeneca Pharmaceuticals, Cyclacel, EPTTCO, KuDOS Pharmaceuticals, Vion Pharmaceuticals and Yamanouchi Pharmaceuticals.

Many organisations also contribute support by providing funds for studentships at The Institute and clinical fellowships at the Hospital. The Hospital and Institute are grateful to all the numerous organisations and supporters who have made investments in our research activities.

In May 2000 The Royal Marsden submitted its annual R&D report for support funding for NHS Providers from the NHS levy. The London Regional Office, in its feedback to the Trust on the report, noted the substantial progress and performance of the Trust against its R&D strategy. The excellent support provided by the external Scientific Advisory Panel was commended, coupled with the strong R&D management involving systems for monitoring research and costing of individual projects. The NHS report was based around nine

designated clinical R&D activity areas, which are reflected in the Research Theme chapters presented in this year's Annual Research Report. The efforts of Professor Alan Horwich, the Director of Clinical R&D, and Dr Simon Dyer in preparing the report were rewarded by the renewal of annual NHS R&D support funding of £17.8 million.

The Institute receives substantial funding (£9.256 million in 2000-2001) from the Higher Education Funding Council for England. Most of this money is awarded in direct recognition of The Institute's scientific excellence, which is measured by the quinquennial Research Assessment Exercise (RAE). The Scientific Secretary, Dr Keith Snell, has been leading the extensive preparations for the 2001 RAE, the financial results of which will be announced next spring. He and his colleagues succeeded in several bids for increased HEFCE funding, including a £1 million capital grant, and a £275,000 grant under the Higher Education Reach-Out to Business and the Community scheme which will support the Enterprise Unit.

Fundraising

There continued to be tremendous public support for The Institute of Cancer Research and The Royal Marsden during 2000, raising money for extra equipment and facilities to keep us at the forefront of patient care and research.

The Royal Marsden was delighted to receive a £1 million donation towards the Rapid Diagnostic and Assessment Centre from Mr Stanley Cohen OBE and £600,000 from the Markus Estate in aid

of the new Rehabilitation Centre at Chelsea which will open in 2001. At The Royal Marsden an army of volunteers generously donated their time, talents and fundraising efforts to make a huge difference for patients.

The Institute was most grateful for a donation of £150,000 from Mr Anthony Weldon for a new mass spectrometer. For The Institute other successes during the year included a Gala Concert at the Royal Festival Hall with the Philharmonia Orchestra raising £95,000, and our team of runners in the London Marathon raising over £30,000. The **everyman** male cancer awareness month held in June was once again launched with a striking advertisement focused this year on raising awareness of prostate cancer and featuring Premier League football stars. Other activities during the month included a successful campaign with ASDA raising £80,000, and the high profile Go Sports Mad day. We would like to thank all those charities, companies and individuals whose support to us is vital.

It gives us great pleasure to present this 2000 Joint Research Report in The Royal Marsden's special anniversary year. As the oldest cancer hospital in the world we are committed to ensuring a better future for the one in three people in this country who will develop cancer during their lifetime. We pay tribute to everyone who has contributed to our achievements this year – in particular our outstanding scientists and clinicians, who deliver a truly excellent service to keep The Royal Marsden Hospital and The Institute of Cancer Research at the forefront of cancer research.

May 2001

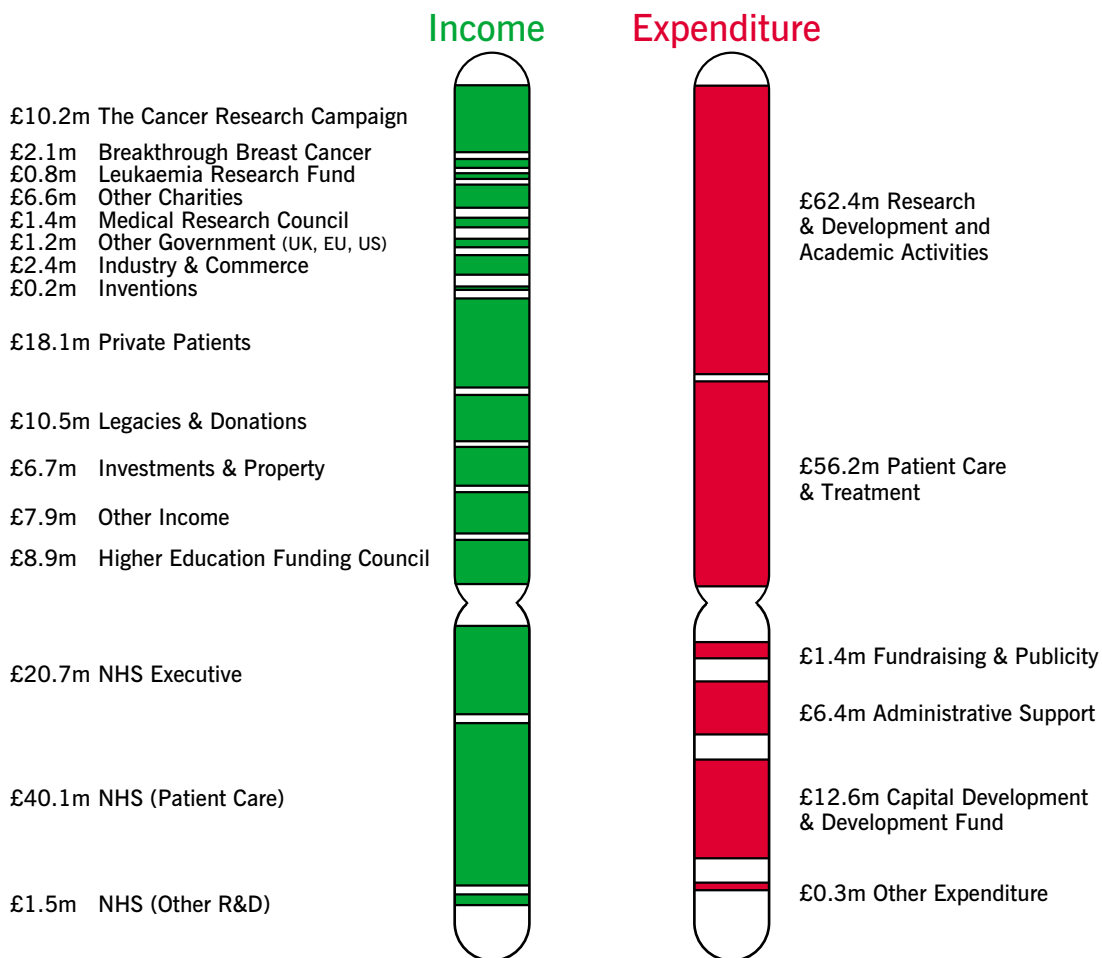
Cally Palmer
Chief Executive
The Royal Marsden NHS Trust

Peter Rigby
Chief Executive
The Institute of Cancer Research

Financial Resources

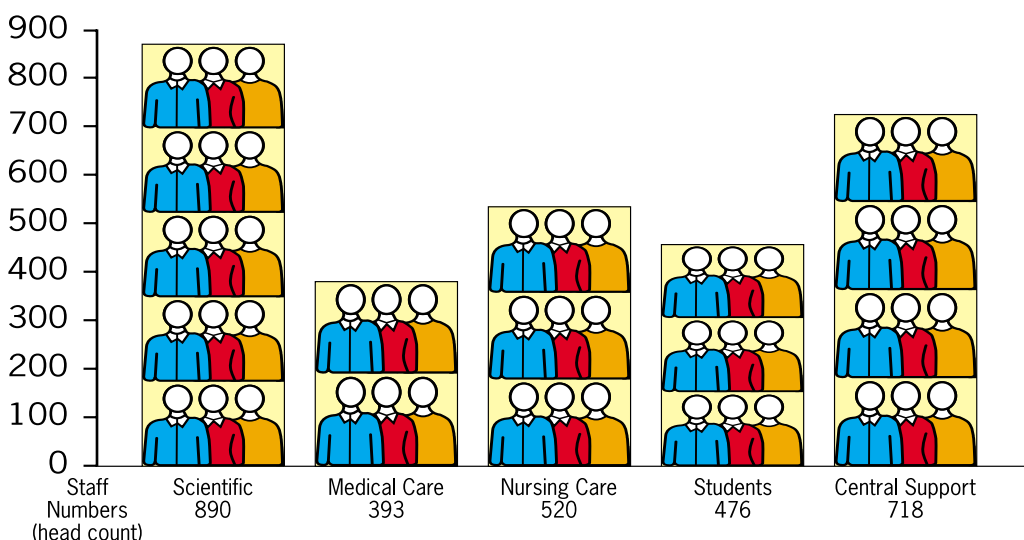
Total Income/Expenditure: £139.3 million

(The Royal Marsden's figures are provisional and unaudited for year end 31.3.01)



Human Resources

Total Staff Numbers: 2639 (includes 358 part-time students)



Looking back, but always ahead

Looking back... Today The Royal Marsden and The Institute together comprise Europe's largest comprehensive cancer centre, committed to providing excellence in cancer research, treatment and education. As the hospital celebrates its 150th anniversary, we look back at some of the key achievements over the last 150 years...



Dr William Marsden 1796-1867

1851: Dr William Marsden opens the world's first hospital dedicated to the fight against cancer in Cannon Row, Westminster – now known as The Royal Marsden NHS Trust

1853: 654 patients are seen in the first two years, 80 per cent women. Total income of the Cancer Hospital is £3,196 19s 1d from annual subscriptions and donations



Above and below: Scenes from the old wards

1855: Baroness Burdett-Coutts loans £3,000 to purchase the Fulham Road site of about an acre at a total cost of £4,500

1862: The Cancer Hospital building in Fulham Road opens, with 30 beds. Eleven years after opening, 4,804 patients are seen and 57 operations carried out

1875/76: The first anaesthetist is appointed and antiseptic techniques are introduced

1895: Electric light is introduced at Fulham Road

1900: Staff includes six surgeons, two anaesthetists, two house surgeons and two pathologists



1903: First X-ray therapies for "intractable cases" – one of the first hospitals to recognise the therapeutic possibilities of X-rays. Plans for a separate research and pathology building are prepared. The first radium treatment is given and the hospital's electrical department gains recognition



The new Cancer Hospital at Brompton, 1862



An operating theatre



Theatre in the early years of the twentieth century



The Cancer Hospital Research Institute

1907: The first diagnostician is appointed specifically to look at the diagnosis of cancer. Annual expenditure of hospital is £15,000 while capacity has grown to 110 beds. Average length of stay per patient is 41 days

1909: The Cancer Hospital Research Institute is established, now The Institute of Cancer Research. It begins its commitment to investigate the causes of cancer and develop new treatments

1910: The hospital is granted a Royal Charter and a specialist department starts pioneering research into radiotherapy

1911: First physicist is appointed to the electrical department. The physics department now has a scientific staff of more than 50

1914 – 1918: 70 beds allocated for the care of war wounded

1920: The first two female doctors are appointed

1925: Numbers 171, 173 and 175 Fulham Road purchased for £5,949 7s 2d to expand the hospital

1928: First notable histopathologist appointed (Dr Piney). Pathology is gaining recognition as an important tool in the diagnosis of cancer

1929: Professor Val Mayneord publishes "The Physics of X-Ray Therapy" – it helps to establish a new era in X-ray therapy

1930s: The work of Ernest Kennaway in The Institute suggests a link between lung cancer and smoking

1930: First UK Chair in radiology is established at the Cancer Hospital

1931: New west wing of hospital is completed at cost of £150,000. Named after Lord Granard who had given a generous contribution. It houses radiotherapy, radiology, outpatients and two private wards

1932: Running costs for hospital are £62,770, including £16,000 on research, £1,612 on drugs and supplies and £6,995 on radiology – reflecting increased use of X-ray. Research at the Cancer Hospital Research Institute identifies carcinogens in coal tar

1934: Granard House is officially opened by Her Majesty Queen Mary

1939: New research institute building is opened at the former masonic hospital on Fulham Road. Named after hospital board member Alfred Chester Beatty who donated £50,000 to equip the building for experimental work



Churchill supports fundraising



Beds allocated for First World War wounded

1940: Alfred Chester Beatty becomes Patron of the Hospital in the year that the Government recognises the importance of cancer treatment and passes the “Cancer Bill” supporting the establishment of cancer treatment centres around the country

1940s: Alexander Haddow starts work in The Institute which leads to the synthesis of three anti-cancer drugs still in use today



Alexander Haddow

1943: Radiology and radiotherapy are recognised as separate specialities

1944: Report into first trials of chemicals to treat patients at the Cancer Hospital. Fifty-three patients are given stilboestrol with some benefits in breast cancer. Marks the beginning of chemotherapy and of the medical treatment of cancer

1947: Clinical chemotherapy group is set up to test new drugs in clinics – the first in Europe

1950s: The first concept of the multi-disciplinary approach to cancer care is developed at the Cancer Hospital, now common practice throughout the world

1951: HRH the Duchess of Gloucester gets Centenary celebrations underway. Annual running costs for hospital are £147,712, including £28,859 for the research institute. The Cancer Hospital is integrated into the NHS with resources allocated for patient care only – not research. As a consequence, the hospital and its research institute are managed separately from this time, though continuing to work in collaboration – bringing the results of research from the laboratory to the clinic

1952: First urological surgeon is appointed, post filled by David Wallace. He is instrumental in introducing a system of grading for bladder cancers which becomes accepted around the world. Plans submitted for the first phase of building work at Sutton, to include 150 beds at a cost of £1,198,000

1954: The first UK screening unit for well women worried about developing breast cancer is established. The Hospital is renamed The Royal Marsden Hospital

1950s/1960s: First trials at The Royal Marsden of anti-cancer compounds – including busulphan and chlorambucil which were synthesised and developed by The Institute of Cancer Research. They are still in use today

1960s: Research begins that results in the discovery of the links between cancer and altered genes. The first nurse specialists introduced at the hospital

1961: Post-registration nursing course in cancer care starts – heralding modern training methods – with advice from Miss (later Dame) Kathleen Raven, Chief Nursing Officer at the Ministry of Health

1963: Her Majesty Queen Elizabeth II officially opens the Sutton site of The Royal Marsden on 20 May 1963

1964: The first palliative care ward – Horder Ward – opens, followed by Chevallier Ward at Sutton, with the appointment of a senior lecturer and then NHS consultant in palliative care. It is the first palliative care service of its kind in Europe



Above and below left: Horder Ward 1964

Below right: Today's palliative care environment





First barrier nursing following X-ray treatment

1965: Open visiting on wards is introduced – one of the first in the UK

1969: First computer is introduced at the hospital to calculate radiotherapy doses/ treatment plans. It stands six feet high and costs the equivalent of £100,000. The Royal Marsden's software package for radiotherapy treatment planning is used by more than 100 cancer centres in the world

1970: Trials of the new platinum-based compound cisplatin prove it is very active against human tumours. Work begins on the second stage of development of the Sutton site to include additional beds, operating theatres and a reverse-barrier nursing ward for patients undergoing bone marrow transplants

1973: Ian Cunneen, the first ever successful bone marrow transplant patient in UK, is treated at The Royal Marsden

1974: The Royal Marsden is given status as a special health authority accountable centrally to the Department of Health. It is the first hospital to gain approval from the Joint Board of Nursing Studies for its cancer nursing courses. Its course for registered nurses starts during 1974 and for enrolled nurses in 1975 – making The Royal Marsden the largest provider of cancer nurse training in the country



Above: New building for MRI Below: Machine ready for use

1976: Robert Tiffany is appointed as Chief Nurse. During the next 17 years he changes the face of cancer nursing world-wide, introducing the first clinical nurse specialist posts in Europe and founds the International Society of Nurses in Cancer Care

1977: First central computer installed at Sutton – 14 feet long, with 64 kilobytes of memory and served by 16 terminals – so that blood test results are accessible on wards and in outpatients. It cost the equivalent of £500,000

1980s: Institute scientists continue to discover and develop anti-cancer drugs, including carboplatin and tomudex

1981: Trials of carboplatin start as a potentially less toxic anti-cancer agent than cisplatin. Today cisplatin and its sister compound carboplatin are probably the most widely used anticancer agents in the world. Hospital computer department has around 20 terminals, by 1994 this grows to 700 terminals. The Royal Marsden has one of the few fully integrated hospital information systems in the UK

1982: Diana, Princess of Wales', first solo official engagement is to The Royal Marsden

1984: "The Royal Marsden's Manual of Clinical Nursing Procedures" is first published. Now regarded as the standard nursing textbook world-wide, its fifth edition is a best seller



1986: First randomised study is launched by Professor Trevor Powles using tamoxifen as a preventative measure against breast cancer. This develops into a multicentre, multi-national study. At the same time, the first MRI (Magnetic Resonance Imaging) scanner is introduced

1987: Department of Endocrinology is set up. Chair in Haematology is established, Professor Daniel Catovsky is appointed

1988: Rehabilitation Unit at Chelsea opens. This innovative approach brings services together for patients to encourage a holistic approach to rehabilitation in cancer care

1989: Diana, Princess of Wales, becomes President of The Royal Marsden and leads the public appeal to raise £25 million to redevelop the London site and build a new children's unit at Sutton

1990: Academic Nursing Unit is established

1991: Presentation to The Institute, the hospital and Johnson Matthey Technology Centre of the Queen's Award for Technological Achievement, for work on carboplatin. The Royal Marsden is the first hospital in the NHS to achieve this recognition

1992: Diana, Princess of Wales, officially opens the new children's unit at Sutton

1994: The Royal Marsden is granted NHS Trust status – ending speculation about its future as a single specialty hospital

1995: The *BRCA2* gene is isolated and sequenced by Institute scientists – a critical discovery in the prevention and treatment of breast cancer. The Royal Marsden is awarded a Charter Mark for excellent service to the public. This was again awarded in 1998

1996: First chair of cancer nursing is awarded to Jessica Corner

1998: The Royal Marsden launches its website as an authoritative source of information for patients and health care professionals world-wide. The website now receives 50,000 hits each month

1999: The Royal Marsden's first Nurse Consultant is appointed, one of only 30 new top grade posts created across London. First dedicated breast cancer research centre opens

2000: Clinical trials begin using a new high-tech radiotherapy technique – Intensity Modulated Radiotherapy (IMRT) – to halt the spread of prostate cancer using 3D beams curved around the shape of tumours. The Institute of Cancer Research leads the Cancer Genome Project, which is set to revolutionise the search for cancer genes, and the first testicular cancer gene is located

2001: The Royal Marsden celebrates 150 years of excellence in cancer care



Above: The new Institute building at Chelsea opened in 1999

Below: The new Royal Marsden building at Sutton



...but always ahead

Innovative changes continue to place The Royal Marsden and The Institute at the leading edge of cancer research, treatment and education. Looking back at the achievements of the last 150 years we have much to be proud of. But we remain as committed today as we have always been. As we look to the future, we strive for excellence in cancer research, treatment and education.

Academic Dean's Report for 2000

The Faculty

Several members of the Faculty of The Institute received conferred academic titles of the University of London during this year. Conferment of Chairs were made on Dr Ian Smith, as Professor of Cancer Medicine and Dr Tariq Enver, as Professor of Molecular Haematology. Readerships were conferred on Dr Estella Matutes (Haematological Malignancies), on Dr Sibylle Mittnacht (Molecular Cancer Biology) and Ms Judith Bliss (Clinical Trials). We are delighted to welcome two new senior members of Faculty. Professor Tony Swerdlow has joined us from the London School of Hygiene and Tropical Medicine to take up the newly-instituted second Chair in Epidemiology and the Directorship of the Department of Health Cancer Screening Evaluation Unit. Professor Stan Kaye, from the University of Glasgow, has been appointed to the vacant CRC Chair of Medical Oncology. Drs Angelo Bifone, Michael Olson and Colin Porter were granted the status of Teacher of the University of London.

Conferences, Lectures and Seminars

A highlight of the academic year at The Institute is the annual residential conference. This aims to share knowledge and expertise across The Institute and The Royal Marsden, and to encourage collaboration in research through common purpose. Staff and students contribute in a variety of ways; the blend of lectures, student presentations and team poster presentations display the breadth and depth of research. The 2000 Conference was held at the University of Surrey in July, and their facilities enabled a substantial increase in numbers to be accommodated. A number of topical themes were highlighted. "Breast cancer: from gene discovery to experimental therapeutics" and "New technologies, microarrays and genomics" attracted packed audiences, with the high quality of the

talks reflecting the excellence of the fundamental and translational science underway in our two institutions. Professor John Dick, the Haddow Visiting Professor, gave a talk on modelling human haematopoiesis, and Professor Ian Smith, the newly-appointed Medical Director of The Royal Marsden, spoke on the issues facing translational research in cancer medicine. As ever, the student presentations were of a very high standard, demonstrating our continuing success in attracting graduate students of the highest quality. The first prize for student oral presentations was awarded to Francesca Buffa for her presentation on "Radiobiological models and predictive assays: how far from individualising treatments?" Second prize went jointly to Paul Bradshaw and Duncan Gascoyne. The judges in the poster session had an almost impossible task in view of the clarity of the presentations but eventually chose James Heyes' poster on "Design of novel cationic lipids". The second prize was awarded jointly to Richard Holland and Sarah Welsh.

The Institute continues to attract outstanding speakers for its Distinguished Lecture Series.

We welcomed Sir Paul Nurse FRS (ICRF, London), Professors Peter Selby (ICRF, Leeds), Suzanne Cory FRS (Melbourne), and John Gurdon FRS (Cambridge). Professor Adrian Harris, the Director of the ICRF Clinical Unit in Oxford, gave the annual Link Lecture on "Hypoxia signalling pathways: role in tumour growth and targets for therapy", and spent two fruitful days meeting Institute and Royal Marsden staff.

The Sutton Site Lectures and numerous Sectional Seminars in Chelsea continue to provide staff and students on both sites with the opportunity to keep abreast of scientific developments, in addition to the numerous journal clubs, other seminars and small discussion groups. A new system of inter-site lectures has been instituted, with senior Faculty from one campus giving a lecture on the other campus; this innovation is proving very popular and is already improving contacts between the two sites. Many Institute and Royal Marsden Faculty participate in formal teaching activities nationally and internationally. Especially noteworthy is the Winter School on "Intensity Modulated Radiation Therapy" run by the Joint Department of Physics, which attracts a large international audience, and is a showcase for their continuing high reputation in this field.



Dr Ann Jackman (left) awarding the prize for best final year PhD Students to Jan Wolber (right), Professor Stephen Neidle (centre)

SHORT COURSES IN 2000			
	Number of Delegates		Number of Delegates
Magnetic Resonance Imaging in Oncology <i>7th–9th February 2000, Professor J Husband</i>	86	Sexuality and Cancer Care <i>28th–29th September 2000, Amanda Baxter and Moira Stephens</i>	27
Radiotherapy Physics Course <i>6th–10th March 2000</i>	48	Breast Cancer Study Day for Physiotherapists <i>12th October 2000, Karen Robb and Thea Chittenden</i>	94
Practical issues in Total Laryngectomy Cancer Care <i>30th March 2000, Brian Lake and Marcel Ball</i>	74	Overview of Feeding Gastrostomy Tubes in Oncology Patients <i>26th October 2000, Sue Haig</i>	30
Medical Imaging Physics Course Parts 4 and 5 Diagnostic Radiology & CT and Magnetic Resonance Imaging <i>March 2000</i>	25	Upper Gastro-intestinal Cancer Update <i>20th October 2000, R Sitamvaram and S Legge</i>	110
Physics Radiation Protection Training <i>10th–14th April 2000</i>	31	Radiotherapy Physics Course <i>6th–10th November 2000</i>	37
Palliative Care in Childhood and Adolescence <i>18th May 2000, Brian Lake and Jackie Edwards</i>	73	Imaging Course, Diagnostic Radiology <i>November 2000</i>	14
Recent Advances in Cancer Care <i>26th June 2000, Brian Lake</i>	25	9 th Annual Course in Clinical and Laboratory Aspects of Leukaemia & Lymphoma <i>7th–10th November 2000, Professor D Catovsky</i>	
Update on Psycho-Oncology <i>30th June 2000, Dr M Watson and Dr P Crichton</i>	60	Day 1 [microscopy]	19
Palliative Cancer Care Update <i>1st September 2000, Diana Laverly</i>	80	Day 2 [lecture day 1]	47
		Day 3 [lecture day 2]	60
		Day 4 [microscopy]	21
		TOTAL	961

Students

Demand for entry to our PhD research-training programme remains high. 481 enquiries generated 217 formal applications. The number of new MPhil/PhD students admitted this year was 23, making a total of 118 registered PhD students. In addition, we have 23 part-time MPhil/PhD registrations and 17 students registered for the degrees of MD and MS. All students attend a course of lectures and seminars in their first year, which provides a broad overview of cancer biology and medicine. A multi-module web-based course is currently being developed in the Interactive Education Unit by Dr Kate Allen, with the help of colleagues in The Institute and The Royal Marsden. This will provide students with a greater range of educational opportunities than is currently possible, given the constraints on all graduate students' time.

We are grateful to a number of organisations which have provided support for our students during the past year, notably The Cancer Research Campaign, the Medical Research Council, The Royal Marsden NHS Trust, the Leukaemia Research Fund, the Engineering and Physical

STUDENT PROFILE 2000 (1999)		
	Full-time	Part-time
Undergraduate Students		
Diploma/BSc in Cancer Nursing	0 (0)	189 (243)
Diploma/BSc in Palliative Nursing	0 (0)	78 (73)
Sub-total	0 (0)	267 (316)
Postgraduate Taught Students		
MSc in Cancer Care	0 (0)	18 (23)
MSc in Palliative Care	0 (0)	9 (22)
MSc in Cancer Care (Genetics)	0 (0)	0 (2)
MSc in Cancer Nursing	0 (0)	2 (0)
Postgraduate Diploma in Cancer Care	0 (0)	11 (4)
Postgraduate Diploma in Palliative Care	0 (0)	9 (6)
Postgraduate Diploma in Cancer Care (Genetics)	0 (0)	2 (1)
Sub-total	0 (0)	51 (58)
Postgraduate Research Students		
MPhil/PhD	118 (122)	23 (29)
MD/MS	0 (0)	17 (18)
Sub-total	118 (122)	40 (47)
Total Student Numbers	118 (122)	358 (421)

Sciences Research Council, and the European Union. Maja Krutzfeldt is the fourth student to hold the Association for International Cancer Research Studentship. 53 students undertook

postgraduate diplomas and masters courses in Cancer Care and Palliative Care, whilst 279 students registered for our undergraduate diplomas and degrees. An important part of our



From the left: Professor Jessica Corner awarding The Joan Frances Stowe Prize for outstanding contributions in the field of palliative care to Catherine Wilson

contribution to its work, and to cancer research more generally. Mr Nicholas Clarke, Professor Barry Gusterson and Mr Derek Simmons were honoured as Associates of The Institute in recognition of their many years of service and achievements. Following on from the presentations, Sir Richard, who was Chairman of The Institute's Board for many years, gave a typically erudite talk on the past, present and future of cancer research and treatment.

Visitors

The Haddow Fund continues to foster links and to actively encourage collaboration with the international scientific community. A number of scientists visited The Institute, supported by the Fund. Dr Regina Kenen of the College of New Jersey, USA, joined Dr Ros Eeles' Cancer Genetics Team in January 2000 for a six month stay to complement a holistic research programme in cancer genetics and the management of cancer families. Professor John Dick from the Department of Molecular and Medical Genetics, the University of Toronto joined Professor Mel Greaves in the LRF Centre in May 2000 for a four month visit. Professor Dick is internationally recognised for his work on engraftment of human leukaemia and normal stem cells in *SCID* mice, and was appointed as Haddow Visiting Professor for the duration of his stay. Professor Richard D Brunning, a distinguished American haematologist from the Department of Laboratory Medicine and Pathology, University of Minnesota, joined

work is training new clinical oncologists and there are currently 19 trainees pursuing research fellowships within The Institute.

The welfare of our students is in the hands of the Deputy Deans and the Senior Tutor for the Chester Beatty laboratories. Dr Leanne Wiedemann, who has been extremely effective and supportive as Senior Tutor, moved to the USA during the year. She has been succeeded by Dr Sibylle Mitnacht.

The Institute's Graduation Ceremony this year took place at the University of London's Senate House. For students and their families it provided a perfect setting for the celebration of their awards. This year's speaker, Professor Sir Richard Doll, paid

tribute to the quality and range of The Institute's graduates. 26 PhD degrees, five MSc degrees and three postgraduate diplomas were awarded by the University of London, and 97 BSc and diploma awards were granted by the University of Manchester. Jan Wolber and Martin Read were awarded the prize for the best final year PhD Students. The Joan Frances Stowe Prize for outstanding contributions in the field of palliative care was awarded to Catherine Wilson.

The Institute has recently established two special categories of awards, Fellows and Associates. The Institute's Chairman, Dame Stella Rimington, presented Professor Sir Richard Doll, Lord Faringdon and Professor G Westbury as Fellows of The Institute, in recognition of their significant



From the left: Dame Stella Rimington, presenting Professor Sir Richard Doll, Lord Faringdon and Professor G Westbury as Fellows of The Institute

DEGREES AWARDED IN 2000

**Degree of PhD
(University of London)**

Degree of PhD (University of London)	Section/Unit
William John Anderson	Paediatric Oncology
Geoffrey Ian Butts	Joint Department of Physics
Nadine Claire Collins	Cancer Genetics
Harvinder Dosanjh	CRC Biomolecular Structure Unit
Marvin Morace Doyley	Joint Department of Physics
Rosalind Anne Eeles	Cancer Genetics
John David Fenwick	Joint Department of Physics
Hakan Goker	Molecular Carcinogenesis
Christine Gorman	CRC Biomolecular Structure Unit
Matthew Guy	Joint Department of Physics
Samantha Jayne Hibbits	Virology
Jacqueline Morag Horn	Cell and Molecular Biology
Lisa Hutchinson	Cell Biology and Experimental Pathology
Alexandra Alicia Johanna King	Gene Function and Regulation
Philip Stephen Murphy	Joint Department of Physics
John Henry Peacock	Radiotherapy Research Unit
Johanna Kate Perry	Breakthrough Toby Robins Breast Cancer Research Centre
Massimo Pizzato	Virology
Martin Read	CRC Biomolecular Structure Unit
Jacqueline Denise Reeves	Virology
Susan Christine Short	Gray Laboratory Research Trust/ Radiotherapy Research Unit
Graham William Simmonds	Virology
Meiko Takahashi	Cancer Genetics
Antony Graham Willis	Academic Haematology
Jan Wolber	Magnetic Resonance Imaging Unit
Valter Joseph Zani	Academic Haematology

**MSc in Cancer Care
(University of London)**

Frances Davies
Nancy Hadfield
Catherine Wilson

**MSc in Palliative Care
(University of London)**

Bridget Gwilliam
Jan Smith

**Postgraduate Diploma in Cancer Care
(University of London)**

Susan Kingdom
Linda Purandare

**Postgraduate Diploma in Palliative Care
(University of London)**

Peter Sheahan

**BSc in Cancer Nursing
(University of Manchester)**

Karen Austin (*awarded posthumously*)
Kim Barker
Sarah Bate
Rachel Bennett
Lisa Blackman
Fiona Cameron
Janice Chalkley
Katie Downes
Denise Dunsire
Elizabeth Fenn
Lisa Gale
Karen Gunson
Ann Green
Rachelle Hall
Catherine Halton
Karen Harrold
Denise Heming
Teresa Hickey
Bethan Jackson
Christine Jordan
Philippa Lloyd
Pauline McGough
Catherine McKirdy
Georgina McMahon
Jennifer Morrison
Wayne Naylor
Frances Neville
Ruith Phillips
Lisa Pink
Elizabeth Rae
Kulveer Rehsi
Jorn Rixen-Osterbro
Catherine Thomas
Dana Walker
Victoria Wilson
Michelle Wong

**BSc in Palliative Nursing
(University of Manchester)**

Margaret Coy
Joan Douglass
Linda Doyle
Diane Haywood
Julie Kinley
Mary McSweeney
Paulina Queenan
Debra White

**Diploma in Breast Care Nursing
(University of Manchester)**

Patricia Paterson
Jennifer Peters
Kirsten Regan
Caroline Turner

**Diploma in Cancer Nursing
(University of Manchester)**

Wendy Bines
Anthony Blades
Mary Brennan
Sally Bridger
Liza Cooper
Jennifer Dixon
Jonathan Dowman
Julia Espitalier-Noel
Sian Evans
Monica Hamill
Carol Harris
Lesley Heveldt
Justine Hofland
Marion Jeffrey
Fiona Kearns
Abigail Maccartney
Theresa Mann
Elizabeth Morrin
Linda O'Shea
Natalie Pattison
Kajal Rahmat
Tracey Ryan
Audrey Sharp
Brenda Southern
Rebecca Talbot Rice
Siew Tan
Vanda Taylor
Catherine Thelwell
Maria Weiss

**Diploma in Paediatric Cancer
Nursing (University of Manchester)**

Catherine Brady
Lynne Eleanor Forrester
Indraneel Hancock
Cathryn Hole
Angela Mayle

**Diploma in Palliative Nursing
(University of Manchester)**

Nicola Andrews
Tonia Canino
Stephanie Collier
Briony Dinsdale
Christine Evans
Sally Gosling
Christine Humpish
Zufilka Isaac
Katherine Jones
Christine Lloyd
Judith Londe
Sandra Sheene
Maura St George
Rachel Steel Griffiths
Ann West



From the left: Dame Stella Rimington, presenting Mr Nicholas Clarke, Professor Barry Gusterson and Mr Derek Simmons as Associates of The Institute

Professor Daniel Catovsky for a short stay in July 2000 to work on a collaborative project. Miss Paraskevi Briassouli of the National Hellenic Research Foundation, Laboratory of Gene Regulation, Athens, joined Dr Michelle Garrett from July 2000 for a three month stay to work on the role of RAS signalling in cell-cycle progression.

Dr Marc Bollet, Val de Grace Military Hospital, Paris joined Dr Robert Huddart in The Section of Radiotherapy in September 2000 for a year-long visit to work on improving accuracy of radiotherapy treatment planning and verification. Professor Paul Barbone from the Department of Aerospace and Mechanical Engineering, Boston

University, commenced a year-long visit in October 2000 with Dr Jeff Bamber in the Joint Department of Physics, helping his team develop a quantitative version of their tissue elasticity imaging method.

Professor Stephen Neidle
Academic Dean

Technology Transfer Report – The Institute Enterprise Unit

In November 2000 The Institute established its own technology transfer function by creating The Enterprise Unit. Dr Susan Bright was appointed as director of the Unit and brings to the role many years of commercial experience in the pharmaceutical and biotechnology industries. The Unit will have two other business development personnel who will have strong and appropriate scientific backgrounds.

The Enterprise Unit provides The Institute with the appropriate skills in licensing, intellectual property management and the negotiation of collaborative research contracts with industry. The Unit is responsible for all commercial and intellectual property matters within The Institute and will also work very closely with The Royal Marsden through its Clinical Research Manager. The Unit will act on behalf of both The Institute and The Royal Marsden to exploit jointly owned intellectual property. Any commercial endeavour will be designed to augment and enhance the missions of both institutions.

CRC Technology Ltd (CRCT) will continue to take the lead in exploiting intellectual property that arises from CRC funded projects. The Enterprise Unit will liaise with CRCT as appropriate to facilitate and support as required.

Prior to November 2000 CRCT took the lead in the exploitation of all matters relating to intellectual property from The Institute. This report summarises progress made by CRCT during the year.

In 1999 the spin-out company EPTTCO was established between The Institute, CRCT, the University of Auckland and the Centre for Applied

Microbiology and Research (CAMR). This company was founded to exploit a number of different prodrug approaches including gene directed enzyme prodrug therapy (GDEPT). Steady progress was made throughout 2000 both at a scientific and business level. Collaborations with Vion Pharmaceuticals and AstraZeneca Pharmaceuticals continued and new prodrug approaches were added to the EPTTCO portfolio. The company hopes to raise additional funds in 2001.

A second spin-out company, PETRRA, was formed in 2000 between The Institute/The Royal Marsden, CRCT, the Rutherford Appleton Laboratory, BTG and UMIST Ventures Ltd. This company was founded to develop the novel PET camera invented by The Institute and the Rutherford Appleton Laboratory. Good scientific progress was made throughout the year and the first clinical trials of the camera will take place in 2001. The strategy for the next phase of PETRRA's development will be determined in 2001.

CRCT continued to develop the concept of a company based on the partnership between Professor Paul Workman in The Institute and Professor Tony Kouzarides in Cambridge. This company will be known as Chroma Therapeutics and will focus on chromatin regulating targets. It is hoped that the financing will be finalised in 2001.

In 1999 CRCT established the collaboration between The Institute, the Imperial Cancer Research Fund, the Ludwig Institute for Cancer Research and Yamanouchi Pharmaceuticals in the area of phosphoinositide 3 kinase inhibitors. This collaboration was extended in 2000 and a substantial programme of work is underway at The Institute.

The Institute and The Royal Marsden have collaborated with a number of commercial partners throughout 2000, including a project with Cyclacel on cyclin-dependent kinase inhibitors and a project with Kudos.

The current patent portfolio held by CRCT on behalf of The Institute/The Royal Marsden consists of 26 patents. During the year 3 new cases were filed and 2 abandoned. In addition BTG hold some Institute/Marsden patents. The Institute and The Royal Marsden gain royalty and milestone income from compounds that have been licensed to pharmaceutical companies. These include 'Tomudex', a quinazoline inhibitor that is licensed to AstraZeneca Pharmaceuticals and platinum drugs that are licensed to AnorMED. The portfolio of patents relating to quinazoline based thymidylate synthase inhibitors are managed by BTG who are seeking additional commercial partners in this area.

In the future the Enterprise Unit will work closely with CRCT and other partners such as BTG and UMIST Ventures Ltd to build on past successes and to establish new commercial opportunities that enhance the mission of The Institute and The Royal Marsden.