Clinical careers

2013 report
Our funding for clinical academics

Cancer Research UK supports doctors undertaking research at every stage of a clinical career, from Research Bursaries (pre-PhD) to Senior Cancer Research Fellowships (Group Leaders) and programme grant holders. Clinicians form a vital link between cancer patients and our research into understanding cancer.

- **Research Bursaries**
  Short-term funding for clinicians and allied health professionals who want to pursue an academic research career.
  - 64 Bursaries awarded (May 2004 – Nov 2013)
  - Up to 10 new Bursaries per year

- **Clinical Research Training Fellowships (CRTF)**
  Support PhD research during clinical training. Funded through Centre Training Accounts, at core-funded Institutes, or as part of special initiatives.
  - 98 current Clinical Research Training Fellows
  - Up to 41 new Clinical Research Training Fellows appointed each year in Centres (26) and Institutes (15)

- **Senior Cancer Research Fellowships (SCaRF)**
  Supports clinical academics to develop their research group.
  - 4 current Senior Fellows are clinicians

- **Career Establishment Awards (CEA)**
  Allow clinicians and non-clinicians in their first university position to develop their independent research group. One new CEA was awarded to a clinician this year.
  
- **Clinician Scientist Fellowships (CSF)**
  Allow clinicians to develop their independent research career, in combination with specialist training or clinical practice.
  - 20 current Clinician Scientist Fellows
  - 5 fellowships funded in 2013
Our Research Bursary Scheme

Cancer Research UK’s Research Bursaries for Clinicians and Professions Allied to Medicine provides short-term support for those in clinical training that are interested in pursuing a career in cancer research.

We have funded between five and ten applicants each year the scheme has run since 2004. We have received 134 applications and funded 64 bursaries (48%).

We are one of the few funders to provide research funding for Academic Clinical Fellows, and we spent £143,700 on 8 new bursaries in 2012.

We are one of the few major research funders to support early career clinicians before they start a PhD. We will fund applications from allied health professionals as well as clinicians.

We run two application rounds per year.

Figure 1: Application numbers for Research Bursaries
Our Clinical Research Training Fellows

The CRUK Clinical Research Training Fellowships support clinicians undertaking PhD research projects, and these fellowships are usually the clinicians’ first period of full-time research. The trainees undertake research full-time, as out-of-programme experience, with minimal clinical commitments. This funding is usually awarded to those in a Specialist Training post.

About our Clinical Research Training Fellows
Cancer Research UK supports clinicians who want to undertake higher research degrees that complement their clinical practice. Since 2008 we have supported doctoral training for clinicians through our Institutes and our Centre training accounts.

In April 2013, Cancer Research UK was supporting 98 Clinical Research Training Fellows. These fellows are from a variety of specialities (Figure 2) and are based at a broad range of locations (Figure 3).

Figure 2: Specialties of current Clinical Research Training Fellows

Figure 3: Locations of current Clinical Research Training Fellows
Our Clinician Scientists

A Clinician Scientist Fellowship is a post-doctoral level scheme which enables clinicians to undertake cancer research whilst continuing their clinical duties (20-50% of the fellow’s time must be spent on clinical commitments). The scheme aims to aid the fellow to transition from doctoral research training to an independent clinical academic post. Clinician Scientists may still be in specialist training, or they may have already completed their clinical training and be a consultant.

About our Clinician Scientists
Cancer Research UK supports 20 Clinician Scientists, from a broad range of clinical specialties (figure 4) and locations across the UK (figure 5). 40% of our Clinician Scientist Fellows are female.

After the interviews in May 2013, we awarded five fellowships: four were current Clinician Scientist Fellows who successfully renewed their fellowships, and one was a new fellow. The five fellows awarded in 2013 specialise in Surgery, Clinical Radiology, Gastroenterology and Medical Oncology. We aim to award up to five Fellowships per year, which will keep the number of fellows at a steady state of about 20 in total.

Figure 4: Specialties of current Clinician Scientists

Figure 5: Locations of current Clinician Scientists
Clinician Scientist Fellows in 2013

In 2013 we awarded five Clinician Scientist Fellowships to clinicians from a range of medical specialities based across the UK.

Simon Buczacki, Cambridge Research Institute
*Manipulating the quiescent cancer stem cell niche in colorectal cancer*

Mr Simon Buczacki is a surgeon based at the Cancer Research UK Cambridge Research Institute, who specialises in treating people with bowel cancer. He and his team are studying how bowel cancers become resistant to treatment and start growing again.

Researchers now think that some types of cancer are fuelled by special ‘cancer stem cells’, which are resistant to treatment. Mr Buczacki and his team are studying cancer stem cells from bowel tumours removed during surgery. They are growing the stem cells in the lab to try to understand where cancer stem cells come from and why these cells are resistant to chemotherapy. Once they understand how the stem cells protect themselves, they will investigate ways to block these self-defence mechanisms, which could lead to new therapies.

This research may uncover crucial new ways to overcome drug resistance and make chemotherapy more effective in the future.

“Being awarded a Cancer Research UK Clinician Scientist Fellowship will enable me to carry out cutting edge cancer stem cell research into a novel mode of improving the effectiveness of current chemotherapies for colorectal cancer. I greatly look forward to being given the opportunity to combine operating on patients with colorectal cancer at Addenbrooke’s Hospital together with carrying out translational research at a world class research institute.” *Simon Buczacki, New Cancer Research UK Clinical Scientist Fellow*

“Medical doctors specialising in Cancer Medicine are uniquely placed to identify clues as to the causes of cancer from the patients they see, and also to bring new developments from the laboratory to bear on their patients’ treatment. This new group of Clinician Scientists, supported by Cancer Research UK, will now be able to develop in a career structure that allows them to bridge the gap between the clinic and the laboratory to their patients’ benefit”  *Professor Philip Johnson, Chairman of Cancer Research UK’s Clinical Fellowship Panel*
Ferdia Gallagher, University of Cambridge

Development of hyperpolarised carbon-13 MRI as a novel clinical imaging tool in oncology

Imaging gives doctors a crucial view of studying cancer – it allows us to see where cancer has spread to within the body and is used to identify how a patient’s tumour is changing in response to the drugs that they have been given. This means it plays an important role during each phase of a patient’s cancer journey: diagnosis, treatment monitoring and follow-up. Dr Ferdia Gallagher’s aim is to make one particular imaging technique – magnetic resonance imaging (MRI) – more powerful by using it to image the metabolism that occurs within tumours.

He’s based at the University of Cambridge – home to a revolutionary new device which is many times more sensitive than traditional MRI. And in a world-first, he’ll put it through its paces in ovarian cancer.

The key question to answer is how well the new technique stacks up against more conventional ways of looking at a tumour. Early indications are promising and hopes are high that this exciting technique could transform cancer imaging.

"This CRUK clinician scientist fellowship will give me the opportunity to translate the new imaging techniques that we have been developing over the last seven years in the laboratory into clinical imaging of cancer patients. As a clinical radiologist, I will study how these new methods can be used to detect cancer earlier, as well as identifying when a patient successfully responds to chemotherapy or radiotherapy." Ferdia Gallagher, Renewing Cancer Research UK Clinical Scientist Fellow

Simon Leedham, University of Oxford

The role of the Bone Morphogenetic Protein (BMP) pathway in the pathogenesis of inherited and sporadic colorectal cancers

Based at the University of Oxford, Dr Leedham’s goal is to untangle the molecular mess found in bowel cancer cells.

He’s particularly interested in the signals that turn healthy cells into tumour cells. His work has already pointed the finger at a family of molecules called the bone morphogenetic proteins (BMPs). We know that the BMPs are normally involved in preventing stem-cells from dividing in an uncontrolled fashion but what are they doing in bowel cancer? Dr Leedham’s next challenge is to investigate how their misbehaviour can lead to bowel tumour development.

These findings could form the basis for new targeted drugs, and they could lead to more sensitive methods of detecting the disease in its early stages. Or, they could help scientists develop strategies to prevent bowel cancer altogether. Either way, this exciting work could improve the outlook for bowel cancer patients in the UK and beyond.

"The Cancer Research UK Clinician Scientist fellowship is unrivalled in its support for early career academic clinicians. The salary support in these fellowships has allowed me to concentrate on my research and the ability to apply for renewal of funding after 4 years has given me the opportunity to develop a sustainable research program and skills that will enable me to make the transition to an independent investigator." Simon Leedham, Renewing Cancer Research UK Clinical Scientist Fellow
Ultan McDermott, Wellcome Trust Sanger Institute
Harnessing transposons for drug resistance gene discovery in cancer

Ultan McDermott and his team at the Wellcome Trust Sanger Institute in Cambridge are trying to uncover how cancer cells become resistant to drugs, to find ways to block these escape routes.

Modern cancer drugs often home in on particular genetic faults that underpin the cancer cells, including treatments for skin and lung cancers. But one major challenge for doctors is that even though patients respond well at first, the cancer cells can adapt over time to become resistant to these types of therapies and continue to grow.

Dr McDermott and his group are carrying out in depth DNA testing to find the genetic faults in skin and lung cancer cells grown in the lab that have become resistant to ‘targeted’ drugs. Using this knowledge, they will study these genes further to find out which are the most important and how they help the cancer cells become drug resistant.

Understanding how cancers override drugs will lead to new ways of overcoming resistance in the future, helping more people beat cancer.

“It is hard to imagine a more exciting time for cancer research. We stand on the cusp of truly personalising cancer medicine for the first time, through the integration of genomics, transcriptomics and proteomics. We have a unique opportunity to fundamentally change how we treat patients and how we design tomorrow’s clinical trials. The Clinician Scientist Fellowship offers clinicians an opportunity to be a part of this revolution and moreover to bring a unique clinical perspective as to how these technologies will ultimately improve the lives of our patients.” Ultan McDermott, Renewing Cancer Research UK Clinical Scientist Fellow

Nicholas Turner, Institute of Cancer Research
Targeting aberrant fibroblast growth factor receptor signalling in cancer

Dr Nicholas Turner and his colleagues at The Institute of Cancer Research in London are studying how a molecule called FGFR could be targeted to treat some breast and lung cancers.

FGFR is part of a network of signals that is overactive in a number of cancers and treatments are being developed that block FGFR. Dr Turner wants to find out why some breast and lung cancers respond to these treatments, and yet others don’t respond to these treatments even though they have overactive FGFR.

By understanding more about the role of FGFR, Dr Turner hopes to uncover more effective combinations of drugs to investigate in clinical trials and develop new tests to identify who would be most likely to benefit from them.

"The Cancer Research UK Clinician Scientist fellowship has been key to the development of my career, allowing me to set up my laboratory and to become an independent researcher.” Nicholas Turner, Renewing Cancer Research UK Clinical Scientist Fellow
Our Clinical New Investigators

CRUK runs three schemes for New Investigators: the Senior Cancer Research Fellowship, Career Development Fellowship, and the Career Establishment Award. There are five clinicians amongst our New Investigators.

Current Clinician Senior Fellows:

**Thorsten Hagemann**, Queen Mary University of London
*Mammalian target of rapamycin (mTOR) regulates innate immune function in the tumour microenvironment*

**Susan Short**, University of Leeds
*Therapeutic potential of targeting DNA repair in CNS tumours*

**Faith Davies**, The Institute of Cancer Research
*Targeting intracellular protein handling as a strategy for cancer therapy; using Multiple Myeloma as a model*

**Reuben Tooze**, University of Leeds
*Analysis of the IRF4 gene regulatory network in B-cell malignancies: linking disease mechanism and biomarker detection*

New Clinician Career Establishment Award holder (awarded April 2013):

**Dr Nicola Valeri**, The Institute of Cancer Research - *Targeting microRNAs driving colon carcinogenesis*

Dr Nicola Valeri and his team at The Institute of Cancer Research in London are studying how genes are switched on and off in bowel cancer cells and how the switches could be targeted to stop cancer in its tracks.

Cancer cells have faulty patterns of gene activity, meaning that they multiply out of control. Some of our genes are turned on or off by switches called microRNAs. Dr Valeri thinks these switches are important in the early development and spread of bowel cancer.

Dr Valeri’s team are studying which switches are altered in bowel cancer cells compared to healthy cells. They are also investigating whether these switches could be targeted to re-activate the cell’s brakes and stop them dividing. This research could lead to new drugs that overcome the faulty genes that cause bowel cancer and stop bowel tumours from growing.

“The Cancer Research UK Career Establishment Award represents an invaluable resource to support and boost the career of young researchers when they need it most. Thanks to the support of Cancer Research UK I was able to start a new project looking at the contribution of small molecules called microRNAs in promoting cancer progression in order to find novel targets for colon cancer treatment.”
Supporting clinical academic careers

Cancer Research UK works closely with other organisations to support research training in key areas, and to build clinical research capacity. We also provide mentoring and training for our fellows as they develop their careers.

Surgery research
We offer a joint Clinician Scientist Fellowship scheme with the Royal College of Surgeons of England, to encourage surgeons to pursue an academic career. There are currently three joint fellows, Alex Mirnezami, Rakesh Heer, and Prabhakar Rajan. Although we did not fund any joint fellows in the most recent round, we aim to continue to appoint new joint fellows next year.

As a further boost to surgery research, in 2011 we made a one-off investment of £1.2 million over three years to create eight new post-doctoral surgical research training positions at our Centres in Oxford, Cambridge, Southampton, UCL and Imperial College.

Radiology and radiotherapy research
Between 2005 and 2008 our joint Clinical Research Training Fellowship with the Royal College of Radiologists supported eight joint Fellows. Three of these fellows, Ferdia Gallagher, Geoff Higgins, and James O’Connor, have since been awarded Cancer Research UK Clinician Scientist Fellowships. Since 2009 the College has generously continued to support our research training through our Centre clinical training accounts.

Mentoring
We match each of our Clinician Scientists with a senior academic clinician mentor, with whom they meet several times a year. The mentor can offer confidential, unbiased advice on their career, and balancing their research with their clinical practice. We hope that these relationships will help our fellows on their way to becoming a successful clinical academics.

The Clinical Fellows’ Meeting
Cancer Research UK holds an annual Clinical Fellows’ Meeting, which brings together our Clinician Scientist Fellows, Clinical Research Training Fellows, senior academics and charity staff. The 2013 meeting was held on 5 December at the Royal Academy of Engineering. Attendees heard from successful senior clinical academics on research and clinical practice through talks, workshops and direct interaction. There was also a Cancer Research UK update from Professor Peter Johnson (Chief Clinician), and the keynote talk was from Professor Dame Anne Johnson.

Promoting clinical research careers
Cancer Research UK is keen to promote clinical research as a possible career, and our staff are involved in a range of activities to support clinical careers including university visits.