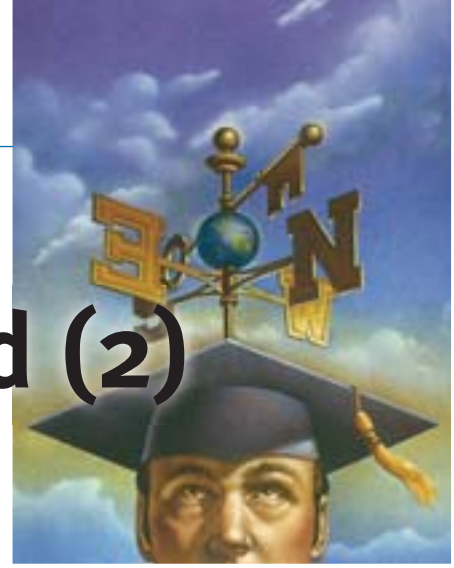

Career strategies for young European scientists (XIV)

Science by the Pound (2)

Our last issue offered a general overview of the UK's funding machinery and universities, followed by an introduction to the UK research councils. This time, we focus on how UK societies and charities fund biomedical research.

Many branches of UK science are associated with professional and learned societies that aim to foster and promote excellence by making use of public relations, policy making and research funding. In addition, the system of charities is highly developed in the UK, both in quality and quantity. Many societies as well as charities have significant amounts of cash at their disposal, either contributed by government or acquired by donations. As real alternatives to the funding provided by the UK research councils you will find many highly diverse opportunities to start or to fast-track your scientific career.

The Royal Society

The Royal Society of London for the Improvement of Natural Knowledge, or just the Royal Society (RS), claims to be the oldest learned society in the world and has been in continual operation since 1660. At its core are 1,400 fellows and foreign members, elected for life by peer review. Its activities, which are funded to a large extent by a science budget allocation of £44 million, are not limited to the UK and the Commonwealth. Around three quarters of its budget is used to support about 1,600 researchers at postdoc level and above with grants and fellowships. In addition, the Royal Society recognises excellence by offering medals, prizes and honorary lectures. Almost one-third of supported researchers are overseas scientists moving to the UK. Described below are three fellowships that are open to European or international researchers, providing your salary and additional cash for research expenses.

The *Newton International Fellowship* is a novel funding scheme, which was introduced this year by the Royal Society together with the British Academy and the Royal Academy of Engineering. It aims to bring in early-stage postdocs from all over the world and is open to all of the disciplines represented by the three academies. You must not have UK citizenship or be working in the UK at the time of application. At the start of the fellowship you should have a completed PhD and have had no more than six years of postdoctoral experience. A £24,000 annual salary is allowed for subsistence costs, plus £8,000 per year for research expenses and £2,000 for relocation expenses. The host institution receives 50% of the total award as a contribution towards their overheads. After the two-year fellowship ends and you are back home, the Royal Society will not abandon you. In the following decade you can receive up to £6,000 annually for networking activities with UK researchers. You apply with a specific research project together with your UK sponsor, who is an established researcher, with at least postdoc status, and is employed for the whole duration of your project. The second deadline for this fellowship is 15th January 2009. About 50 fellowships are expected to be available each year.

The *University Research Fellowship* is the major funding tool of the Royal Society. There are currently 310 fellows and about 35 newbies are selected each year. There is no age limit but you should be at the early to mid-stage of your career. According to the Society, this means that you have already mastered your first, second or third postdoc. The fellowship is for scientists from the natural sciences (including medicine, mathematics, agriculture and engineering sciences) who are close to becoming established as independent researchers. To apply, you need a PhD or equivalent experience and must have some ties with Europe (which under the definition of the Society includes the EU member countries plus Iceland, Norway, Liechtenstein and Switzerland). Ties mean either citizenship or another relevant connection, such as receiving your PhD or having worked for at least two years in these countries. Scientists with permanent positions in these countries, including the UK, must not apply. Funding is provided for five years, initially. Under certain circumstances the fellowship may be extended for three more years and a further extension to the maximum length of ten years is possible. It covers 80% of your salary, estates and indirect costs, the rest being provided by your host institution via governmental sources. In addition, in the first year €13,000, and thereafter about €11,000 annually, are paid for research expenses, but the actual amount is not guaranteed and is dependent upon the available budget. The money has to be spent at a UK university or non-profit research organisation (not at Research Council Institutes). The average success rate is about 5%. The next deadline is expected to be in October 2009.

The *Dorothy Hodgkin Fellowship* is named after Dorothy Crowfoot Hodgkin, a pioneer in the field of X-ray crystallography and Nobel Prize winner in chemistry. There are about ten of these fellowships awarded

each year and they target early researchers with one or two postdoctoral appointments under their belts. Women are encouraged to apply under this scheme. You may work part-time, claim additional funds for family support and participate in a mentoring scheme with other Dorothy Hodgkin fellows. The eligibility criteria and amount of funding are comparable to those of University Fellowships. Dorothy Hodgkin Fellowships are limited to a maximum length of four years. In 2008 there were 239 applications and 12 out of 53 short-listed applicants were selected. The next deadline for applications is in January 2009.

Charities

Many UK charities are involved in the promotion of biomedical research and provide about one-third of public expenditure on medical and health research in the UK. Besides the Wellcome Trust and Cancer Research UK, both introduced below, the Arthritis Research Campaign and the British Heart Foundation are amongst to the top UK medical charities. More than 100 medical charities are members of the Association of Medical Research Charities (AMRC) and spent about £800 million last year. Over a third of the money from medical charities is for cancer research, one tenth for cardiovascular diseases and 3% for arthritis research. The AMCR web site also provides a list of member profiles, where details of funding schemes and awards, restrictions to do with nationality and application processes, as well as details of the peer review system, research strategy and annual funding expenses are available. This site is a fine starting point for exploring additional funding avenues, especially if you do disease-related biomedical research as a basic or clinical researcher.

Wellcome Trust

The Wellcome Trust was established in 1936 as an independent charity with the aim to "improve human and animal health by the promotion of biomedical research". The financial foundation of the trust was the fortune of the late pharmaceutical tycoon Sir Henry Wellcome. After the Bill and Melinda Gates foundation it is, with an endowment of approximately £15 billion, the second largest foundation in the world. Early in 2008, the Wellcome Trust announced that research funding expenses were to be increased from £500 to £800 million per year.

In 1992, the ever-expanding Wellcome Trust Genome Campus was established in Hinxton, south of Cambridge. Today, the campus is home to the Wellcome Trust Sanger Institute, the EMBL's European Bioinformatics Institute (EMBL-EBI) and the Medical Research Council's Rosalind Franklin Centre for Genomics Research, making it a hotspot for genomic and bioinformatics research. In 2005, the Wellcome Trust committed itself to investing more than £340 million in the Sanger Institute over the next five years. Research is performed in four areas: human genetics, mouse and zebrafish genetics, host/pathogen genetics and computational genomics. The faculty comprises 35 scientists from junior to principal investigator, all receiving a salary and core support. Moreover, the Sanger Institute provides additional competitive postdoctoral and career development fellowships from its core funding. Contact the individual principal investigators for more information.

The Wellcome Trust also supports nine Wellcome Trust Centres, internationally recognised centres of excellence that receive core funding from the Trust. Clinical Research Facilities are a unique network of UK centres for experimental medicine and are funded by a consortium of governmental departments and charities led by the Wellcome Trust. The Clinical Research Facilities aim to speed up the translation of scientific findings into real benefits for patients by providing significant opportunities for basic scientists to work more closely with clinical researchers.

The science funding machinery of the Wellcome Trust is organised into five divisions, or streams: Immunology and Infectious Diseases; Populations and Public Health; Neuroscience and Mental Health; Physiological Sciences; and Molecules, Genes and Cells. If not otherwise specified in the call for your fellowship or grant you have to apply to the stream that represents the primary area of your research project. The funding committees, consisting of independent scientists, make decisions on grant applications, shortlist fellowship awardees for interviews and consult other committees that interview the shortlisted fellowship candidates and make decisions on awards.

The Trust supports more than 4,000 researchers and fellows in the UK and abroad. Approximately 10% of its research money is spent overseas. Funding is provided via 5-year programme grants of up to £1,2 million for internationally competitive research, 3-year grants in the range of £150k to £300k and fellowships. You can also apply for a *Sir Henry Wellcome Postdoc Fellowship*, launched in 2006, if you are a PhD student in your final year or have less than one year of postdoctoral experience. You have to be a citizen of the UK or the European economic area. If not, you need to have a degree awarded by a university in the UK or Republic of Ireland (ROI) or have been working continuously for at least three years in a UK or ROI institution. You apply with a research project of high biomedical relevance and as host country you may choose the UK or any other country. You need an administrative sponsor from the UK, a research sponsor (to guarantee that you have lab space and resources available for the project) and a mentor (providing independent support during your project). The fellowship is for four years and totals £250,000 for your salary and research expenses for consumables, animals, travel, attendance at scientific meetings and small items of equipment. Your basic salary is determined by your host institution but basic science fellows receive an annual salary enhancement of £2,500 from the Trust. Funds for major equipment and additional support personnel are not provided. Applicants send in a preliminary application, which is evaluated within three weeks of the submission deadline. Upon positive evaluation you are invited to deliver a full proposal. The final evaluation hurdle is an interview at the offices of the Wellcome Trust in London. The submission deadline for your short application is 3rd November 2009. On average, over 200 preliminary applications are submitted. If you are unsuccessful, resubmission is denied. Up to 20 new fellowships are provided each year.

Research Career Development Fellowships in Basic Biomedical Sciences provide the opportunity for postdoctoral scientists to become independent. The 5-year fellowship includes a basic salary with an additional Wellcome Trust enhancement of £7,500 per annum, research

expenses including a salary for research assistance (e.g. a technician), overseas allowances where appropriate, and travel and subsistence allowances for visits of up to one year. The fellowship provides on average between £500k and £1,000k. To apply, you need to have a connection with the European Economic area, as described above for the *Sir Henry Wellcome Fellowships*, and between three and six years of postdoctoral experience. You must have a sponsoring host institution in the UK or Republic of Ireland and a sponsor who guarantees lab space and resources for the duration of the fellowship. You are expected not to have spent more than two years at the department or with the sponsor, if applying for the fellowship in the same location. The full application process encompasses a short application, full application and interview. By the time you read this the 2008 deadline for short applications will have already passed on September 25th. The number of fellowships awarded each year has ranged in the past from 14 to 26 with more than 200 preliminary applications.

There are too many funding schemes for national and international scientists provided by the Wellcome Trust to be covered in this article. Scan their web site and you are sure to find something of interest. But be aware that the chances of success are between 5 and 10%.

Cancer Research UK

Cancer Research UK is the largest single independent funder of cancer research in Europe. It was launched in 2002 by the merger of the Cancer Research Campaign and the Imperial Cancer Research Fund. It is almost exclusively funded by public donations. The £333 million spent on research last year supported 4,250 scientists, doctors and nurses. A couple of research institutes are directly supported by core funding, such as the Beatson Institute for Cancer Research in Glasgow, The Cambridge Research Institute, The London Research Institute and the Paterson Institute for Cancer Research in Manchester. Other institutes are supported by renewable programme grants with significant core elements such as the Gray Cancer Institute, the Institute of Cancer Research in London and the Wellcome/Cancer Research UK Institute in Cambridge. Cancer Research UK employs its own scientists and also supports other researchers at UK universities, hospitals and research institutes. Funding details, such as application numbers and success rates, remain

Interview

"I feel fully integrated as a German"

Holger Gerhardt is Junior Group Leader at Cancer Research UK's London Research Institute (LRI). He received his PhD from the University of Tübingen, Germany. His postdoctoral work in Sweden was funded by an EMBO fellowship. In 2007, he became an EMBO Young Investigator and in 2008 was awarded the prestigious Lister Institute Research Prize Fellowship. His research is focusing on vascular patterning during development and disease.

When did you start at the LRI and how difficult was it for you to get funding?

Gerhardt: I joined the LRI as a junior group leader in August 2004. We are currently 46 junior and senior group leaders at the LRI with no departmental structure. All group leaders enjoy full independence. Regarding funding, I can only speak for the particular situation at our institute, which differs substantially from elsewhere in the UK. The LRI is the flagship basic science institute of Cancer Research UK. As such, we are fully core funded and new group leaders do not necessarily require additional funding from elsewhere, giving us full freedom to focus on our research projects. Given that funding agencies take into account the overall quality of the host institute, our reputation as one of the world's leading research institutes represents an additional advantage when applying for funding or when recruiting students and postdocs. The latter is, in my opinion, at least as important for a young group leader as is the acquisition of adequate funding.

What are the career perspectives for young scientists at LRI?

Gerhardt:When I was recruited, I enrolled on a tenure track with a fixed six-year contract with tenure evaluation scheduled for the fifth year. Currently, new junior faculty receives a seven-year contract with tenure review during the sixth year. Tenured group leaders are reviewed every five years with the help of external expert review committees. I received a generous start-up package including full lab equipment, one scientific officer, one postdoc position and one student and consumables. Since my work relies heavily on mouse transgenics, I am fortunate to have all my animal husbandry costs covered by the LRI as well. Additional postdoc positions are available in the form of competitive fellowships at our institute. In addition, group leaders benefit from a wide range of in-house research services. Since all our students are affiliated with University College London (UCL), group leaders are awarded honorary positions at UCL for the purpose of PhD supervision and PhD examinations. We have no teaching obligations.

Is it easy for foreigners to become integrated into the scientific community and its social life?

Gerhardt: I feel fully integrated as a German; our institute is very international with scientists from all over the world present at all career levels. We have a sizeable fraction of German scientists including six group leaders. Beyond our institute, the entire UK science community appears to be very international. The British people, in general, and the Londoners, in particular, surprised me with their easy going attitude and their openness towards foreigners. We rapidly made friends, and my wife and kids already feel thoroughly rooted in this society.

Having mentioned all the positive aspects, there is one special problem for foreigners: the housing market. Scientists moving to London will need to 'get a foot on the property ladder'. Renting is absurdly expensive and buying property just the same. Now that we have the credit crunch on top of this, with banks reluctant to offer mortgages, it is increasingly difficult to support a family and have an acceptable standard of living as a scientist in the UK. Top scientists at top institutes should be able to negotiate a salary that will compensate sufficiently for this difficulty, but it should be noted that this is one of the few downsides of London.

What steps are necessary to improve the funding situation and quality of science in the UK?

unavailable, despite several requests from *Lab Times*. Three funding schemes for non-clinical scientists and their independent research are introduced below.

Career Development Fellowships support non-clinical scientists at the start of their independent career and provide the opportunity to set up an independent research group for the first time. Upon application you should have between three and six years experience as a postdoc. The fellowship will be awarded for six years with a mid-term evaluation and is comprised of salaries for you, a postdoc and a technician, and money for consumables and equipment. The fellowships are not given to scientists planning to work in one of the Cancer Research UK core funded institutes, such as the London Research Institute. The application process takes about nine months and includes a preliminary application, a full application and finally an interview. Watch out for the next deadline in 2009.

Senior Career Research Fellowships support non-clinical scientists wishing to establish or consolidate their independent research group. Applicants should have a strong publication record and between six and ten years of experience as postdoc. Anyone who has been a group leader for more than six years at the time of application will be rejected. Cancer Research UK urges all potential applicants to contact them before sending in an application, since not all host institutions are acceptable. The fellowship will be awarded for six years and will comprise of salaries for you, two postdocs, a PhD student and a technician, consumables and equipment costs. The host institution is expected to demonstrate its commitment by providing a lectureship or other tenured post during or at the time of end of the fellowship. As for the Career Development Fellowship, some local restrictions apply. The application process takes about nine months and includes a preliminary application, a full application and an interview. The next deadline will be in 2009.

Career Establishment Awards provide five years of funding to new, non-clinical investigators who have just started their first job funded by the Higher Education Funding Council. The purpose of this award is to encourage investigators with interests in biomedical sciences (including biology, chemistry, physics and mathematics) to begin a career in cancer research by establishing their own research groups. Applicants may not use any part of the award to cover their own salary. They need a post at a UK university, must be a principal investigator and be within three years of their first academic post. The award is for providing funds for one junior postdoc position and one research assistant or technician, as well as running expenses, which may include a supplement for the applicant's own bench costs. You may also request equipment funding of up to £25,000 and animal costs. Up to eight awards are made per year. In addition, you may apply for the use of microarray technology provided by Cancer Research UK institutes. The next deadline for applications is 8th February 2009.

UK Internet Resources

- The Royal Society – *http://royalsociety.org*
- Newton International Fellowships – *www.newtonfellowships.org*
- Association of Medical Research Charities – *www.amrc.org.uk*
- Wellcome Trust – *www.wellcome.ac.uk*
- Cancer Research UK – *www.cancerresearchuk.org/*
- The Lister Institute of Preventive Medicine – *www.lister-institute.org.uk*
- UK Research Funding Finder – *www.hero.ac.uk*
- Biomedical Funding Sources – *www.guidestar.org.uk / www.funderfinder.org.uk*

Outlook

We have covered only a very few of the most prominent examples of fellowships and independent groups. There are many more at the local and regional level and one of the smaller charities might fit your needs. Also not covered were awards or prizes that might be used for the same purpose. As an additional example, consider the *Lister Research Prize Fellowship*. It is a one-off award of £200,000 to individual scientists and may be spent over five years in a very flexible way. It covers research-related expenses with the exception of your own salary. Scientists of any nationality with three to ten years postdoctoral experience may apply. The bulk of the project has to be undertaken in the UK but the money is transferable between different UK institutions. Up to eight short-listed candidates will be invited for interview and three to four fellowships made each year. The next deadline is 5th December 2008.

As we have shown, there are simply countless opportunities for starting an independent career in the UK. The UK is trying to attract the best international talent available in order to consolidate its leading position among the top three nations in biomedical research. The downside of this strategy is that the competition for some of the more prestigious positions, fellowships and grants is quite fierce. The chances of getting a tenure-track or a permanent position are slowly improving, but at the same time there is an increasing demand for postdoctoral scientists and the overall number of scientists applying for such positions is on the rise. If you have the potential to work successfully in a highly competitive environment, you should definitely take advantage of the opportunities offered by the UK science and research system. RALF SCHRECK

Gerhardt: The quality of science in the UK is high, but it requires continued efforts to attract the top people. The funding agencies need to keep a good part of their portfolio placed on basic science, against the worldwide trend to call for translational research. The UK has very strict rules on animal research. While it is very important to regulate the use of animals in science, the agencies in charge need to do more to make sure that the application for licences are dealt with rapidly and efficiently. The UK system does work, and I have been able to complete my research projects, despite difficulties, but my feeling is that scientists relying on animal models in other countries, including Germany, can gain a competitive advantage with no compromise on animal welfare.

What is the impact of the Lister Fellowship?

Gerhardt: The Prize brings financial benefits because of the extremely flexible funding. Outside funding always means additional independence, financially and mentally. The recognition and strong support by an external expert committee such as the Lister Prize committee is particularly valuable for young scientists. An additional benefit was the effect on my lab members. My students and post-docs realise that their work is greatly valued. If we continue to do well, the Lister Prize should also make it easier to secure additional funding.

INTERVIEW: RALF SCHRECK