A phenomenal legacy
Developing the London 2012 anti-doping centre for future research

Weapons of mass reduction
Dr Susan Jebb on the future of obesity research

Regeneration: taking stock
Stem cell pioneer Ian Wilmut on regenerative medicine’s past, present and future
The MRC is involved in one of the most exciting legacy projects to emerge from London 2012: a £10m research resource which will harness the sophisticated technology used to test Olympic athletes for drugs.

The GSK London 2012 Anti-Doping Science Centre in Harlow is now being developed into the MRC-NIHR Phenome Centre, which will use the Games facilities to help develop better and more targeted treatments for patients.

This is the first centre of its kind in the world, and will enable researchers to explore the characteristics of disease in order to develop new drugs.

A phenotype describes all the observable characteristics of a person that are the result of their genetics and their lifestyle, including physiology, behaviour and body chemistry. The MRC-NIHR Phenome Centre will allow scientists to study the mixture of molecules in blood, urine and tissues, from patients and volunteers from longitudinal studies. This mixture of molecules is changing all the time and is influenced by factors such as diet, environment and even stress levels. It is linked to how a person responds to disease or to treatments such as drugs.

The new centre will be run by Imperial College London and King’s College London. Dr Frank Kelly, a principle investigator at the centre from King’s, explained: “To do this, we need a biological sample from them — usually blood or urine and sometimes hair or nails. We then use techniques called nuclear magnetic resonance spectroscopy and mass spectrometry to accurately detect and measure the molecules present in the samples. The GSK London 2012 Anti-Doping Science Centre has robotic analytical facilities, hosted by GlaxoSmithKline, that can run almost unattended, 24 hours a day, and process the huge number of samples that we will need.”

This research will aid the discovery of new biomarkers to explain why one individual or population may be more susceptible to a disease than another, helping scientists to find new, safer and more targeted treatments.

The centre will be funded over five years by an investment of £5 million by GlaxoSmithKline, that can run almost unattended, 24 hours a day, and process the huge number of samples that we will need.”

Read the full interview with Dr Kelly on the MRC’s new blog: www.insight.mrc.ac.uk
Sharing mice to speed ageing research

UK scientists studying the biology of ageing are to benefit from a new resource to share tissues and make the most of every mouse bred for ageing research, thereby reducing the numbers of animals required and saving money.

Shared Ageing Research Models (ShARM UK), which is funded by the Wellcome Trust and supported by the MRC, will combine web-based information systems with a mouse tissue bank. It was established by scientists from the MRC-Arthritis Research UK Centre for Integrated Research into Musculoskeletal Ageing and MRC Harwell.

Because the genes and tissues of mice are very similar to our own, mouse models are important for ageing research. But housing and looking after mice over a long period is costly and has a knock-on effect for the development of new projects. Scientists are often only able to use one or two tissues from a mouse, with surplus tissues being discarded. This has ethical, economic and scientific shortcomings.

Details of live ageing mouse colonies across the UK from which investigators are willing to release surplus tissues will be held on a database, allowing scientists to see immediately what kind of tissue is available for research. ShARM will act as a ‘match-making’ service putting colony holders in touch with researchers. Surplus tissues will also be flash-frozen and donated to a biorepository, available to the research community.

An online collaborative environment (MiCEPACE) will also be set up to help scientists share knowledge and experience on the care and welfare of ageing mice.

Dr Mark Prescott, Head of Research Management and Communications at the National Centre for the Replacement, Refinement and Reduction of Animals in Research (NC3Rs), said: “ShARM has the potential to contribute to the reduction and refinement, as well as the speed and cost-effectiveness, of research into ageing. Banking and sharing of tissues will help make maximum use of each animal. Plus the online network can be used to share information on best practice in the care, use and welfare of aged mice.”

For more information visit www.SHARMUK.org

Fighting global bacterial infections

Bacterial infections cause a huge burden of disease across the world and kill many millions of people and animals — causing pneumonia, diarrhoea, meningitis, gastrointestinal and bloodstream infections and many of the infections acquired in hospitals. Bacterial resistance to antibiotics is now widespread and increasing at an alarming rate.

The MRC Centre for Molecular Bacteriology and Infection will use multi-disciplinary approaches and sophisticated techniques to study bacterial infections at atomic, cellular and whole-organism levels. Its aim will be to find ways of developing new antibiotics combating antibiotic resistance and developing effective vaccines. The centre will span Imperial’s Department of Life Sciences and its Department of Medicine.

Training of both young academics and clinically qualified researchers in bacterial pathogenesis will be a specialism of the centre, to address the current shortage of UK-trained expertise in the field. Imperial is contributing funding for six new lectureship posts at the centre.

Professor David Holdeman, from the Department of Medicine at Imperial College London and Director of the new centre, said: “Although bacterial infections continue to cause immense human suffering and mortality throughout the world, recent advances – particularly in genomic, biochemical and imaging techniques – have enabled rapid progress to be made in understanding how bacteria cause disease at the molecular level. This new centre will be equipped with state-of-the-art facilities to help drive this work, and we expect that the insights gained will help in the rational design of new vaccines and antibacterial drugs, which we badly need.”

Setting high standards

New guidance on best research practice is now available on the MRC’s website, setting out the high standards that all MRC-supported research is expected to meet.

The document, prepared after consultation with researchers, sets out the MRC’s expectations in the form of principles, guidelines and standards to foster good research practice in all MRC-funded science. It updates the MRC’s previous guidance published in 2003.

Good research practice is critical to high quality science, supporting the evidence base needed to drive improvements in health and delivering assurance to those whose work builds on the findings of others. It also provides strong foundations for research careers, supporting high quality education and training.

Dr Frances Rawle, the MRC’s Head of Corporate Governance & Policy, explains: “We expect all MRC-funded research to be conducted to the highest levels of integrity, clarity and good management and to exacting ethical standards. This document is aimed primarily at MRC-funded scientists, who must adhere to the guidance, but we hope that it will also be of use to the whole research community.”

Download the document at: www.mrc.ac.uk/Newspublications/Publications/Ethicsandguidance
Royal Mail chief to chair MRC

Donald Brydon CBE has been appointed as the next Chair of the MRC, initially for a four-year term.

Mr Brydon is currently Chairman of the Royal Mail Group and Smiths Group and his previous roles have included Chief Executive of AXA Investment Managers and Chairman of Amersham plc.

Current MRC Chairman Sir John Chisholm, who hands over the baton on 1 October 2012, said: “Donald Brydon is a man who has filled the Chair with great distinction in a number of first class organisations and he joins the MRC at a time when the opportunities to deliver results from the UK’s world-leading medical science have never been greater. I thoroughly welcome his appointment.”

See opposite page to read about Sir John’s departure.

Making an impact

Stories of some of the most interesting and important MRC-funded discoveries from the last year feature in this year’s MRC Annual Review, which will be launched in October.

The MRC Annual Review 2011/12: Advancing medicine, changing lives, looks at the impact of MRC-funded research on health, the economy and society.

We hear from Dr Cari Fee, a public health researcher in London who with MRC funding, has developed a mobile phone support service to help smokers to give up, which has now been adopted by the NHS.

And in Oxford, we tell the story of Professor Roger Patient, whose research may have uncovered a way to use stem cells to repair the damage inflicted by heart attacks.

Read about these exciting stories and many more in the Annual Review, which will be available on the MRC website and as an e-book for Kindle and iPad. Visit www.mrc.ac.uk/annualreview12 to download a copy.

An insight into the MRC

The MRC launched a new blog in June, MRC Insight, which aims to showcase life across the organisation.

The blog includes stories about people, events and medical research relevant to the work of the MRC. Visit the blog at www.insight.mrc.ac.uk

Royal opening for Scottish Centre for Regenerative Medicine

With the Princess Royal

Scientists, researchers and visitors at the opening of the new Scottish Centre for Regenerative Medicine in Edinburgh.

The Centre, which is the flagship facility for the MRC’s Centre for Regenerative Medicine, will focus on translating lab research into clinical treatments.

The facility will play a key role in the development of both cell and tissue therapies, with research in areas such as stem cell biology, tissue engineering and drug development.

Professor Sir John Bell, Director of the MRC Centre for Regenerative Medicine, said: “We are excited to welcome the Princess Royal to the new Scottish Centre for Regenerative Medicine — the first of its kind in the world. It is a significant step forward in the development of this pioneering field of medicine.”

Sir John Chisholm steps down as the MRC Chairman at the end of September, after six years at the helm of the MRC’s Council. He will be replaced by Donald Brydon CBE, currently Chairman of the Royal Mail Group and Smiths Group (see opposite).

To mark his final Council meeting in July, Sir John was presented with a unique gift: a set of goniometer heads mounted on to an old piece of teak windowsill from the MRC Laboratory of Molecular Biology (LMB). The gift was made by Steve Scotcher and Adam Fowle in the LMB’s mechanical workshop.

A goniometer is a scientific instrument which is used in X-ray crystallography to rotate a crystal to be analysed into a precise angular position, but it is also used in other areas of science, including engineering – Sir John’s own field.

Sir John started his career as a graduate apprentice with General Motors in the 1960s. By 2005, he had founded a start-up company, CAP Scientific Ltd, served as UK Managing Director of Sema Group plc and guided the commercial launch of the UK Defence Research Establishments as QinetiQ, also serving as its Chairman.

Of Sir John’s departure, MRC Chief Executive Sir John Savill said: “Sir John Chisholm has been an inspiration as Chair of the Council, constantly encouraging innovation and improvement in the ways the MRC delivers on its charter objectives.”

Crystal clear winners

Students from Laxton Junior School in Oundle – co-winners of this year’s MRC Laboratory of Molecular Biology (LMB) Crystal Growing Competition – on a visit to the LMB. Every year schools from all over the East of England compete to grow the best crystals of potash alum. The competition, sponsored by the LMB and the Cambridge Crystallographic Data Centre, aims to encourage a whole new generation of scientists.

See opposite page to read about Sir John’s departure.
The final step is to devise tests that can be carried out automatically by differences between healthy and diseased cells that cause the healthy person, preferably a relative, it's possible to identify the molecular iPS-produced neurons from a patient with equivalent cells from a (neurons) that are damaged in motor neuron disease. By comparing we can turn these iPS cells into other cells, for example the nerve cells possible to produce the large number of cells required for research.

In future we'll probably know even more about changing cells from one type to another so that it will become possible to produce exactly the type of cell that we need from a patient's own tissue. An alternative approach is to learn how to change cells from one type to another inside the body using drug-based treatments, rather than by cell therapy where cells are taken out, differentiated in the lab and then put back.

Regenerative medicine currently being undertaken by scientists. Very broadly, there are two main approaches at the moment. We're using stem cells to understand the mechanisms that cause some degenerative diseases so that it's possible then to identify drugs that are able to prevent the development of symptoms. The second strategy is to produce cells that can replace those that have died or ceased to function normally in degenerative diseases.

What benefits and insights might the first approach offer? To identify the molecular mechanisms that lead to disease it's important to be able to study cells that are affected by the disease in the lab. A key innovation that makes this possible is our ability to treat skin cells so that they are changed and become very similar to embryo stem cells. These cells — induced pluripotent stem cells, or iPS cells — are able to form all of the different cell types and grow in culture for very long periods. This makes it possible to produce the large number of cells required for research.

We can turn these iPS cells into other cells, for example the nerve cells (neurons) that are damaged in motor neuron disease. By comparing iPS-produced neurons from a patient with equivalent cells from a healthy person, preferably a relative, it's possible to identify the molecular differences between healthy and diseased cells that cause the disease symptoms.

The final step is to devise tests that can be carried out automatically by robots to identify compounds that are able to prevent the occurrence of the abnormal function, and therefore treat symptoms of the disease. Different groups worldwide are pursuing this approach in a search for treatments for diseases such as Parkinson's disease, some causes of heart failure, and multiple sclerosis.

How about the other strategy producing cells to replace damaged or faulty cells? This is a very challenging because the cells to be transplanted must be very pure and of exactly the required type. It's very encouraging that the initial trials of these so-called cell therapies are now beginning — for example, to treat stroke — and we can expect many more in the future.

Of course any potential therapies using iPS cells could be tested like any new drug treatments, and this process takes several years.

The UK is doing in terms of stem cell research? We're very competitive in the world, and we're very fortunate to have the support from funding bodies like the MRC, BBSRC, the Wellcome Trust and charities. We are very competitive in the UK and we have excellent support from our funding bodies. But we're also very fortunate to be working in a country with a supportive but robust legal framework for stem cell research.

We're approaching the most expensive phase for stem cell research now, so we will need ongoing support for this to continue.

Which approaches do you think will ultimately have the most therapeutic value? In future we'll probably know even more about changing cells from one type to another so that it will become possible to produce exactly the type of cell that we need from a patient's own tissue. An alternative approach is to learn how to change cells from one type to another inside the body using drug-based treatments, rather than by cell therapy where cells are taken out, differentiated in the lab and then put back.

Regeneration: Taking stock

In the third part of our series on regenerative medicine, Sarah Harrop spoke to stem cell pioneer Professor Sir Ian Wilmut about how far we've come and what the future might hold.

What are some of the different approaches to regenerative medicine currently being undertaken by scientists? Over the past 200 years we've learned how to control and treat most infections that used to kill thousands of people, many during the great plagues. We have new therapies, such as vaccines, to protect us from the rest of these viruses, such as in polio.

Today, most of these diseases are controllable. But we're not at the point where we can begin to treat the death or degeneration of cells which will have an impact on many diseases — multiple sclerosis, motor neuron disease, cardiovascular diseases. We are entering a new era. In 20 years we will have taken the first exciting steps, but it is important to recognise that it will take longer for regenerative medicine to reach maturity.
Large waist linked to diabetes risk in overweight adults

Overweight people with a large waist are just as likely to develop type 2 diabetes later in life as those who are obese, according to results from the largest international study of its kind to date. The research, which used data from the EU-funded InterAct Study, followed more than 340,000 people from eight European countries to examine their future risk of type 2 diabetes. Waist circumference was found to be strongly associated with type 2 diabetes, even after accounting for body mass index (BMI). This association was particularly pronounced in women.

Overweight men and women (BMI 25 to 29.9 kg/m²) with a large waist (over 102cm for men and over 88cm for women) were found to have a similar risk of developing diabetes as those who are clinically obese (BMI over 30).

Dr Claudia Langenberg from the MRC Epidemiology unit in Cambridge, who led the study, said: “We do not suggest replacing BMI as a core health indicator, but our results show that measuring waist size in overweight patients allows doctors to ‘zoom in’ on this large population group and identify those at highest risk of diabetes. These people can then be offered lifestyle advice, which can reduce their risk of developing the disease.”

Published online at: http://occmed.oxfordjournals.org, July 2012

Simple vaccination could save welders’ lives

MRC research has shown that welders and other workers exposed to metal fumes have a higher risk of dying from certain types of pneumonia, suggesting that they should be offered a simple life-saving vaccination.

A review of the evidence, led by Professor Keith Palmer at the MRC Lifecourse Epidemiology Unit at the University of Southampton, showed that welders were up to six times more likely to suffer from pneumoconiosis pneumonia. The research corroborates recent advice from the Department of Health that these workers should be offered the PPV23 vaccination, which costs around £30 per jab.

The disease tends to affect vulnerable patients such as babies and the elderly, so many welders and the healthcare professionals who care for them may be unaware that they are at more risk.

Professor Dame Valerie Beral, Director of the Cancer Epidemiology Unit at the University of Oxford and study co-author, said: “A one per cent reduction in BMI may seem small, but spread across the population of the UK that could mean about 10,000 fewer premature deaths per decade from obesity-related conditions, such as diabetes, heart disease and some cancers.”

Published online at: www.nature.com/ijo, July 2012

Breast is best for mothers too

A study of 740,000 post-menopausal UK women has revealed that those who breastfed their children have a lower body mass index (BMI) than those who did not, even decades after giving birth.

The MRC and Cancer Research UK-funded study found that both childbearing and breastfeeding had significant, but opposite, effects on long-term weight. The more children a woman had, the higher her BMI decades later. However, the average BMI was significantly lower in women who breastfed than in those who had not, regardless of how many children they had.

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Published online at: www.cell.com, May 2012

Repairing DNA copying errors

Scientists from the MRC Institute of Genetics and Molecular Medicine (MRC IGMM) at the University of Edinburgh have discovered an enzyme that corrects the most common mistake in mammalian DNA.

The mistake is the inclusion of individual bits of RNA within the DNA sequence, which the researchers found occurs more than a million times in each cell as it divides. The findings suggest the RNase H2 enzyme is central to an important DNA repair mechanism necessary to protect the human genome; if such mistakes are not corrected they can lead to cancer and other diseases.

Dr Andrew Jackson and Dr Martin Reijns made the discovery by chance while working on a rare childhood autoimmune disease known as Aicardi-Goutières syndrome, which is caused by mutations in the RNase H2 genes. It leads to inflammation of the brain soon after birth and can be fatal within the first few years of life.

When they removed one of the RNase H2 genes in mice they found that, without the enzyme, the developing mouse embryos accumulated more than 1,000,000 single embedded bits of RNA in the genome of every cell, resulting in instability of their DNA.

Published online at: www.cell.com, May 2012
It’s not often that you get to celebrate a 100th birthday while still being at the top of your game, but the MRC will be doing just that in 2013. Next year we’ll be celebrating a hundred years of life-changing discoveries and taking time to reflect on our many achievements in medical research, acknowledging those who have supported us along the way and looking forward to what medical research will deliver in the future.

It’s only right that we share our celebrations with the widest possible audience. That’s why we’re hooking up with the Science Museum in London to create several activities that will bring scientists and the public together to talk about medical research of the past, present and future. More details of all the events we’ve got planned will be available in the special centenary edition of Network, published in January 2013.

### MRC centenary installation

How does a medical research laboratory of 1913 compare with the high-tech, computer-driven facilities we work in today? What might a lab of the future look like? Find out at a unique installation at Imperial College London in April 2013, where the foyer will become a live lab complex. Explore your thoughts on the future of medical research alongside luminaries such as Sir Melvyn Bragg and Lord Robert Winston. The installation is co-curated by the MRC Clinical Sciences Centre.

### Science Museum

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### MRC achievements timeline

The MRC has made thousands of medical discoveries over the past 100 years and to highlight some of the very best we’re creating a special web-based timeline. The MRC Achievements Timeline will take you through a century of life-changing discoveries and via photographs, interviews and commentaries, showing how our research has had a lasting influence on healthcare and wellbeing in the UK and globally, right up to the present day.

### Medical research live

It’s not all test tubes and lab coats at the MRC. Many of our discoveries are based on observation, data collection and analysis. Why not contribute by taking part in one of our live online experiments? You’ll be able to access all our live experiments via the centenary section of the MRC website.

#### The great British sleep survey

Are you a lark or an owl? That is the question which underpins the BBC Lab UK Great British Sleep Survey, which aims to discover if there’s a relationship between sleep and age, lifestyle and other factors that affect our sleep patterns.

#### The great worm hunt

Contribute to a neuroscience study on brain circuitry by playing a video game based on how nematode worms lay their eggs. The Great Worm Hunt is part of a public/science collaboration involving scientists at the MRC Laboratory of Molecular Biology and the University of Oxford’s Galaxy Zoo team, which has recruited 250,000 members of the public to help classify galaxy images from the Hubble telescope.

#### A century of amplified music

How does leisure noise affect hearing? We already know that repetitive exposure to loud music can damage hearing, but the question is how loud and for how long? The interactive project, led by the MRC Institute of Hearing Research, aims to answer that question.

### Science open doors

Why not grab an invitation to one of our MRC open week events in June? More than 40 of our world-class research institutes, units and centres will be opening their doors to the public for one week only, providing lab tours and talks about their research as well as hands on activities and entertainment for all the family. Alternatively, look out for MRC centenary events, school visits and themed festivals near you.

Details will be on the centenary section of our website in spring 2013.

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MRC funded research continues to have a huge impact on health in the UK and worldwide and on our economy and society. Throughout 2013 MRC-funded research continues to have a huge impact on health in the UK and worldwide and on our economy and society. Throughout 2013
Professor Wiebke Arlt, an MRC-funded endocrinologist (hormone researcher) at the University of Birmingham, shows us around her office.

My WORK SPACE

Nappy
As part of my research we are developing new techniques for detecting endocrine disorders by analysing urine. Unlike adults, you can’t easily collect urine from babies over 24 hours, so we’ve worked out a way to extract urine from nappies. So every three months I get nappies in the post from my nephews, who are in the longitudinal study, and from the babies of colleagues and researchers. We can then compare the urine with that from children with endocrine disorders for research. Long term it could replace having to do blood tests. This nappy’s a clean one. I would add!

Statue
My colleagues and I got this trophy for coming in second to last place in the football competition for the Society for Endocrinology. That was the first year we finished second to last and not last!

Certificates
These are the major research awards I’ve got so far. I put these up on the wall because it’s good PR for people who come into the room so that they can see that Birmingham’s great for endocrinology. The Endocrine Society Oppenheimer prize is important because I was the first European to ever get this award; previously it was always given to Americans or Europeans who worked in the US.

Children’s drawings
These drawings are by godsons of mine. Obviously the two boys are very different. One is more of a sporty guy, so he imagines my work as being all about jumping into helicopters and flying off to save people. The other godson is more introspective and this is how he imagines me in the lab – there’s a kettle boiling and there’s me in front of the microscope and there’s test tubes and a human skull.

Jug
This is from Ikea. It’s a design classic – it’s already in the museum for modern design. It’s totally cool, it’s all one form and I really like it. They have it in all kinds of cool colours and thanks to this my plant survives, even with occasional watering.

Newspaper clipping
I was given this during Euro 2008 – the headline says “Germans show sudden creativity”! I’m German so it makes me laugh.

Conference badges
These are a shocking reminder of how many conferences I’ve been invited to give talks at – that’s a lot of air miles!

Read about Wiebke’s research in the 2011/12 MRC Annual Review, published on the MRC website on 1 October.

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New centres to put health records at the heart of research

To harness the unique value of NHS health records, an MRC-led consortium of UK government and charity funders has made an historic £19 million investment to establish four e-health research centres of excellence in the UK. Due to open in late 2012, they will be based in London, Manchester, Dundee and Swansea.

At each centre, scientists will carry out cutting-edge research that links e-health records with research and other forms of routinely collected data. By combining clinical, social and research information, the teams aim to identify more effective treatments, improve drug safety, assess risks to public health and study the causes of a wide range of conditions. They will also play a leading role in engaging with the public to promote better understanding of the field.

Professor Sir John Savill said: “This is a watershed moment for data research and for the MRC, which I believe will deliver the benefits of e-health research, improving patient care over the coming years.”

The four centres will make use of datasets available through the Clinical Practice Research Datalink, a £60 million service recently announced by the Department of Health, and the National Institute of Health Research. This service will link patient records from GP and hospital care, and enable scientists to access this information in an anonymised form.

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New open access policy for RCUK

Research Councils UK, the umbrella body for the UK research councils, launched its new policy on access to research outputs in July, to bring clarity and consistency to its requirements and funding arrangements for open access publishing.

The policy was informed by the recommendations of a working group, set up at the request of Science Minister David Willetts, to investigate the best way to expand access to publicly-funded research outputs.

To align the MRC’s existing open access policy, launched in 2006, with the new RCUK policy, three changes have been made:

• The policy now covers peer-reviewed conference proceedings in addition to primary research papers.
• The definition of open access has been extended to full use and re-use of documents published under the Creative Commons CC-BY licence where an open access fee has been paid.
• Funding for payment of open access fees will be provided through block grants to higher education institutes and ring-fenced within budgets for MRC units and institutes.

The policy means that researchers are able to re-use information contained in papers for purposes such as text-mining. Details of the funding model and its roll-out are being finalised.

Journals to provide access for all

Two new open access biomedical science journals – eLife and PeerJ – will be launched this year to make new research findings available for everyone.

Digital journal eLife opened for submissions in June and will be launched at the end of 2012, to publish high-quality research from the life science and biomedical sectors. Research results will be made freely and openly available in an accessible format. eLife will also act as a platform to increase the influence and reach of new research.

PeerJ, also set to launch later in 2012, will be structured on a membership model. Researchers will be asked to pay a flat membership fee for unlimited, unrestricted open access publishing. Users can also pay a smaller fee for a limited number of publications per year.

For more information visit www.e lifesc iences.org and www.peerj.com

Promoting the value of the data to policy-makers

NHS patient records are a globally unique resource for research. Linking them together can enable scientists to see disease patterns at a population level, assess the safety of drugs over long periods and uncover ways to predict who will develop a disease in the future.

In July, the MRC helped to organise the All-Party Parliamentary Group on Medical Research Summer Reception at the House of Commons which aimed to highlight the value of health data to MPs and peers, and explain what they can do to help scientists access this information safely and securely.

Speaking at the event, Sir John Savill described the wealth of datasets that exist in the UK. He said that a streamlined regulatory process coordinated by the Health Research Authority — the planned single regulator of health research — would ensure that health benefits gained from data-driven research are brought to patients as quickly as possible.

Sir John recently gave evidence to a review being led by Dame Fiona Calderott which is assessing the balance between protecting patient information and sharing it to improve care. This will also look at how researchers access health records and should help clarify how different types of data are handled. The Department of Health will respond to the review’s recommendations following its publication later in 2012.

The MRC has produced a booklet about the use of data in research in collaboration with the Academy of Medical Sciences, the Association of Medical Research Charities, Cancer Research UK and the Wellcome Trust. Download a copy at www.mrc.ac.uk/Utilities/Documentrecord/index.htm?d=MRC008772

Vital statistics

• Every hour, more than 150 research articles are published.
• In 2009 researchers produced enough data to fill a stack of DVDs reaching from the Earth to the Moon — and back again.
• An Ipsos MORI poll of nearly 1,000 adults in 2011 found that 80 per cent would like their doctor to offer them the opportunity to allow a researcher confidential access to their medical records with no other involvement from them.
• A 2011 Ipsos MORI poll of nearly 1,000 adults found that 72 per cent would like to be offered the chance to take part in research trials.

I’m as excited by science now as when I was 13.”

Wendy Ewart, MRC Director of Strategy and Deputy Chief Executive

My job is to draw out expertise and ideas from across the MRC and the wider scientific community and synthesise them into a research strategy. I lead that process, but actually it’s more like being a conductor – we make the channels to allow the very best ideas for new research to come through.

Career in brief

• PhD on the neuronal mechanisms underlying Parkinson’s disease.
• Group Leader and Senior Lecturer, Queen Mary University of London.
• Research management and strategy roles at the Wellcome Trust and Imperial College London.
• Career highlight: Working on the 2010 Government Spending Review to make the case for biomedical science funding in the UK.

I’m as excited by science now as when I was 13 and I read a book called The Chemistry of Life. I remember copying out the whole glycolysis pathway. I didn’t understand what the chemical symbols meant, but what really fascinated me was learning how sugar is converted into energy in the body. That’s why I made a transition for whatever degree would show me how the body worked, and that was physiology and biochemistry.

I was an academic for nearly 20 years but after two decades at the bench I felt I’d reached a natural point of completion in my research. I realised that what I really loved was the breadth of science, rather than just focusing on one area. For several years I was a scientific programme manager at the Wellcome Trust where I got to read scientists’ grant applications and hear about cutting-edge science. It was like being a child in a sweet shop for me.

Working across the breadth of science allows you to take different views, to gain perspective on the best opportunities across different fields of research. So I moved into research strategy and, after five years at Imperial College, I became MRC Director of Strategy in 2008.

I lead the management of MRC Strategy Board, which is composed of all the chairs of the MRC research boards and overview groups. We meet every six weeks to make big, complex or unusual funding decisions and thrash out how we can make an impact on biomedical research in the future.

My first task when I arrived at the MRC was to put together our Strategic Plan for 2009 to 2014 Research Changes Lives. That involved bringing people together to gather ideas and then stepping back to spot what the key themes were and how they might fit together into a compelling story about the MRC’s unique contribution to biomedical science. Presently we’re preparing for the next Spending Review, and refreshing our Strategic Plan as we’re now halfway through its lifespan. We’re galvanising activity, assessing our progress, and asking our brightest minds ‘what will MRC research look like in the future?’ The MRC has been around now for nearly a century, and I think we’ll still be here in 100 years because there will always be a need for excellent science.

Another part of my role is supporting our strategic planning and evaluation team, which measures the outcomes of MRC-funded research through our online data-gathering system, Researchfish (formerly MRC-eVal). It’s going fantastically well and is giving us a wealth of information about the far-reaching effects of MRC research. I also have responsibility for our international strategy team, which covers our work in global health trials, and looking after Research Councils UK’s offices in China and India.

What I most enjoy about my job is that it’s varied, fast-paced and I get the opportunity to interact with the whole UK biomedical research scene – the Department of Health, universities, charities and government.

There’s no typical day, but usually it will involve a lot of meetings. All the rest of my work has to be fitted in ‘around the edges’. Today, for example I’ve had back-to-back meetings from 10 til 4.30pm. It might sound a bit dry, but it’s quite the opposite because all those conversations relate to science.

When my day’s work is done I shall be going home to catch up with our youngest daughter, who has just returned from a year at university in Chile. Even though our children are now all grown up, the pressures of being a parent don’t go away because there’s still always something happening with one or other of them. Being a parent interacts with your working life no matter how old they are. I think the key to managing that balance has been that my husband and I have always divided the responsibilities of parenthood completely equally.

One of the highlights of my time here has been preparing our bid for the Government Spending Review of 2010, when everyone at the MRC pulled together to make a robust case for the role of biomedical science for the UK. That the science budget was protected at a time of great economic uncertainty is credit to the enormous value of our scientists’ work to both human health and the economy, and also to the efforts of the research community to communicate that value.
Investing in the brightest minds to celebrate 100 years

The MRC celebrates its centenary in 2013. To mark 100 years of achievements by MRC scientists, we have launched the MRC Centenary Awards to help our very best early career researchers accelerate their research and career development.

This could be through a bold move into a new area of research, developing capacity in a particular field or learning a new technology.

£11.1 million has been awarded to researchers in MRC units, centres and partner universities, and a further £2.8m has funded applications from other research organisations and MRC grant-holders and fellows.

Dr Christina Nelker, from the MRC Functional Genomics Unit in Oxford, has been awarded an award to develop facial recognition software for the diagnosis of rare genetic disorders which cause abnormal development of the head and face. Around 70 per cent of patients with suspected developmental disorders leave the clinic without a diagnosis or locating the genetic cause.

Development of robust software that can spot subtle similarities in facial features in different, unrelated people will help clinicians to diagnose these different disorders.

Another MRC fellow, Dr Sarah Gerver at Imperial College London, will undertake training in mathematical modelling and health economics to undertake training in mathematical modelling and health economics to understand how HIV infection is transmitted between people within particular communities. She hopes to extend the model to assess the possible impact of national screening programmes, male circumcision, or treatment as prevention, the findings of which could influence UK policy in HIV prevention.

Award holders have been asked to provide the MRC with an update of their achievements next summer. Watch out for updates in the Autumn 2013 edition of Network. You can also read a profile of one of the Centenary Award holders, Dr Alexandra Brand, on our blog: www.insight.mrc.ac.uk

UK Regenerative Medicine Platform (UKRMP)

The MRC, EPSRC and BBSRC have launched a £20m call for four to five UK Regenerative Medicine Platform (UKRMP) interdisciplinary hubs. The hubs will create UK centres of expertise with the necessary critical mass to address key regenerative medicine translational challenges through providing new tools, protocols and resources.

A second phase of the UKRMP, planned for 2013/14, will seek to exploit the hubs to deliver disease-specific programmes. An applicants workshop will take place on 21 September in London and the deadline for applications is 27 November. For more information visit www.ukrmp.org.uk

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China-UK stem cell projects funded

Knowledge gaps in stem cell research are being tackled with nine new funding awards under a collaboration between the MRC and the National Natural Science Foundation of China (NSFC), which also aims to improve collaborative links between scientists in the two countries.

Funded projects will investigate underlying biology and potential avenues for stem cell therapy for diseases including rheumatoid arthritis, amyotrophic lateral sclerosis, hepatitis B and C and vision disorders.

The financial support will establish small-scale projects to increase understanding of stem cell biology and carry out preliminary, pre-clinical studies to prepare the ground for future therapies. In the longer term the funding will lay the foundations for more substantive China-UK stem cell research programmes.

European funding opportunities

Grants of £3.5m for up to five years are available under the European Research Council’s final call for proposals for its Advanced Grants scheme.

Funded under the European Framework Programme (FP7), ERC Advanced Grants support top-flight investigators to pursue innovative high risk/ high gain research. The aim is to encourage innovative interdisciplinary research and pioneering frontier research projects.

Applicants must be scientifically independent and have a track record as a leader in their respective field, or fields, of research. Funding applications are expected to aim high, both in their scientific achievement ambitions and their creativity and originality of approach.

Professor Chris Ponting, Deputy Director of the MRC Functional Genomics Unit in Oxford, is two years into an Advanced Grant-funded research project to understand the evolution and function of RNA that does not code for proteins, which he calls ‘the exotica of our genome’. Chris and his team want to find out how important these genes are, whether they have an effect on coding genes, and how they contribute to the differences we see between species.

Chris explains: ‘My ERC Advanced Grant allowed me to take a risk to do something I’ve always wanted to do, which is to set up a wet lab alongside my computational lab. That’s allowing me to use both laboratory and computational approaches to investigate these exotica, these barely understood things in our genome which might yet be important.

A five-year grant means you can take risks, react quickly to developments in the field, recruit great early-career scientists and you can coalesce a large body of work around your ERC grant.

The deadline for applications is 22 November. Successful applicants’ research will be undertaken in their own research team and international collaboration is not part of the eligibility requirement. For more information, including how to apply, visit: http://erc.europa.eu/advanced-grants, or for help or guidance regarding ERC grants, contact the UK National Contact Point at erc-uk@bbsrc.ac.uk.

Further European funding opportunities are available under the ERCStarting Grants scheme for up-and-coming research leaders, with a deadline of 17 October. For more information visit http://erc.europa.eu/starting-grants

Calling new MRC Board and Panel members

The MRC is advertising for new members to serve from 1 April 2013 on all four of its research boards and several panels. The closing date for applications is 3 October 2012. For further details visit: www.mrc.ac.uk/Ourresearch/Boardpanels/groups/Vacancies

For the latest information on MRC funding opportunities, visit www.mrc.ac.uk/fundingopportunities
Seeking weapons of mass reduction

Obesity plagues societies worldwide and efforts to curb it are not making sufficient headway. MRC Human Nutrition Research’s Dr Susan Jebb says it’s time to take action and find affordable ways to tackle this ‘wicked problem’ at the population level.

A quarter of the adult population in the UK is clinically obese and a further third is overweight. Obesity is the leading cause of type 2 diabetes, the second greatest cause of cancer (after smoking) and causes a myriad of other health problems, from respiratory conditions to infertility, liver disease to osteoarthritis.

Public health policy to tackle obesity is rightly focused on preventing excess weight gain. But we cannot ignore the less extreme cases: the large numbers of overweight people for whom weight loss can bring personal health gains, with an associated reduction in healthcare costs to society. We need to step up our efforts to find new ‘weapons of mass reduction’.

In the last two decades we’ve seen tremendous efforts to treat obesity with drugs or surgery but these have tended to overshadow methods to tackle obesity which encourage and enable people to change their diet and activity habits. Yet changing these behaviours is the cornerstone of effective, long-term weight control.

For those at high risk, techniques designed to help people adopt a healthier diet and become more physically active can more than halve their chance of developing diabetes. But these intensive, individual courses of diet and become more physically active can more than halve their chance of developing diabetes. But these intensive, individual courses of diet and activity, which can vary from the rigours of these regimes, the weight loss is impressive and can even match that achieved through gastric band surgery. But presently data from well-controlled, large-scale trials in primary care are lacking.

There’s anecdotal evidence of successful slimmers who use a range of self-help techniques to control their weight. These people tend not to appear in clinical trials, which usually recruit from secondary or tertiary care clinics, and warrant further consideration.

Frustratingly, scientists and health professionals cannot be sure a technique to change behaviour will work for a particular individual. We can only stack the dice in favour of success by ensuring that the treatments on offer are effective and identify strategies that can help the greatest number of people to benefit from weight loss. Accordingly, we need to develop new approaches to change diet and activity habits at the population level and work out which approaches are the most helpful through clinical trials based in the community, and not just the laboratory. We can then pinpoint which approaches are the most helpful through clinical trials based in the community, and not just the laboratory. We can then pinpoint the characteristics of successful participants and use the information to inform individual choice.

Obesity is a ‘wicked problem’; a tangled web of genetic, metabolic, behavioural and cultural factors that foster and sustain excess weight gain and inhibit successful treatment. It’s time for research into affordable techniques to tackle obesity by changing the behaviour of whole populations. Behavioural interventions must shake off their Cinderella image and take centre-stage.

Dr Susan Jebb OBE is Head of Diet and Population Health at MRC Human Nutrition Research in Cambridge. Susan is the science advisor on obesity to the Department of Health and is also Chair of the Public Health Responsibility Deal Food Network.