Global stem cell policy forum
Discussion group paves way for international collaboration

A meeting designed to encourage scientists worldwide to share data and resources has laid the foundations for an international approach to stem cell research.

The informal meeting discussed the prospects that stem cell research offers for generating new insights into fundamental cell biology and development. Ultimately this could lead to new cell-based treatments designed to repair or replace tissues damaged through injury or degenerative disease.

The meeting, convened by the MRC in January, brought together leading research agencies from all over the world to discuss how they might work together to further stem cell research. A vital part of the success of any such enterprise will be to identify funding schemes that facilitate cross-national collaborations. The countries and agencies involved included:

- Medical Research Council, UK
- Israel Academy of Sciences and Humanities
- Canadian Institutes of Health Research
- National Institutes of Health, USA
- National University of Singapore
- Juvenile Diabetes Research Foundation
- National Health and Medical Research Council, Australia
- Academy of Finland
- Scientific Council for Medicine, Swedish Research Council

As a result of the meeting two expert working groups are being set up. The first will look at the requirements of stem cell research, for example the need for well characterised, stable stem cell lines that reproduce predictably. The second group will consider how best to further discussion of ethical issues specific to different countries.

Speaking at the conference Professor Sir George Radda, MRC Chief Executive, said:

“This has been a constructive day for stem cell research and international scientific collaboration, laying the foundation for a global approach to cutting edge research”

“The agencies from around the world that met in London today recognise the long-term potential of stem cell research for human health, but are also aware of the concerns raised by new ethical challenges in this type of research”

Delegates will meet again in six months to review the progress of the working parties. Also on the agenda will be the issue of intellectual property rights. A website with information on stem cell research training opportunities is being created.
Stem cell research: banking on progress

The Medical Research Council has awarded a £2.6 million contract to set up a UK stem cell bank to the National Institute for Biological Standards and Control (NIBSC). The bank – which is one of the first of its kind in the world – will provide a vital resource centre to support progress towards realising the enormous potential of stem cell research to deliver major advances in treating a wide range of diseases.

The bank – which should be operational by mid 2003 – is a central plank of a national stem cell initiative being developed by the MRC, with the Department of Health, Human Fertilisation and Embryology Authority, Medicines Control Agency, other research councils and relevant charities. It will hold new and existing adult, fetal and embryonic stem cell lines, making them available to academic researchers and private companies from the UK and abroad. The MRC is meeting three quarters of the costs of the initial three year contract to establish the bank, and the Biotechnology and Biological Sciences Research Council are contributing a quarter share.

Progress with responsibility

MRC pioneered the establishment of the stem cell bank following the August 2000 Donaldson report, ‘Stem Cell Research: Medical Progress with Responsibility’. The report recommended that the research councils should look into setting up stem cell collections as part of a coordinated programme.

Outlining plans at an international conference held in September 2002 Dr Stephen Inglis, Director of NIBSC, said: “We’re looking forward… to working with the MRC and the scientific community to ensure that stem cell research is both facilitated and properly controlled”

Science Minister Lord Sainsbury, who also addressed the meeting, welcomed the contribution the bank would make to maintaining the UK as a world leader in stem cell research, and congratulated the MRC and the other bodies on their progress.

Standards and controls

The NIBSC award ensures that responsibility for the collection, storage and supply of ethically approved, quality controlled cell lines rests with a single, independent, national body. NIBSC conducts no in-house research on stem cells. However, it has a long history of working at the interface between science and medicine and substantial experience of working with cell lines and developing standards and controls for medicines, such as vaccines and blood products.

A new high level Steering Committee, chaired by Lord Patel, and including medical, legal and ethical experts, will oversee the bank’s activities, regulate the use of embryonic stem cell lines and develop codes of practice for the stem cell bank, and for the use of stem cell lines.

Improving efficiency

The UK stem cell bank will improve the efficiency of stem cell research within an ethical and regulatory framework. By using standardised high quality cell lines, known to have been ethically obtained, scientists will be able to make faster progress towards new stem cell based medicines. The existence of the bank will also help to avoid research being duplicated and reduce the numbers of embryos used. Information on all research projects performed with cell lines from the bank will be made public.

Stem cell statistics

- MRC spends around £7 million a year on research involving embryonic stem cells; most are from animals
- £0.5 million funds research using human embryonic stem cells
- 40 researchers work on adult human or animal stem cells
- Two principal investigators work on human embryonic stem cells
- Research is both clinical and basic, mostly into bone marrow/blood stem cells and nerve stem cells

Find out more
Visit www.nibsc.ac.uk/divisions/cbi/stemcell.html
Congratulations

Groundbreaking work on the genetic regulation of life and death has brought two of our scientists the world’s most sought after scientific prize….

The 2002 Nobel prize for physiology or medicine was awarded to MRC scientists Sir John Sulston, Dr Sydney Brenner and their former colleague Robert Horvitz for their pioneering work on the lowly nematode worm.

The work initiated by Brenner at the MRC Laboratory of Molecular Biology (LMB) in the 1960s paved the way to the sequencing of the human genome.

Brenner believed that the nematode worm, Caenorhabditis elegans, was capable of providing a simple model for the developmental processes underlying the life – and death – of more complex organisms, including humans.

Sulston, who joined the Cambridge lab in 1969, set about painstakingly mapping out the cell lineage of the worm, from embryo to adult. In an admirable feat of patience and dedication he eventually described the origin and lineage of all 959 adult worm cells in the early 1980s.

He also made the intriguing observation that 131 cells are destined to die as the worm develops. This programmed cell death is vital for an organism’s development and maintenance, and crucially, if it goes wrong, to the development of diseases such as cancer.

US scientist Horvitz built on Sulston’s work, discovering and characterising key genes controlling cell death and showing they had human counterparts.

“This work is expected to have a major impact on the understanding of human disease in the longer term”

Professor Sir George Radda

Research culture that breeds prizewinners

MRC network spoke to John Sulston on his return from the awards ceremony in Stockholm, where the King of Sweden bestowed the highest honour in science on him and his colleagues.

“The award is as much for the MRC and everyone I have worked with over the years as it is for my own personal achievement”

Sir John Sulston

When Sulston joined LMB he was aware of its Nobel track record, but never expected that one day his name would be added to the list of prizewinners.

He attributes LMB’s success to its unique research culture and MRC’s funding model of a block grant with post hoc review. The LMB ethos means that – then as now – everyone is encouraged to try out new ideas in a supportive and collaborative environment that is nevertheless intellectually competitive and rigorous.

This makes it easy to start projects based on sound science, without the pressure to meet short-term goals. Sulston thinks that this research style is more productive than trying to pick winners. Speaking to network he said:

“The whole point of research is that no one knows what you will find”

There is no better vindication of this approach than the scientific edifice that has risen from research into C. elegans. MRC-funded research on the genetics of the nematode during the 1980s was the precursor to the human genome project, proving that such an ambitious undertaking was feasible. Says Sulston,

“The human genome is built on the worm”

Today three decades of investment have paid off in the imminent completion of the human genome, an achievement which will bring medical benefits undreamed of at the start.

Sulston tells the story in his book The Common Thread, co-written with Georgina Ferry, in which he hopes to set the record straight on the origins of and race to sequence the human genome. See page 8 for details.
The UK Biobank project, the world’s largest, most comprehensive study of how genes and the environment influence health is now under way. The project — a collaboration between the MRC, Wellcome Trust, and Department of Health — will look at how genes and the environment contribute to the development of common yet serious illnesses like heart disease, diabetes and Alzheimer’s.

Work is currently in progress to establish organisational and management frameworks, draw up regulatory and ethical guidelines and develop scientific protocols.

Consultation counts

We have paved the way by seeking the views of members of the public, health professionals, scientists, and pressure groups to identify key concerns and priorities.

Of major importance is the need to ensure an ethically sound approach to the collection, storage and use of samples and data — including ownership of intellectual property and access rights.

Once frameworks have been established, an independent watchdog will be appointed to safeguard the interests of individuals taking part in the study. In the meantime a small interim advisory group — comprising independent experts in ethics, regulation and governance plus two members of the public — is being set up to advise on these issues.

Quality assurance

The UK Biobank project will be managed from a central coordinating centre, jointly owned by MRC and its partners and set up as a charitable company limited by guarantee. The centre will coordinate the activities of several regional sub-centres, which will recruit participants and collect initial data and samples. Custody of these will rest with the main centre as will responsibility for quality assurance, computing and financial management.

Bids are currently under evaluation and will be presented to a host selection committee in March.

Analyse this!

The UK Biobank project will involve some 500,000 middle aged UK citizens, who will be asked to donate a blood sample for DNA analysis, plus information about their lifestyle, diet and medical history. Their data will be analysed with the ultimate aim of developing more effective preventative medicine and treatments and improving the health of the nation.
50 years of the double helix

On 25th April 1953 James Watson and Francis Crick described the three dimensional molecular structure of DNA in the journal Nature. Their momentous discovery – the culmination of years of MRC-funded research by Watson and Crick in Cambridge, and Maurice Wilkins and Rosalind Franklin at Kings College, London – was one of the most significant landmarks of 20th century science.

To mark the 50th anniversary of the discovery of the structure of DNA and examine how it has shaped our world the MRC – with the Royal Society and Nature – is running a year-long programme of special events. Highlights include:

- **23rd April Celebration dinner**
  A senior government minister will address 400 guests from the worlds of science, industry, politics, media, and medicine

- **25th April Conference**
  ‘DNA: 50 years of the Double Helix’.
  To be held at the Laboratory of Molecular Biology (LMB) Cambridge. The event will be followed by a dinner at Jesus College
  For details visit www.cam.ac.uk/dna2003

- **26th April Symposium**
  For LMB alumni, guests and LMB members followed by dinner

- **11th-22nd April Edinburgh Science Festival**
  MRC’s exhibition stand will incorporate the DNA anniversary theme. There will be an associated event for local opinion formers and parliamentarians. ‘Life Is What You Make It’ – an MRC sponsored play about genetics – will be staged at the Festival

- **Max Perutz Essay Prize, 2003**
  There will be an additional DNA category in our annual essay competition. Look out for entry details on the MRC website.

- **Taking the message to schools**
  The MRC and Royal Society are launching a nationwide schools initiative. Plans include:
  - A forum and web-based debate for school children to discuss genetic research issues with scientists, bioethicists and philosophers
  - Hands-on science. Classes will make bacteria glow in UV light by adding a gene from bioluminescent jellyfish

- **Associated events**
  Over 60 organisations in the UK and abroad will run celebratory events throughout 2003.
  The Royal Mint has commissioned a special £2 anniversary coin, and Windfall Films are producing a TV series on the impact of DNA’s discovery.

**Find out more**

The celebrations are all about involvement, so if you would like to know more or join in please get in touch.

Visit: [www.DNA50.org.uk](http://www.DNA50.org.uk)

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**Government spending review 2002**

The MRC received a £38.6 million increase in baseline funding in the 2002 Government Spending Review. The money will allow us to increase available funding across MRC’s portfolio from 2004/05, and will bring the total science budget allocation for 2005/06 to around £450 million.

In addition, specific allocations will boost priority research areas and cross-Council programmes. These include:

- £26 million for stem cell research
- £9.7 million for brain science
- £6.25 million for genomics and £3.1 million for e-science, added to the 2000 funding which has rolled forward

The Government is also providing an extra £8 million to raise PhD stipend levels, and to encourage wider training of postgraduate and postdoctoral scientists. This will allow MRC to raise PhD stipends from the current £10,000 to £12,000 by 2005/06.

**Funding: 2002/03 award year**

- There will be 2 award points – March and July 2003
- Council will keep the financial position under review and make further announcements during the year
- For further information visit [www.mrc.ac.uk/index/funding/funding_principles.htm](http://www.mrc.ac.uk/index/funding/funding_principles.htm)
Wednesday's children

Adults who grow up in poor living conditions are more likely to die young than their less disadvantaged contemporaries. Research carried out by the MRC National Survey of Health and Development, followed 5,362 people born during a single week in 1946. Researchers found the risk of dying prematurely (between ages 26 and 54) to be twice as high amongst those who had experienced poor socioeconomic conditions as children, and three to five times higher if these conditions persisted into early adulthood.

BMJ 325,1076-80

False alarms?

Providing free smoke alarms to deprived households in inner city London boroughs doesn’t significantly reduce the incidence of fires or fire-related injuries. Despite a number of approaches designed to inform and help recipients, researchers found that few alarms were properly installed or maintained. A further study showed that even if they were correctly installed, only half were still working 15 months later. The authors conclude that distributing or installing free smoke alarms in poor multiethnic urban communities may be a waste of resources, unless better ways can be found to make sure that people use them properly.

BMJ 325, 979-980 & 995-1001

ART and science

The MRC has been asked to advise The Human Fertilisation and Embryology Authority on the scientific evidence of risks to children born through assisted reproduction techniques (ART). The request comes mainly because of concerns over the safety of intracytoplasmic sperm injection (ICSI). A working group, chaired by the Institute of Child Health’s Professor Catherine Peckham, was set up in summer 2002 to look at the broader area of ART including what is known from biological studies. The group, which includes consumer representatives, has met once so far, and will make recommendations after further meetings.

Find out more by visiting Topical Issues in the Public Interest section of the MRC website, or email corporate@headoffice.mrc.ac.uk

Screen saver

Ultrasound screening can halve death rates from abdominal aortic aneurysms (AAAs), potentially fatal balloon-like swellings in the wall of the main artery that runs from the heart through the abdomen. The Multi-centre Aneurysm Screening Study (MASS) studied 67,000 65-74 year old men at four hospitals in Southern England. Half the men were invited for screening, the other half were not. Scans detected 1333 AAAs and 65 linked deaths in the screened group compared to 113 AAA deaths in the non-screened men.

Lancet 360, 1531-39

A separate analysis of the same data, concluded that a national AAA ultrasound screening programme for older men would be cost effective.

BMJ 325, 1123-1124 & 1135-1138

All in the mind?

According to popular belief mental attitude can affect the chance of surviving cancer. However a review by Dr Mark Petticrew, Associate Director of MRC Social and Public Health Sciences Unit (SPHSU), suggests this is a myth. In an analysis of 26 studies investigating potential links between length of life and different ways of coping with cancer there was little convincing evidence to suggest that a ‘fighting spirit’ improved survival. Petticrew said: “People with cancer should not feel pressured into adopting particular coping styles to improve their chances of survival”.

BMJ 325,1066-9

New trial guidance

The latest addition to our Clinical Trials series – Cluster randomised trials (CRTs): methodological and ethical considerations – is now available. The booklet is designed to complement MRC guidelines for good clinical practice in clinical trials with advice particularly relevant to clinical research. It covers methodological, reporting, and ethical issues not generally encompassed by standard clinical trials guidance. Although aimed primarily at MRC supported researchers, other researchers, and those involved in reviewing research will find it helpful. The booklet provides clear, concise guidance, together with references and suggested further reading.

You can download the guidelines from the Clinical Trials pages in the Publications section of our website, or order a copy using the online publications order form.

Find out more...

For further news and highlights of our Clinical Trials see MRC Clinical Research News, Autumn 2002. You can download this from the Clinical Trials pages in the Publications section of our website, or order a copy using the online publications order form.
The art of science: a visual insight into MRC research

Crossing the boundaries

Dr Elizabeth Burns – or Lizzie as she prefers to be known – is not only a research scientist, she is also a talented artist. Drawing inspiration from the world of molecular and cellular biology she creates striking images that illustrate the invisible and dynamic processes fundamental to life.

Lizzie has been fascinated by biology and art since childhood. During her PhD and postdoctoral studies in cancer research at Oxford she found time to combine her interests, in a set of paintings inspired by subcellular biology.

The paintings have featured on the covers of scientific journals and books, but Lizzie’s artistic output doesn’t stop there. She is also an accomplished photographer and has had a play – ‘Autodestruct’ – about cancer, cloning and the ethics of human experimentation, performed at the Edinburgh Fringe Festival.

Medical Research Revealed

Lizzie’s latest project, ‘Medical Research Revealed,’ will be an exhibition featuring paintings, photographs, and interviews with MRC researchers. It was inspired by the MRC’s mission statement ‘to promote public engagement with medical research’. Her aim is to bridge what she sees as a widening gap between scientists and non-scientists.

She hopes the exhibition will depict the beauty of MRC-funded biomedical research, providing an insight into how science is done, and revealing what motivates the people behind it.

Lizzie is spending the next few months visiting MRC scientists throughout the UK to gather material and ideas. Her exhibition will be unveiled during the British Association Festival of Science in Salford this September.

The pictures illustrating this article were inspired by MRC Human Immunology Unit research. For exhibition previews and further information about Medical Research Revealed visit the Events section of the Public Interest pages at www.mrc.ac.uk
**Awards and prizes**

Sir John Sulston and Dr Sydney Brenner won the 2002 Nobel Prize for Physiology or Medicine, together with US scientist Robert Horvitz. Full story page 3.

**Other recent MRC successes include:**

- Professor Alan Fersht, Director of the MRC Centre for Protein Engineering, received a knighthood in the 2003 New Year’s Honours list for his work into the previously little understood world of protein folding.

- Nick Winterton, Executive Director of the MRC, was awarded an OBE for over three decades of administrative work in medical research.

- Professor Sir Philip Cohen won the 2002 Bristol-Myers Squibb Foundation Distinguished Achievement Award in Metabolic Research. Over the past 25 years Sir Philip has played a leading role in understanding how insulin acts in the body, suggesting new ways to develop drugs to treat insulin resistance in type II diabetes. Sir Philip is director of the MRC Protein Phosphorylation Unit (PPU) at Dundee University. He is the first non-American to win the $50,000 award.

- Dr Dario Alessi, a fellow researcher at PPU won a prestigious Leverhulme Trust award, worth £50,000. The award recognised his contributions to understanding mechanisms of cell signalling, a process involved in both cancer and diabetes. The achievement was the sixth high profile award of Dario’s career, and his fourth in 2002. The year also saw him elected to the Royal Society.

- Professor Annette Karmiloff-Smith won the 2002 European Latsis Prize for her outstanding contribution to the understanding of cognitive and language development in children with genetic disorders. She is the first Briton and only woman to have won the 100,000 Swiss franc (£68,000) prize, which is awarded by the European Science Foundation. Professor Karmiloff-Smith is Head of the MRC Neurocognitive Development Unit at the Institute of Child Health, University College London.

- Jon Rosier, an MRC PhD student, has been selected as a UK Advanced Scholar under the National Institutes of Health (NIH)/Cambridge University Health Sciences Scholar program. The scheme, launched in October 2002, allows students to spend time at each institution. Several NIH students have been to Cambridge, but Jon is the first British student to visit NIH.

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**Websites**

- The UK Biobank: a study of genes, environment and health now has a website. Visit [www.ukbiobank.ac.uk](http://www.ukbiobank.ac.uk)
- To find out how MRCT is working to make the most of MRC innovation and know-how, visit [www.mrctechnology.org/index.htm](http://www.mrctechnology.org/index.htm)
- Visit the web pages of the UK stem cell bank at NIBSC: [www.nibsc.ac.uk/divisions/cbi/stemcell.html](http://www.nibsc.ac.uk/divisions/cbi/stemcell.html)
- To keep up to date with local, national and international DNA structure 1953-2003 events, visit [www.DNA50.org.uk](http://www.DNA50.org.uk)

**Books**

- Designs for Life: Molecular Biology after World War II, by Soraya de Chadarevian, focuses on research at LMB in the post war era.
- Cambridge University Press £35 (hardback) ISBN 0 521 57078 6
- The Common Thread by John Sulston and Georgina Ferry.
- Bantam Press £17.99 ISBN 0 593 04801 6

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* Dumbleton Photography, Cambridge