The MRC and partnerships

John Savill
MRC Chief Executive

July 2013
MRC investment in research, 2012/13

MRC research expenditure - £766.9 million in 2012/13

- £343.1m for more than 400 programmes in MRC research units and institutes.

- £334.6m on more than 1,400 grants to researchers in universities, medical schools and research institutes.

- £71.3m on studentships and fellowships.

- London researchers were awarded £120m in grants and fellowships in 2012/13 (almost one third of the £373.3m total).
MRC mission

- Encourage and support high-quality research with the aim of improving human health.
- Produce skilled researchers.
- Advance and disseminate knowledge and technology to improve the quality of life and economic competitiveness in the UK and worldwide.
- Promote dialogue with the public about medical research.
Post-CSR10

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- Work with industry to drive economic development
Researchfish: collecting information about the outputs, outcomes and impacts of research

- In 2008 the MRC launched MRC e-Val, an online database for capturing output information.
- In 2011 we licensed the approach to Researchfish Ltd.
- Researchfish is now used by 80 organisations including the MRC, STFC, NIHR, CRUK and BHF. Once all organisations are set up it will capture the results of £3bn of investment in research each year.
- MRC has seven years of output data linked to 4,500 awards, provided by 3,500 researchers.
- We’ve collected 150,000 reports on outputs such as publications and patents, influences on policy, the development of new products and interventions, and the creation/growth of new businesses.
Economic benefits (data 2006-2012)

- **100** new products and interventions launched onto the market, and **600** in development.
- Creation or growth of **104** companies, which together employ at least **535** staff.
- **570** patents granted or published since 2006, with around **30%** licensed.
- MRC research groups are attracting **£100m** of additional funding from outside the UK each year and **£140m** from the charity sector each year.
- **1 in 3** MRC principal investigators have had productive interactions with industry since 2006.
- Income from commercial exploitation of MRC in the past decade: approx **£697m**
Magnetic Resonance Imaging
A new technology that has revolutionised medicine

1974-1980
MRI invented, research financed by MRC

1983
Magnetic Resonance Imaging (MRI) invented.

1986
Magnetic Resonance Imaging (MRI) invented, research financed by MRC.

1989
Oxford Instruments (Oxford University’s first spin-out in 1959) provides first superconducting magnets for MRI.

1990
British Technology Group licenses intellectual property from Oxford, Nottingham and Aberdeen Universities having built a strong patent portfolio.

1983
First MRI machine available in 1983, in clinical use in 1985

2003
Between 1986 and 1989 99% of the world’s MRI manufacturers were licensed including GE, Marconi, Siemens, Toshiba, Hitachi and Shimadzu, Bruker, Fonar and Esaote.

2010
20,000 MRI machines used world-wide, 60 million scans performed every year

Estimated £200m returned to Universities under royalty arrangements first with Johnson and Johnson, GE and then others.

US company GE buys Amersham Life Sciences for £5.7bn, increasing its base in the UK and securing medical diagnostic capabilities here

Nobel Prize awarded to Professor Peter Mansfield

Global MRI sales $4.5bn (2010)

Magnetic Resonance Imaging (MRT) associated industries estimated to add around £600m to UK GDP between 2011 and 2015

GE Healthcare has 30% of Global MRI market. GE UK sales (across all sectors £5bn, 19,000 employees – 1000 of which are at Amersham in medical diagnostics)

Oxford Instruments is a leader supplier of parts/servicing for MRI machines (has 1900 staff worldwide and joined the FTSE 250 in 2011, the company spends £29m on R&D and has a turnover of £330m)

Increased success in spinal surgery resulting from MRI is estimated to save the UK £166m each year in terms of working days

Improved limb salvage surgery estimated to save the NHS £5-10m per year.

Significant improvements in cancer therapy, for example breast and cervical cancer result from use of MRI


MRC | Medical Research Council
MRC partnerships with industry
Medical research attracts inward investment

2008: Pfizer set up a new $100m programme in regenerative medicine, part of which is collaborative with MRC-funded researchers at UCL.

2011: The MRC and AstraZeneca agree an entirely novel partnership to fund academic research on proprietary AZ compounds.

March 2012: GSK invest £500m and secure 1000 jobs in pharmaceutical manufacturing in the UK.

March 2013: AstraZeneca move 2,000 jobs from Cheshire to Cambridge and invests £330m in the new facility.

“...regards partnership in the UK, the quality of the science is fantastic” Ruth McKernan, Neusentis (Pfizer regenerative medicine) CEO

“Partnering across government, academia and industry is a critical way to spur additional scientific innovation” Martin Mackay, President of AstraZeneca Research & Development

“...medicines of the future will not only be discovered, but can also continue to be made here in Britain” Andrew Witty, GlaxoSmithKline CEO

“..allow us to tap into important bioscience hotspots” Pascal Soriot, AstraZeneca CEO
Employment in the Pharmaceutical sector is crucial to the UK economy

Gross Value Added (GVA) per employee for Medium and High Technology Manufacturing industries (£k)

- Pharmaceutical manufacturing jobs generate at least **twice** the GVA of other industries.
- UK pharmaceutical sector employs **70,000** people and generates a turnover of **£30bn**.
- The related medical technology and medical biotechnology sectors employ **96,000** people with an annual turnover of around **£20bn**.
Grant funding for industry partnerships

The MRC has a variety of funding schemes that encourage researchers to work more closely with industry.

- MRC/TSB Biomedical Catalyst
- Developmental Pathway Funding Scheme
- MRC Industry Collaboration Agreement (MICA)
- Translational Stem Cell Research Programme (TSCRP)
- Various training initiatives
Stratified Medicine Initiative

- Launched in December 2012.

- £60m initiative to develop disease-specific research consortia, involving industry partners.

- Consortia will explore mechanisms underpinning disease stratification, where there is evidence that therapeutically relevant strata exist.

- Focusing on inflammatory diseases, metabolic disease, some neurological diseases, infectious disease and cancer.

- Three consortia funded in December 2012: rheumatoid arthritis (£4.7m), hepatitis C (£3.9m) and Gaucher’s disease (£3m).

- A primary biliary cirrhosis consortium was funded in June 2013 (£6m).
Open innovation: MRC partnership with AstraZeneca

- Scheme allowing MRC funding for UK medical researchers to access 22 deprioritised AstraZeneca compounds.

- Researchers will use the compounds to understand disease mechanisms and explore treatment opportunities.

- 15 collaborative projects funded in October 2012.

- Research areas range from common illnesses to orphan diseases.

- The collaboration won the ‘Best Partnership Alliance’ award at the annual SCRIP Awards.
TSB/MRC Biomedical Catalyst

• A three-year, £180m programme managed jointly by the MRC and the Technology Strategy Board.

• Aims to support academic and industry scientists to move their research more quickly from **discovery to commercialisation**.

• Links to existing MRC translational programmes and TSB activities to provide a seamless set of support and funding options.

• A particular focus on small- and medium-sized enterprises.
  • August 2012: £9.95m for universities and 18 SMEs.
  • November 2012: £39m for 32 universities and SMEs
  • March 2013: £47.2m awarded to 43 SMEs and 7 universities.

• The 2013 Spending Review confirmed TSB funding in 2015/16.
Imanova Ltd

- Joint venture between the MRC, Imperial College London, King’s College London and UCL to utilise GSK’s Clinical Imaging Centre.
- MRC has committed £20m over five years.
- Collaboration across institutions, disciplines and disease areas: cancer, neurological and psychiatric disorders with expansion into cardiovascular, inflammation and others.
- Will carry out clinical trials and develop PET, MRI and multimodal imaging.
Division of Signal Transduction Therapy, Dundee

Sir Philip Cohen
Director Emeritus, MRC Protein Phosphorylation Unit

- **1998**: £6.5m, 5 years (Astra, Zeneca, Pfizer, SmithKline Beecham, NovoNordisk and later Boehringer Ingelheim)
- **2003**: £15.2m, 5 years (AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Merck and Co, Merck KGaA, Pfizer)
- **2008**: £10.8m, 4 years (AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Merck-Serono, Merck KGaA and Pfizer)
- **2012**: £14.4m, 4 years (AstraZeneca, Boehringer Ingelheim, GlaxoSmithKline, Janssen Pharmaceutica NV, Merck-Serono and Pfizer)

- Brings total investment to **£50m**.

- Protein phosphorylation now one of the largest areas of research worldwide with the market for drugs that act on kinases estimated at **$15.2bn in 2009**.
MRC partnerships with research funders
Efficacy and Mechanism Evaluation Programme (EME) – Hosted by NIHR

- EME launched in April 2008 as part of the organisations’ coordinated strategy for clinical trials.

- Funded by the MRC and NIHR, with contributions from the CSO in Scotland and NISCHR in Wales and the HSC R&D Division, Public Health Agency in Northern Ireland.

- Its remit includes evaluations of new treatments, including therapeutics (small molecule and biologic), psychological interventions, public health, diagnostics and medical devices.

- NIHR have funded an additional commissioned stream.
Research facilities for experimental medicine

- NIHR Biomedical Research Centres
- NIHR Biomedical Research Units
- Health Sciences Scotland partners
- NISCHR All-Wales Academic Health Science Collaboration (NISCHR AHSC) partners
MRC/NIHR Phenome Centre

- Funded by the MRC and NIHR (joint £10m grant) and led by Imperial College London and King's College London.

- Is based at the Hammersmith campus of Imperial College and was opened in June 2013.

- The centre will deliver a world-class capability in metabolic phenotyping to the UK research base.

- A legacy of GlaxoSmithKline’s philanthropic support for the 2012 Olympics: builds on the state-of-the-art drug testing equipment used for the games.
E-health research centres

- The MRC has led on a £19m, 10-funder project to support e-health informatics research centres across the UK, supporting cutting-edge research using e-health data and building capacity in e-health records research.

- Four centres awarded in August 2012, along with a centres network to coordinate work.

- July 2013: The MRC announced the £20m Farr Institute. It will have major centres in London, Dundee, Manchester and Swansea and will link research in 19 universities across the UK.
Collaborations with the Wellcome Trust

• August 2012: launched the Wellcome Trust-MRC Stem Cell Institute in Cambridge, each contributing £4m. The institute unites 30 leading research teams with expertise across embryonic, adult and induced pluripotent cells.

• November 2012: announced the Human iPSC Initiative, a £12.75m joint scheme led by the Wellcome Trust (the MRC contributed £4m) to create a catalogue of high-quality adult stem cells.

• May 2013: announced the Wellcome Trust-MRC Institute for Metabolic Science with £14.4m from the MRC and £10m from the Wellcome Trust. The initiative will link fundamental science with experimental medicine and population research.

• UK Biobank.
UK Biobank

- £90m project to collect and disseminate health information (measurements, questionnaire data and biological samples) on 500,000 UK adults between 40 and 69.

- Funded predominantly by the MRC, the Wellcome Trust and the Department of Health.

- Opened as a resource to scientists in March 2012.

- Data can be linked up with health records as study participants age → unique research resource.
National Prevention Research Initiative

- 16-partner funding consortium led by the MRC.
- Research targeting risk behaviours, aimed at preventing chronic disease and promoting wellbeing.
- £33m on 74 projects since 2005
  - Determinants of behaviours – early origins of obesity in childhood
  - Individual level interventions – impact of weight loss programmes
  - Population level interventions – evaluation of alcohol pricing policies across the UK
  - Natural experiments – evaluating activity levels in Olympic Village social housing residents
MRC partnerships with universities
MRC centre partnerships with universities

Centres must:

• Do research in a focused area of strategic scientific need.

• Have a critical mass.

• Attract significant multi-funder investment.

• We have 29 centres and charity partnerships (as at 31/03/2013).
MRC Asthma UK Centre in Allergic Mechanisms of Asthma

• Formed in October 2005 as a partnership between MRC, Asthma UK, Imperial College and King’s College.

• Aims to advance understanding of allergic mechanisms at system, cellular and molecular levels, to inform the development of new treatments.

• 2012: five-year programme of research into the interplay between allergy and viral infection in acute asthma attacks. **£4m** investment by the MRC and GlaxoSmithKline.
MRC-Arthritis Research UK ageing centres

- Two new centres bringing together universities in different cities launched in July 2012.

- MRC-Arthritis Research UK Centre for Musculoskeletal Ageing Research: collaboration between the Universities of Birmingham and Nottingham.

- MRC-Arthritis Research UK Centre for Integrated Research into Musculoskeletal Ageing: collaboration between the Universities of Liverpool, Newcastle and Sheffield.

- £3.75m investment from the MRC and £1.25m from Arthritis Research UK over five years.
MRC Centre for Drug Safety Science

- **£3.7m** venture between the Universities of Liverpool and Manchester.

- Collaborators include AstraZeneca, Novartis, Pfizer, Merck and the Association of the British Pharmaceutical Industry.

- **£29m**, five-year initiative to research drug-induced liver damage, funded by IMI and the EFPIA, announced in May 2012.
MRC university units

- Either established from scratch, or through transfer of an existing intramural MRC unit to a university.
- Retain all the characteristics of intramural MRC units, but the universities take over as the main employers.
- Benefit from closer integration with university research activities & access to new research collaborations and sources of funding.
- We now have 12 university units:

  MRC Anatomical Neuropharmacology Unit
  MRC Epidemiology Unit
  MRC Functional Genomics Unit
  MRC Human Genetics Unit
  MRC Human Immunology Unit
  **MRC Integrative Epidemiology Unit**
  MRC Lifecourse Epidemiology Unit
  MRC Metabolic Diseases Unit*
  MRC Molecular Haematology Unit
  MRC Protein Phosphorylation and Ubiquitination Unit
  MRC-University of Glasgow Centre for Virus Research
  MRC Social and Public Health Sciences Unit
Conclusions

The MRC’s mission requires partnerships with industry, universities, research funders and the NHS.