

### **DEBATE SUMMARY**

Celebrating the centenary of the establishment of the Medical Research Council What should be the research priorities for medical research over the next twenty-five years?

Held at The Royal Society on 22<sup>nd</sup> May, 2013

The Foundation is grateful for the support for this meeting from GlaxoSmithKline and The Kohn Foundation.

#### Chair:

## The Rt Hon the Lord Jenkin of Roding HonFRSE

President, The Foundation for Science and Technology

## Speakers:

#### Dr Sydney Brenner CH FRS HonFMedSci

Senior Distinguished Fellow, Crick-Jacobs Center, Salk Institute for Biological Studies

#### Sir Paul Nurse PRS HonFMedSci

President, The Royal Society and Director, Francis Crick Institute

#### Sir Keith Peters FRS FMedSci FRCP FRCPE FRCPath FLSW

Emeritus Regius Professor of Physic, University of Cambridge

#### Dame Kay Davies DBE FRS FMedSci (Panellist)

Director, MRC Functional Genomics Unit and Associate Head of Division of Medical Sciences and Dr Lee's Professor of Anatomy, Department of Physiology, Anatomy and Genetics, University of Oxford

#### Sir John Savill FRS FMedSci FRSE FRCP (After Dinner)

Chief Executive, Medical Research Council

# The Rt Hon David Willetts MP (After Dinner)

Minister of State for Universities and Science Department for Business, Innovation and Skills

DR SYDNEY BRENNER recalled that his involvement with the Medical Research Council (MRC) went back He had travelled from Oxford to 60 years. Cambridge to see the model of DNA. That had "opened the door to everything". What became the Laboratory for Molecular Biology established itself as a spearhead of research across the world: an open laboratory, non-hierarchical in its approach, contemptuous of administration. The MRC deserved huge credit for creating this vehicle. If there was ambiguity over who was in the driving seat, that did not matter. The key was that the partnership went well. He had spent two fruitful periods on the Council of the MRC.

For him, work on human biology was the top priority for the future. We were a unique species: capable of scientific inquiry and thinking about the future. We now had all the tools we need to bring the highest levels of investigation and discovery to ourselves. Human biology was where all the exciting discoveries would be made in the future: in all scientific fields, not just medicine. It was, however, essential to ensure flexibility in our approach to new research. There was a damaging trend for science to resemble a corporation not a laboratory: the combination of `money, machines and management' was in danger of stifling innovation. The MRC's commitment to micro-biology in the 50s and 60s was daring at the time. It had been prepared to gamble. There had to be space and financial backing in the future for high quality young students to carry out independent research, with no prior commitment to return on investment or prescribed outcomes and unfettered by the dead hand of peer review which meant regression to the mean and sometimes mediocrity.

SIR PAUL NURSE agreed that the MRC was a jewel in the crown of the nation: a key part of the national scientific and intellectual infrastructure. Its role in the eradication and control of disease would be as vital in the future as it had been for the last 100 years, contributing to not only improvements in human health but to wealth creation. The cell was the basic unit of life. We now had unparalled opportunities not just to provide a complete description of cellular phenomena, but an understanding of how the cell works. A systems approach was needed to develop this understanding, with the emphasis on information management. This would mean reducing complexity: focussing on inputs and outputs that can be measured, and the use of models from other organisms to facilitate discovery in the operation of human cells. He endorsed Dr Brenner's call for a focus on the study of

humans. Human genome sequencing was complex, but would be gradually unravelled. These developments, combined with further studies on the effects of environment and the potential of the huge datasets that could be drawn from the National Health Service (NHS) with public support, pointed to new and exciting opportunities for the diagnosis and treatment of disease.

SIR PAUL also pointed to other priority areas for future research: the scope for new approaches to human physiology and micro surgery through the use of imaging and robotics; the use of prototype human organs for physiological studies, as well as treatment; the understanding of the brain, through making use of simpler, model systems for investigation and through combining neuroscientific study with the study of the mind; and the development of new classes of antibiotics to counter antibiotic resistance in the treatment of infectious disease.

SIR KEITH PETERS recalled some of the great figures of the MRC's past: champions of outstanding research. He, too, focussed on recent developments in mapping the human genome, with the potential for disease stratification and for preventive and therapeutic interventions arising from an increasingly sophisticated understanding of the genetic signature. These were complex challenges; but they could be confronted through a combination of more interdisciplinary and interinstitutional working, more linked appointments, stronger synergies with social and behavioural sciences, and more flexible structures with universities. He echoed the call for human biology to be a priority for the future, to which he would add experimental medicine, population science, the development of accessible electronic health records and the forging of stronger collaboration between academia, the health system and industry.

Speaking after dinner, SIR JOHN SAVILL thanked the previous speakers for their contributions and, on behalf of the MRC, the Foundation for marking the centenary of the MRC in this way. He welcomed the emphasis of the previous speakers on the need to study human biology. What they had demonstrated individually and collectively, working with the MRC, was the enduring importance of intellectual curiosity and flexibility, alongside a long term commitment to medical He paid tribute to the present science. Government's affirmation of its commitment to support the direction set by its predecessors, not least in respect of ring fencing the budget.

DAVID WILLETTS recalled that Henry VIII had established the system of regius professorships at Oxford and Cambridge; Charles II had given the Royal Society its charter; and Lloyd George had passed the legislation which led to the creation of the MRC. The achievements of these three statesman were reflected in the continued contributions of the universities, the learned societies and the research councils to the rich, diverse and open culture of intellectual inquiry and discovery from which this country still benefited. This was something to be celebrated and gave us precious advantages in science and research, which we could still exploit internationally, particularly if we could maximise the use of large scale, accessible datasets. This would require international collaboration which the Government was actively pursuing.

Arising from these contributions and the discussions before and after dinner, (for which DAME KAY DAVIES joined the panel of speakers) it was clear that there was a strong consensus around the focus on human biology as a priority for the future. It was not an exclusive priority. Transference of disease from other animals to humans would remain a crucial area of study. Nor did a focus on human biology mean that experimentation on animals would cease, or necessarily reduce significantly: the study of simpler models would continue to be vital. The increasing importance of preventing and treating chronic and degenerative diseases was recognised. This would require a mixed social and scientific response. Arguably gene therapy was about to come of age; and there might be scope for prophylactic therapies in the treatment of conditions such as Alzheimer's disease.

A number of contributors commented on the need for an increasing emphasis on multi-disciplinary, crossorganisational working. There needed to be more movement between academia and industry and more co-funding of posts. All this would create a stronger platform for innovation and disruptive thinking. There was also greater scope for public/private partnerships, broadening for example the scope of trials beyond the narrow interests of a particular company, holding research inquiry open for longer before closing down options, and stimulating more flexibility in regulatory frameworks. The combination made by voluntary and philanthropic organisations to They, too, could play an research was noted. increasing role in research partnerships, as exemplified by the Crick Institute. As datasets and the management of information became an increasingly significant dimension of research, statisticians would need to be more systematically and deeply involved.

Α positive example of overcoming structural boundaries and of the effectiveness of closer collaboration was the Office for Strategic Coordination of Health Research (OSCHR), which now coordinated the work of MRC and the National Institute for Health Research. The process for establishing bio-medical research centres in the NHS had also secured improvements in partnership working at ground level between universities and But there was still undoubtedly NHS Trusts. progress to make in breaking down institutional and structural barriers.

Another strong theme to emerge was the importance of maintaining public confidence in the use of patient data. The potential advantages of the NHS as a research resource were obvious. There was general agreement that when the public were effectively engaged they were overwhelmingly positive about the use of their data to support the public good. The bio-bank was an outstanding example of what could be achieved. Nevertheless it was essential to re-assure the public that their data would handled safely and kept in safe havens. This would require effective systems and positive communications.

The threat of increased competition in the field of research from China and India was discussed.

They were putting more money in; and the quality of research in those countries was improving. But it was important not to be too phased by scale. When it came to new opportunities the playing field was equalised.

Concluding the discussion, the Chairman welcomed the forward-looking flavour of the debate, its positive nature and the consensus around key themes.

Sir Hugh Taylor KCB

#### Useful URLs:

Academy of Medical Royal Colleges www.aomrc.org.uk

The Academy of Medical Sciences www.acmedsci.ac.uk

AstraZenica www.astrazenica.co.uk

Department for Business, Innovation and Skills www.bis.gov.uk

The Foundation for Science and Technology www.foundation.org.uk

Eisai www.eisai.co.uk

Francis Crick Institute www.crick.ac.uk

GlaxoSmithKline www.gsk.co.uk

Medical Research Council www.mrc.ac.uk

Medical Research Council Centenary Timeline www.centenary.mrc.ac.uk

Novartis www.novartis.co.uk

Department of Physiology, Anatomy and Genetics, University of Oxford www.dpag.ox.ac.uk

Pfizer www.pfizer.co.uk

Research Councils UK www.rcuk.ac.uk

The Royal Society www.royalsociety.org

Roche www.roche.co.uk

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