Questions and Answers session (summary)

Respondents were:

- Professor Sir John Savill (JS) MRC Chief Executive
- Professor Bernie Hannigan (BH) Director of R&D and chief scientific advisor, health and social care research and development
- Professor Michael Arthur (MA) MRC Council member
- Professor Michael Schneider (MS) MRC Council member
- Professor Paul Morgan (PM) MRC Council member
- Dr Declan Mulkeen (DM) MRC Director of Research Programmes

Q1: For partnerships with the MRC, is there a rule that the industry has to be UK-based or can they be anywhere in the world?

DM: For the biomedical catalyst which receives funding from the Technology Strategy Board, a legal presence and R&D activity in the UK is required. That said, however, when there are broader collaborations, there is a lot of merit in attracting companies which are not currently active in UK R&D and trying to build those links for the future. In addition to an economic growth agenda, the MRC is also keen to ensure that the research is used somewhere. However, if there is TSB money involved, there has to be a footprint in the UK.

Q2: What opportunities are available to industry, to expand their R&D and to get public funding in order to do that? Is the MRC addressing the matter of lower funding rates to industry as opposed to SMEs and academic organisations?

DM: As a research council, the expectation is that the MRC funds primarily through universities, whilst the Technology Strategy Board funds primarily through industry. As the MRC is working more and more closely with the Technology Strategy Board, particularly in the biomedical catalyst whereby the government has agreed to fund an additional £90m to allow closer working, it makes sense to fund more, and larger projects in SMEs. In that programme, grants of up to £2m are available for up to late stage clinical development in terms of first-into-man studies. However, where the MRC funds independently, there are still some important opportunities worth highlighting. One is at the studentship level where the MRC has worked hard to try to increase the number of CASE studentships that go into SMEs. The other is that there is a lot of scope for companies to strengthen their R&D programmes by working with academic groups who win the research money that provides the knowledge base that is worked on. As we examine the likely impact of the research that we fund, having an industry partner which may not necessarily be contributing to the funding but
is there to exploit the scientific outcomes, can be a great advantage when that academic applies for the grant.

**Q3: What is the MRC’s view on biomedical research centres (BRC) and biomedical research units (BRU)? What advice can Council give to Northern Ireland as we seek to remain competitive with such units in Great Britain?**

JS: In other territories of the UK, the advent of these developments is of enormous help to the MRC because it provides, in the hospital environment, the expertise and infrastructure that we need for experimental medicine studies. Around the country, there have been dramatic improvements in delivering experimental medicine studies and in attracting MRC funding and other funding to do that. The issue for Northern Ireland is that for historical reasons, the R&D budget in the NHS is probably about half of what it should be, compared with say England. The NI health department has already identified £2.6m for partnership with the NIHR which is greatly beneficial. However, I would agree that a missing piece is in the area of BRCs and BRUs; in comparably sized English systems, I have seen £1m a year make a huge difference. From discussions yesterday with the ministers for health, for employment and learning and the chief executive of Invest Northern Ireland, I believe there is a sense of cross-departmental interest in trying to find the funds for a development like that in Northern Ireland.

BH: I think the challenging part will be to ensure that all Northern Ireland stakeholders emphasise those points consistently to the politicians and government ministers with whom they interact. The health department has contributed; I think the other departments should also be contributing to this from which all can benefit.

JS: To do the studies required in the biomedical catalyst arena, that is, to add value to new prospects, to do the experimental medicine, proof of concept, and proof of mechanism in humans, requires the specialist facilities of a BRU. That is an example of how with a facility and £1m a year, Northern Ireland could be much more competitive for a pool of funding that has double value because it drives the economic growth supporting the companies.

**Q4: Can Council advise on how we can further promote the excellent progress being made in Northern Ireland and link the outcomes more closely to other regions of the United Kingdom?**

MA: Making cases based on geography when trying to drive excellent science can work, and there are many successful examples in Northern Ireland, but it should not be restricted to that. What is most successful in any partnership is the best working with the best. With regards to the new developments, particularly the biomedical catalyst programme, I would actively encourage you to work out who best to partner with from around the UK. I would advise you to find out who the most relevant people in the UK are, approach them and partner with them. With the need for the country to drive innovation and growth, if you have good ideas and unusual partnerships that you want to pull together, for example, multiple partnerships, SMEs, big industry, several universities, please challenge the MRC with the proposal and bring it forward.

**Q5: One thing missing from the health research partnership is local alignment of policy. Are there any lessons to be learned from what has happened, even in other jurisdictions or other regional development agencies?**
JS: There has been great alignment of policy between the Technology Strategy Board and the MRC, that in England, at least, has replaced the regional development authorities with respect to R&D, and particularly with regards to stratified medicine. Scottish Enterprise in Scotland has also helped the MRC with the Centre for Regenerative Medicine. The North-West Regional Development Agency in the North-West of England also played a really seminal role, not just in investing in Biobank but also driving genetics knowledge parks. The alignment in policy between a development agency and the health research strategy can be very beneficial.

BH: The Memorandum of Understanding (MOU) for Connected Health serves as the policy and action plan between Invest Northern Ireland and the health department. In the development of the MOU, I was concerned that it should be about health research and prosperity, but focused only on the growth of the indigenous connected health-related companies. To guarantee that it went forward, I ensured that the MOU and action plan was only for Connected Health and prosperity, but it stated in the wording that this was an initial phase and there would be subsequent phases to look at other aspects of health-related R&D and prosperity. Invest Northern Ireland has accepted that Connected Health is only the start; they need to do more with other life sciences companies, including indigenous companies.

Q6: One of the key challenges faced by the implementation of stratified medicine is an IT one. The MRC’s own documentation alludes to the fact that for 90% of prescribed medications, 30% to 50% don’t work. Part of that is nothing to do with genotype or predisposition to disease; it is an information management problem. There is a huge volume of inaccessible data in the NHS. There is also the problem of poly-pharmacy and inappropriate prescribing that can be actioned now without the implementation of genetic data or biomarker data.

JS: Northern Ireland can address this issue because you have a unique identifier that is used to a high degree in your local health service. You can track over time in the population for example the effect of prescription of statins or anything else that you are interested in. The existing systems give you great opportunities to pursue stratified medicine; you can stratify against haemoglobin level or sodium concentration. However, the NHS does not have the level of investigative penetration required to stratify against, for example, genotype. One of the things that the MRC is going to lead on, on behalf of the Office for Strategic Co-ordination of Health Research (OSCHR), is an examination of what we need in terms of molecular pathology for stratified medicine. We want to see this research translated for patient benefit and it won’t be unless patients have access in the service to tests that enable stratification to be done. But I would encourage you - you have a strong system here and a commitment politically and financially to Connected Health and it gives you some currently unique opportunities.

Q7: Could you provide a sense of the impact that the BRUs and BRCs have had, not just on the universities but also on the healthcare trusts? My observation from the outside is that they have not only had a transformative impact on some of the universities but a similar impact on the trusts. They are bringing together clinicians who had been lost to research, so that there is a real engagement from some of the organ disciplines back into early phase clinical trials and subsequent phase three studies.
JS: That does happen in the successful areas and BRCs; that is one of the benefits of such an initiative. If it is an area for which your devolved government can identify funds, that would certainly assist.

MS: I would like to respond to that as the academic lead for the cardiovascular BRU at Imperial. The BRUs have a relatively modest spend compared to the BRCs, but I think in part because they are mission centric and tailored and focused, the relatively finite resources go a long way and have a big impact. That is manifested by the fact that the Royal Brompton and Harefield NHS Trust has made a considerable contribution with capital funds, running costs and recruitment funds. It sees the BRU as central to its mission, not just by providing its patients access to innovative but experimental care, but also adding to its prestige and adding to its lustre as a destination for training and highly able and transformative consultants. I echo very much your comments about the BRU as a springboard for training; our cardiovascular BRU has invested in four or five clinical PhDs who started only a day or two ago.

MA: We have a musculoskeletal BRU in Leeds and one of the impacts that that has had has been to bring together the rest of the university to that entity, particularly biomedical engineering. That has been hugely successful and I think that may not have happened quite as well had the BRU not been there.

PM: From a Welsh perspective, we were similarly disadvantaged not that very long ago. Through the NISCHR and the Academic Health Sciences collaboration, which is an all-Wales collaboration, there was a competition and, awarded on excellence, one neurosciences BRC and three BRUs. Even though they are not funded with huge amounts of money (I think the BRC gets £1m over three years), they have been transformational in terms of bringing the health service into alignment with research excellence across Wales.

**Q8: Please could you comment on the interface between the MRC and other research councils in terms of social determinants of health on the one end, or perhaps environmental exposure sciences on the other in environmental health?**

JS: The MRC is an active participant in cross-council challenge programmes. For example, ‘Lifelong Health and Wellbeing’; in that area we have worked particularly closely with the Economic and Social Research Council (ESRC). Obviously, the use of social data linkages would be enormously helpful in medicine, so that partnership works well. Another cross-council programme, ‘Living with Environmental Change’, has brought the MRC closer to the Natural Environment Research Council (NERC) as well. The cross-council grand challenges have therefore been good in stimulating cross-council working. In an area that I am closer to, regenerative medicine, the MRC found very strong support from the Biotechnology and Biological Sciences Research Council (BBSRC) and Engineering and Physical Sciences Research Council (EPSRC) in setting up an intermediary regenerative medicine platform to link to the TSB catapult. I think the research councils are very good at working together and, certainly in the two areas that you describe, there are plenty of examples of success.

**Q9: Please could you comment on the interaction of the MRC with charities other than Alzheimer’s, the Wellcome Trust and Cancer Research UK?**

JS: Approximately 18 months ago, the Association of Medical Research Charities wrote a report called Ways and Means, which included a diagram of how
government funding and charitable funding interacts. In that, they put the MRC right at the centre. Obviously, we do have many high profile collaborations with the Wellcome Trust and Cancer Research UK, but we also have collaborations with a range of other charities, in particular, in the training area. We co-fund often the largest proportion in clinical training fellowships, PhD studentships; there is a range of much smaller charities that have added value by working with the MRC. Obviously, we focus on AMRC charities because they adhere to a particular code of fundraising engagement and peer review. However, it is a particularly important area for the MRC and it does link us very well to patients and families afflicted with important diseases. That is a resource needed for when we have to argue the case for funding.

Q10: One of the things absolutely necessary to make small molecule drugs is excellence in chemistry: synthetic and medicinal chemistry. There is a general feeling in the UK organic chemistry community that it is becoming harder to get funding for early stage medicinal chemistry. Is that something the MRC has any thoughts and plans around?

JS: Our partner organisation, EPSRC, has decided to prioritise areas: in future some areas may receive less funding, others may receive more. In our area, the home of medicinal chemistry is usually pharma companies. The way to access medicinal chemistry is through collaboration with pharma and with specialist small companies. There are academic operations; the Wellcome Trust has driven this in particular. One of our MRC units, the Cancer Cell Unit (Cambridge), has a major seeding drug discovery award from the Wellcome Trust in this area. MRCT, a sister organisation separate from the MRC, also has capabilities in its Centre for Therapeutic Development. Clearly we are keen to see chemists apply to the MRC with ideas that are relevant to our mission. However, I do not believe it is the place of the MRC to undertake combinatorial chemistry that might be done better somewhere else. But it is the place for the MRC to fund particularly innovative uses of modern chemistry for example, click chemistry in imaging. Chemists do hold an important part to play in the MRC’s mission but I believe that it is primarily the responsibility of others to fund chemistry research.

Q11: The UK pharma industry is a fraction of what it was 15 years ago. Is that going to be sustainable going forward? Do the research councils need to get together and have strategic focus on how it is going to work?

JS: Some of it has been lost in the UK; however, much is still present. Pfizer has retained that area of chemistry and also their pharmacy formulation expertise. Eli Lilly still have strong chemistry and targeted chemistry expertise. However, what the medical community could strengthen is linking to that.

Q12: Making these achievements relies in part on junior faculty members and junior professors. What advice can Council give to them?

JS: We have heard a lot about overarching initiatives and strategy. However, much of the MRC’s core business remains problem, curiosity driven research. The MRC’s four research boards are particularly keen to support young investigators. The MRC commits around £60m a year to training and career development; it has a comprehensive range of opportunities for young people who have yet to achieve a permanent faculty position, all the way up to senior fellowships which have international professorial status. But what happens to the new lecturer in a university? The boards have put particular emphasis on supporting young investigators through the new investigators scheme, and indeed are prepared to iterate with young applicants. Last year, we awarded the maximum number we had ever awarded and we had the highest success rate. It is still very competitive
and applications must be of very high quality, but we are keen to support young investigators; the evidence is high success rates and a rising number of people being awarded. Clearly what young investigators need is excellent local mentoring. We are therefore having discussions with the Academy of Medical Sciences, where the mentoring of young clinician scientists has been very successful, about how we can partner them. We have seen some funders temporarily withdraw, for example Cancer Research UK, and we have seen some funders like the Wellcome Trust change their strategy and look for the most competitive folk in the community. However, we are definitely open for business in that area.

Q13: It is clear that there is a lot of funding going into translational research. Tom Walley (NIHR) has said that to move into EME and HTA, there would be a concept of pull-through; projects that were MRC-funded would be taken forward and approached. Is that a reality you still see happening?

JS: Firstly, although the MRC received additional funds in the 2007 Spending Review for translation, we still retained all of our discovery science funding. We still spend over £400m a year on discovery science.

The MRC team meet frequently with Raj Thakker and Tom Walley who chair and co-chair the EME Board, and that is the direction of travel. Staff in the MRC involved in helping EME achieve its aims are very well appraised of what is passing through the developmental pathway.

Q14: Do you have any figures for projects funded from the developmental pathway in the MRC’s Developmental Clinical Studies scheme?

JS: Not yet; it is probably too early to ask that question. We do need to make a sustained commitment.