

The Academy of Medical Sciences promotes advances in medical science, and campaigns to ensure that these are translated into healthcare benefits for society. Our elected Fellowship includes experts drawn from a broad range of research areas. We welcome the opportunity to respond to this consultation on a **National Innovation Plan** – one of the Academy's objectives is to facilitate strong and equitable partnerships between academia, industry and the NHS, in order to support a thriving innovation ecosystem.

Developing an effective framework for innovation requires consideration of a broad range of issues; we would draw your attention to the submission by the Royal Academy of Engineering which addresses many of these in greater detail. However, we wish to highlight several specific challenges pertinent to medical research. One area in particular is the emerging field of precision (or stratified) medicine, which has the potential to revolutionise healthcare by targeting specific patient subgroups to increase treatment efficacy and reduce waste.¹ The UK should strive to provide a world-class environment for innovation in precision medicine, reaping the health and economic benefits this will bring.

Placing the NHS at the heart of medical innovation

The NHS has a central role to play and the Academy's FORUM, which links industry, academia, healthcare, and charity and regulatory sectors, has highlighted this in a recent report, both in the context of precision medicines and more broadly.² We welcome the progress made in streamlining regulation and governance for healthcare research within the NHS since the founding of the Health Research Authority, and look forward to the outcomes of the Accelerated Access review which will help shape debate in this area. Improvements in the targeting of medicines means drugs will increasingly be tailored to smaller patient subpopulations; hence clinical trials will require access to larger populations from which to select participants and it will be vital to maintain dialogue through the European Medicines Authority to ensure an appropriate framework for innovation within the EU.³

The unique position of the NHS, as both a driver and consumer of innovation, can help direct innovative research towards patient needs. Enhancing the absorptive capacity of the NHS requires engagement with both patients and healthcare professionals around new treatments and technologies, and sufficient financial 'headroom' to cover the adoption of innovative solutions in order to deliver longer-term savings. Embedding research within the culture of the NHS brings the development and consumption of innovation under the same roof; the Academic Health Science Network model provides a strong framework for this and should be supported.⁴

Data access for innovative research

Access to data is an important driver of innovation, facilitating the development and evaluation of novel therapeutic strategies, diagnostic tools and biomarkers. Establishing the NHS as a

¹ For a more precise definition, see <https://ghr.nlm.nih.gov/primer/precisionmedicine/definition>

² Academy of Medical Sciences (2015). *Stratified, personalised or P4 medicine – FORUM meeting report.*

³ Academy of Medical Sciences (2013). *Realising the potential of stratified medicine.*

⁴ <https://www.england.nhs.uk/ourwork/part-rel/ahsn/>

source of such data provides an invaluable advantage to UK medical innovation, and also ensures that UK patients are the first to benefit. The Genomics England '100,000 Genomes Project' represents a groundbreaking example of publicly-led data acquisition within the NHS, and future projects should capitalise on the data infrastructure driven by this endeavour.⁵ Increasing the availability of patient data requires a broad understanding of the complexities of this topic, and we would welcome BIS officials to the upcoming All Party Parliamentary Group on Medical Research event on 12 July – *How patient data is revolutionising healthcare*.

Support for Innovate UK

Innovate UK (IUK) will continue to play an important role within the newly-announced UK Research and Innovation – we urge careful evaluation of any further shift in the IUK portfolio from grants towards loans, acknowledging the effect this may have on the risk profile IUK can maintain when investing in innovative research. Support for regional clusters of excellence facilitates interactions across the diverse UK innovation landscape, and we welcome IUK funding for the Precision Medicine Catapult, which provides a collaborative space for the development of novel diagnostics and therapies.⁶ More support for clusters is required, however – a previous Academy FORUM event identified concerns about a relative lack of financial support for UK clusters, which was limiting stability, incubator space and access to risk capital, and we will be following up this event in the autumn.⁷ To compete at a global level, UK innovation must be resourced at appropriate levels relative to comparable nations; we note, for example, that in 2013 Finland invested more via its innovation agency than the UK, despite having an economy one-tenth the size.⁸

Conclusion

Advances in basic biomedical science and technology have opened up new fields for medical innovation, bringing economic and healthcare transformations. Capitalising on the precision medicine revolution requires an integrative, cross-Departmental approach to support productive collaboration between academia and industry, and ensure the NHS plays a central role in driving innovation with its wealth of expertise and data. Government support and leadership is essential in nurturing a medical innovation infrastructure that remains at the forefront of developing and embracing world-leading technologies and medicines of the future.

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⁵ <http://www.genomicsengland.co.uk/the-100000-genomes-project/>

⁶ <https://pm.catapult.org.uk/>

⁷ Academy of Medical Sciences (2015). *Geographical clusters – FORUM meeting report*.

⁸ Royal Society, British Academy, Royal Academy of Engineering & Academy of Medical Sciences (2015). *Building a stronger future – research, innovation and growth*.