Written evidence submitted by UK academics engaged with Responsible Research and Innovation (UKR0014)

1. This submission highlights the importance of integrating Responsible Research and Innovation (RRI) into the role of the Interim Chair of UKRI. RRI describes a research and innovation process that takes into account effects and potential impacts on the environment and society. RRI can be defined as *a transparent, interactive process by which societal actors and innovators become mutually responsive to each other, with a view to the (ethical) acceptability, sustainability and societal desirability of the innovation process and its marketable products, in order to allow a proper embedding of scientific and technological advances in society*.

2. RRI aims to foster anticipation, reflection, inclusion and responsiveness in the research and innovation community to shape existing and future research and innovation-related processes in alignment with democratic principles. In doing so RRI seeks to improve the quality of the knowledge/technology/innovation by integrating a range of perspectives into the development process (c.f. Arsenic Biosensor Collaboration from Cambridge/Edinburgh Universities www.arsenicbiosensor.org).

3. The concept is currently applied mainly to science and technology-based research and innovation, in particular, in the area of emerging technologies—notably nanotechnologies, information and communications technology (ICT), genomics, synthetic biology and geo-engineering. However, RRI could also encompass financial instruments, public policy or community innovations, distribution, and service or system innovations. RRI is currently part of the strategy of some aspects of research policy and funding in the UK (e.g. in the EPSRC) but should be covered more comprehensively.

4. **Question 1.** The role and **objectives of the interim** Chair of UKRI, including any research or other input from UKRI on the content of the Bill.

5. In light of the current socio-political climate, and specifically the post-referendum distrust of 'experts' as elites who are not in touch with the concerns of 'ordinary' citizens, the reorganization of the UK research and innovation funding system around a body that combines business focused innovation, (previously funded through Innovate UK), with academic education and research, (previously funded through HEFCE and RCUK), into an integrated UKRI funding body, will require a transparent, iterative process of engagement with citizens to safeguard the reputation of academic researchers as independent, trustworthy, actors producing economic and others forms of value for the public good.

6. In order to justify the investments in research and innovation, it will not be enough to focus on economic impact through collaboration between the research base and the commercialisation of discoveries in the business community. This is especially true if this business community is perceived to be composed of multi-national corporations that will outsource the jobs and benefits of the research commercialisation.

7. Following the breakdown of trust in the scientific experts that occurred during the debates about genetically modified crops in the 1990s, Responsible Research and Innovation was introduced into the EU's Horizon 2020 research funding as a cross-cutting issue in recognition of the need for better public engagement by the research and innovation community in order to more carefully consider the directions of Research and Innovation in the context of broader exploration of its benefits and risks to society.

8. As part of the process of justifying investments through UKRI, the interim chair of UKRI will have to establish a framework for assessing the value to society and impact of research and innovation funding. An important aspect of this will be the need to look beyond the immediate scope of

research projects to identify secondary impacts on citizens, communities and society (including the environment). Examples of such impact assessment exercises include:

- Lignocellulosic Conversion to Ethanol (LACE) project, a bioenergy project funded by BBSRC, with Social Science & Ethics theme that produced a framework for assessment of biofuel impacts framed in terms of responsible innovation (http://dx.doi.org/10.1016/j.biombioe.2015.04.022)

- the King's College London reports from the Foresight and Responsible Research and Innovation Lab (FRRIL) reports (http://www.kcl.ac.uk/sspp/departments/sshm/research/Research-Labs/FRRIL.aspx) on the Human Brain Project (e.g. neurorobotics) and Synthetic Biology (CSynBi) e.g. dual use, biosecurity and containment issues;

- the EPSRC-funded 'Flowers Consortium' that builds on the CSynBi project (http://gow.epsrc.ac.uk/NGBOViewGrant.aspx?GrantRef=EP/J02175X/1);

- the BBSRC-EPSRC funded Mammalian Centre for Syntehtic Biology at Edinburgh;

9. **Question 2.** the timetable for establishing UKRI, **and early priorities for action**.

10. The Case for the Creation of UK Research and Innovation clearly identified the need for multi- and interdisciplinary research that lies outside the remit of the current funding bodies but is a common property of many current and future challenges, such as the "Grand Challenges" of: tightening supplies of energy, water and food; pandemics; ageing societies; global warming; public health and security, and the UN Sustainable Development Goals.

11. One such cross-cutting research method is Responsible Research and Innovation which, due to its multidisciplinary nature of anticipatory engagement with the societal challenges of research and technological developments, has so far only received limited UK funding through the Engineering and Physical Sciences Research Council (EPSRC). Most RRI activities in the UK are currently funded through Horizon 2020.

12. The European Commission stated in 2013 that because Responsible Research and Innovation was "a cross-cutting action that is implemented throughout Horizon 2020, 0.5% of the budgets for the 'Societal Challenges' and 'Industrial Leadership' pillars of Horizon 2020 [was] earmarked for RRI/Science with and for Society actions." Innovation and new technologies should meet global challenges such as climate change and global warming, the efficient use of natural resources, demographic change, global health and development, social cohesion and the maintenance of economic prosperity. Similar initiatives exist elsewhere, for example in the Dutch MVI programme or the Norwegian Research Council.

13. The establishment of the UKRI is an opportunity for the UK to position itself, via investment in RRI, as a leader in anticipating not only the science and technology implications of proposed research developments, but also their societal impacts. This will allow the UKRI to steer science and technology development towards greater social benefit and impact.

14. In consideration of the responsibilities previously positioned under HEFCE, and the stated goal of UKRI to promote multidisciplinary research, one of the priorities of UKRI should be to set out a clear strategy for providing longer term structural support for multi-disciplinary work; especially to find a solution for the disconnect between the strong demand for multi-disciplinarity from industry/innovation and the growing number of multi- and interdisciplinary research projects on the one hand, and on the other, only minimal opportunities for career progression within academia for early-career researchers engaged in multidisciplinary research. RRI offers a unique opportunity to

integrate such multidisciplinary work into existing research streams and simultaneously promote the public good.

15. **Question 3.** The governance of UKRI

16. As stated in the Case for the Creation of UK Research and Innovation, the governance of UKRI has a "n*eed for a system that is sufficiently integrated, strategic and agile to meet future challenges"*

17. An important aspect in meeting future challenges will be the ability to surface potential collateral consequences of new developments in science and technology, especially in their impact on society and the environment. The Responsible Research and innovation framework provides a set of tools and expertise for addressing this need.

18. At the same time, RRI can contribute to the balance between independence and accountability to Parliament and the public through the integration of continuous iterative and transparent engagement with the public throughout the life-cycle of research and innovation projects, thereby reinforcing the trustworthiness of the research community.

19. In order to obtain the trust of citizens for publicly funded research policy, the combined research and innovation support landscape that is to be created by UKRI must be used as an opportunity for the UK to become a world leader in systematically including citizens' views in Research and Innovation policy.

20. Strategic approaches to future challenges and a maximisation of the value and benefit from government's investment in research and innovation will be strengthened if deliberative RRI processes are used that give a voice to citizens in shaping and identifying opportunities for research and innovation.

21. **R**esponsibly combining **R**esearch and **I**nnovation via RRI can support the transition from research to innovation by increasing the forward planning, anticipating future use cases during the research stage and establishing the parameters of societally acceptable uses of new technologies (e.g. GMO, energy sources like wind farms or fracking, AI and Robotics).

22. Signatures of RRI researchers and academics

Dr. Ansgar Koene, Senior Research Fellow, Horizon Digital Economy Research Institute, University of Nottingham

Prof. Bernd Stahl, Professor of Critical Research in Technology and Director of the Centre for Computing and Social Responsibility, School of Computer Science and Informatics, De Montfort University

Prof. Marina Jirotka, Professor of Human Centred Computing, Department of Computer Science, University of Oxford

Prof. Derek McAuley, Professor of Digital Economy in the School of Computer Science at the University of Nottingham and Director of Horizon Digital Economy Research Institute

Dr Peter Gray, European Projects Adviser and Principal Trainer, Research Advantage Programme, Leeds

Dr. Robert Farrow, Research Fellow, Institute for Educational Technology, The Open University (UK)

Dr. Kate Chatfield, Senior Lecturer, College of Health and Wellbeing, University of Central Lancashire

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Dr. Indrani Mahapatra, School of Geography, Earth and Environmental Sciences, University of Birmingham

Dr. Kostas Iatridis, Lecturer in Business and Society, School of Management, University of Bath

Prof. Norberto Patrignani, Univrsita' Cattolica of Milano, Italy

Dr. Philip Inglesant, Research Associate, University of Oxford

Molly Bond, PhD candidate in Global Political (Bio)Economy, University of Bristol

George Ogoh, PhD candidate in Ethical Issues of Additive Manufacturing, De Montfort University, Leicester

Dr Les Levidow, Senior Research Fellow, Open University

Dr. Michael Reinsborough, Research Associate, Global Health and Social Medicine, King's College London

Dr. Mark Hartswood, Research Associate, University of Oxford

Tilimbe Jiya, PhD Candidate, De Montfort University, Leicester

Hilary Sutcliffe, Director, Society Inside®

Dr. Elvira Perez Vallejos, Senior Research Fellow, Horizon Digital Economy Research Institute, University of Nottingham

Dr. Kutoma Wakunuma, Senior Research Fellow, Centre for Computing and Social Responsibility, De Montfort University

Dr. Christine Aicardi, Senior Research Fellow, Department of Global Health & Social Medicine, King's College London

Dr Charly Ryan, University of Winchester Faculty of Education, Health and Social Care

Prof. Nikolas Rose, Head of Department of GLobal Health & Social Medicine, King's College London.

Prof. William Housley, Cardiff School of Social Sciences, Cardiff University

Christian Hansen, PhD Candidate, De Montfort University, Leicester

Dr Sujatha Raman, Director, Leverhulme Making Science Public Research Programme, University of Nottingham

Dr Claudia Pagliari, Director, Global e-Health Programme, The University of Edinburgh

Dr Peggy Gregory, Senior Lecturer, School of Physical Sciences and Computing, University of Central Lancashire

Dr. Robert Smith, Research Associate (Synthetic Biology and Responsible Innovation), Department of Global Health & Social Medicine, King's College London

Dr. Lalitha S. Sundaram, Research Fellow (Emerging Biotechnologies and Global Health), Department of Global Health & Social Medicine, King's College London

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