

**Written Evidence Submitted by Professor Matthew Rosseinsky
(RFA0083)**

Dear House of Commons Science and Technology Committee,

I am an employee of the University of Liverpool and currently a Royal Society Research Professor in materials chemistry. I am writing in a personal capacity.

I have experience of working in fundamental research in an area where there are many potential consequences for current and future technologies. The overall Government approach of increasing funding to 2.4% of GDP and streamlining the funding of the best research is to be welcomed. I feel it is important to be clear about the remit of the proposed new agency. In the US, DARPA has a clear customer (US military) and thus a well-defined mission. The UK is quite different from the US (and other oft-used comparator countries e.g., Germany, Israel, South Korea) so it is important that any changes to the funding landscape clearly take this into account. Specifically, the US military-industrial complex does not exist in the UK and direct mapping of DARPA benefits onto the UK innovation system and associated economic benefits would be unsafe.

The phrase “blue skies research” needs to be carefully defined when considering the remit of this agency, as it means quite different things to different people. To me, it means research undertaken with the aim of increasing knowledge and understanding rather than directly targeting a specific application benefit. In passing, I should say that I find “pure” and “applied” rather unhelpful separations, preferring to think of “good” (with ramifications for something we did not have before, whether understanding of basic science or progressing a technology to market) and “not so good” (derivative and thus not additive, purportedly applied etc). The text of the original document refers to “Backing a new approach to funding emerging fields of research and technology”, which is not the same as “blue skies”. Before such a proposal can be assessed, its scope needs clarification.

This is important as the Research Councils within UKRI have the mission of advancing basic scientific knowledge, and there is considerable potential for confusion here. I feel that if the aim is to make the UK better as a leader in the generation of basic scientific (here science means science and engineering) knowledge, then there is a much simpler way to do it than setting up an entirely new agency, or other new actors. Due to pressure from Treasury, over the entire duration of my career, the Research Councils have come under relentless pressure (whose effects they have done an excellent job of minimising) to set their work in an economic context that is short-term and over-constrained by Treasury’s perception of the needs of current incumbents. This is an excellent way to minimise the benefits of the substantial investment the UK makes in the Research Councils, as it uses short-term criteria to drive the allocation of resources purportedly intended for long-term benefit. There is another way.

By assessing the contribution UKRI makes to the UK by providing knowledge leadership in key fields of activity over suitable (perhaps decadal) time frames commensurate with the nature of the activity, the Research Councils can be usefully held to account. They can then be encouraged to reduce the number of criteria used to assess the distribution of funding to those that are relevant to the likely outcomes i.e., the immediate past track record of the team and the quality of the idea seen in the context of the track record (with different but similarly motivated criteria and schemes for early career researchers, those who have had to take breaks etc). The effective communication of these benefits to value creators and communication with them will be part of the responsibilities of the research community, but they will not be required to schedule inventions and predict the direct impact of their work over unfeasible timeframes to secure funding – instead they will need to justify its novelty and its ramifications.

The above may seem tangential, but one of the main arguments in favour of ARPA-like agencies is that “peer review is too conservative” which is why the rate of innovation has slowed. I feel this is a category error. Peer review criteria and mechanisms are defined by the funders, who are responsible to Treasury. With a focus shifted to creativity and novelty, peer review will be freed to transform the quality of what emerges from public funding. Increasing the UKRI budget and transforming peer review to focus on track record and associated quality of ideas will be a low-bureaucracy way to rapidly deploy the welcome proposed funding increase to generate transformative outputs. This will make direct use of our powerhouse research Universities, which are an asset that the UK should make more of (I am conflicted in stating this, as I am a University employee). It is always easy to imagine things would be better if they were radically different, we should not overlook what is working well when doing so.

I do not see the proposed agency as necessarily a bad thing, I do though feel there are very large risks present in destabilising the current research and innovation system, particularly at a time when there is already tremendous uncertainty. Regarding the operation of any new agency, I would suggest that long-term support should mean that – a 5-year project with goal/metric-driven annual review is usually 5 one year projects. We need to trust leaders in science more to free them to deliver their vision and the associated benefits. If that is the driver for the new agency, other ways of achieving this should also be considered. I hope I have drawn your attention to the importance of seeing any intervention at the proposed scale in the context of the entire UK research and innovation system.

Yours faithfully

Matthew Rosseinsky

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