Royal Society of Chemistry
Burlington House
Piccadilly
London W1J 0BA, UK

Tel +44 (0) 20 7437 8656
Email macdonaldh@rsc.org

www.rsc.org

Chair, House of Commons Science and Technology Committee
Committee Office
House of Commons
London
SW1A 0AA

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Dear Mr Clark,

I am writing on behalf of the Royal Society of Chemistry in response to the joint inquiry on *Covid-19: lessons learnt*. This letter points to relevant recommendations from our earlier submissions to the House of Commons Science and Technology Committee's inquiries *UK science, research and technology capability and influence in global disease outbreaks* and *The role of technology, research and innovation in the COVID-19 recovery*, as well as to relevant evidence to the House of Lords Science and Technology Committee's inquiry *The science of COVID-19* and includes additional examples where available.

1. Coordination of testing and advice mechanisms

The chemical sciences, working in partnership with other disciplines, are a central part of both diagnostic and serological testing responses to manage the COVID-19 pandemic. Examples of how chemical research has contributed to improvement of point of care lateral flow tests are captured in our evidence submitted to the House of Lords Science and Technology Committee's inquiry *The science of COVID-19*.

Members of our community volunteered equipment, reagents, skilled personnel and laboratory space to support testing in the early stages of the pandemic, often contacting multiple agencies in parallel and with no clear sense as to whether a local or national coordination effort was in place. Many expressed frustration to us about the lack of willingness or ability to accept support, as evidenced in our response to the *UK science, research and technology capability and influence in global disease outbreaks* inquiry.

Since July, we have been informed of additional examples of similar experiences. One member of our community told us how they were in touch with PHE, the NHS, and the Government's Chief Medical Officer alongside completing the relevant online forms to offer their laboratory facilities, trained scientists and large car parking space to support testing capacity in the spring. They had not received a response via any of these routes when contacting us at the end of October.

Other examples we received show that similar challenges in coordination have impacted aspects of the COVID-19 response beyond testing. Examples from our community include attempts to share a protocol for sterilisation and reuse of PPE developed to mitigate shortages and the transfer of safety procedures used in the handling of hazardous chemicals into an antiviral setting. Further, we heard about the knowledge and experience of manufacturing at scale and supply chains which resides in the industrial sector and their networks, a capacity which can be pivoted to address challenges such as COVID-19. Reflecting on their experiences over the last eight months, we heard from members in industry of a need to develop comprehensive knowledge of UK capability across multiple sectors in order to enable its rapid mobilisation, to capitalise on existing networks and join up resource in the face of future challenges.

These examples further support the 2nd Recommendation in our response to the *UK science, research and technology capability and influence in global disease outbreaks* inquiry:

Recommendation 2 - Part of the lessons learned should include evaluation of civil service capacity to undertake this level of national and local coordinated response, drawing together UK scientific capacity at such speed. This includes assessing scientific advice mechanisms and/or scientific skills needed at official level to undertake rapid coordination.

2. UKRI response funding

The UKRI rapid research call for 'ideas that address COVID-19' invited proposals for short-term projects addressing and mitigating the health, social, economic, cultural and environmental impacts of the COVID-19 outbreak. Examples of chemical research in response to this call include projects aiming to mitigate transmission of the virus via the formulation of anti-viral films (consortium including University of Birmingham and Innospec) or by tuning the properties of surfaces themselves to deactivate the virus (University of Birmingham and University of Cambridge collaboration).

In the RSC response to *UK science, research and technology capability and influence in global disease outbreaks*, we shared experiences of our community reflecting on delays to assessing proposals and made the following recommendation:
Recommendation 6 – UKRI should publish data on the time taken for the assessment of proposals (from application submission to panel decision) submitted to its open call on COVID-19. This, alongside other evidence, should be used to evaluate the scheme and manage expectations in future. Whilst there is much to be commended in UKRI's rapid response to the research challenges that Covid-19 presents, there will be lessons that can be learned on how to design and manage such schemes effectively in a time of huge live challenge.

Since July, we have heard similar reflections from members of our community who were awarded funding from early rounds of this call. This includes a collaboration between a university and a chemicals company who commented that while the decision was reached quickly, the official letter subsequently took several weeks to arrive, delaying the start of the project. Another researcher commented that having met UKRI deadlines it took over two months before they heard a response and a further two to set up the grant. However, we are also aware of the challenge for UKRI in the number of submissions received and the impact that the availability of funding has had in supporting research to address the pandemic.

In addition, several researchers have raised that the initial funding calls focussed too narrowly on short grants to address the immediate impacts of the pandemic. They felt this should be balanced with a medium-term strategy to facilitate research mitigating the longer-term impacts of the pandemic as it progresses. A further gap we have been made aware of, is support for the development and initial commercialisation stages of research. One example describes the challenge a group of collaborating researchers from three UK universities and a newly formed SME faced in finding funding routes that bridge the gap between research and the early development stages required to attract further investment. They have been working to bring a point of care COVID-19 testing device to market, modified from previous research targeting an avian flu virus. Whilst the project received some grant funding from Innovate UK, there was a feeling that support for earlier development stages was lacking in the available funding streams.

Additional recommendation – UKRI should assess whether the duration of grants as well as the balance between addressing issues in the short versus longer-term could be improved in response to future similar challenges.

3. Protecting Small and Medium Enterprises (SMEs)

In our previous submission to *UK science, research and technology capability and influence in global disease outbreaks* we outlined the role of SMEs in the drug and vaccine discovery chain. Many feature a strong R&D capacity and highly skilled staff, which, combined with their size, equip these businesses with great agility. Throughout the pandemic, SMEs have mobilised both to achieve COVID-safe ways of working and to pivot their work to contribute to the pandemic response.

Examples of the work that UK companies are undertaking to contribute to the COVID-19 effort are listed below:

- COlorifix – a spin-out company from Cambridge University developing antiviral pigments to prepare antiviral PPE for use in hospital settings.
- Exscientia – have developed a drug discovery platform based on AI technology that enables faster drug target selection. The company works with large multinationals including GSK and Roche - an example of how SMEs support R&D in other parts of the science ecosystem.
- Sphere Fluidics – some of the company's existing technology is relevant to the process of vaccine discovery and development; specifically it enables faster antibody discovery and cell line development.

The contribution of our SME community demonstrates their adaptability and resilience. Financial support packages including Coronavirus Business Interruption Loan Scheme, the Future Fund and the furlough scheme enabled most SMEs in our community to stabilise in the short-term, following initial challenges at the start of the pandemic[1]. More detail on the experience of chemistry research in business settings can be found in Section 3 of our earlier submission to *The role of technology, research and innovation in COVID-19 recovery.*

We would reiterate that SMEs are a vital part of the research ecosystem which continue to play a role in tackling the pandemic. In order to maintain this critical capacity this group should be monitored by government to identify any rapid policy interventions needed to support them. A long-term scientific solution to the COVID-19 pandemic, and future pandemics more widely, will need a range of actors working together, including SMEs who are particularly vulnerable.

Research intensive SMEs in the chemical sciences have clearly demonstrated that they can operate COVID safe. Government should consider sector specific conditions when deciding on business or sector closures in a future wave. If locked down, financial support will be critical to research intensive SMEs to retain talent and ideas within the UK economy and support future economic growth.

We welcome that research has been allowed to continue in SMEs in a COVID-safe way during the current lockdown period.

Finally, I want to highlight a positive lesson learnt that has been raised by several members of our community. The pandemic has had a huge impact on many aspects of UK industry, academia, people and livelihoods. The R&D sector has been working to deliver solutions to contribute to the pandemic response and innovation has moved at an unprecedented pace, as exemplified by the recent announcements of intermediate results from stage three clinical trials from three vaccine candidates – a process which has previously taken several years. Within the innovation space there may be lessons learnt that can harness some of the mechanisms that have enabled this rapid pace of development and build it into 'normal times'. Examples of interventions which have aided innovation and development at this time from our community include the Government stepping in as first customer for therapeutics, diagnostics and vaccines, and the ability to carry out development stages in parallel without compromising on safety.

I sincerely hope that these points will prove useful to the committee. If you require anything further, please do not hesitate to contact me.

Yours faithfully,

Hannah Macdonald
Programme Manager – Health
Science Policy Unit

[1] Coronavirus and SMEs in the chemical sciences, Royal Society of Chemistry, April 2020