RSC Response to the RCUK Efficiency and Effectiveness of Peer Review Project

The Royal Society of Chemistry (RSC) welcomes the opportunity to comment on the Research Councils' *Efficiency and Effectiveness of Peer Review Project'*.

The RSC is the largest organisation in Europe for advancing the chemical sciences. Supported by a network of 43,000 members worldwide and an internationally acclaimed publishing business, our activities span education and training, conferences and science policy, and the promotion of the chemical sciences to the public.

This document represents the views of the RSC. The RSC's Royal Charter obliges it to serve the public interest by acting in an independent advisory capacity, and the RSC is happy for this submission to be put into the public domain.

Executive Summary

- The RSC considers the peer review process to be an effective mechanism for the allocation of research funds in the UK
- The RSC agrees with the 20 – 50% target success window for funding as proposed in the RCUK report
- Institutional consolidation grants are not considered an effective mechanism for the distribution of research funds.
- The RSC does support Platform and Portfolio grants for highly successful research groups, but only when balanced appropriately with responsive mode peer reviewed funding.
- The RSC is strongly opposed to institutional-level quotas as a means of improving the peer review process. Such measures will lead to higher institutional peer review costs and disadvantage early stage researchers.
- The RSC supports the proposal to control resubmissions and recycled proposals, however, implementing this could be problematic.
- The RSC supports the continued use of outlines in targeted programmes, but not in responsive mode peer review. It is thought that it will lead to longer submission to funding times and to an increase in the number of proposals submitted.
- The economic impact of research proposals must be judged only in the long term, and the backing of applied research simply for short term economic gains should be avoided.
- The RSC suggests that the current grading scheme for grant proposals could be used to implement short term disincentives to control resubmissions and applications from researchers consistently submitting lower quality proposals.

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Introduction and General Response

The RCUK '*Efficiency and Effectiveness of Peer Review Project'* has identified potential ways of decreasing the overall effort devoted to peer review of research proposals whilst maintaining a high level of quality.

The RSC recognises the success of peer review funding, and notes that in the RCUK report it is stated that over 93% of university researchers agree that it is a worthwhile activity despite the number of unsuccessful applications. In addition it is stated that 70% of researchers and almost 85% of administrators believe the Research Council peer review process to be excellent or good.

The annual cost of the peer review process is estimated to currently cost a maximum of £196 million. The RSC recognises the achievements of the research Councils in decreasing administration costs to only 4%, which is highly favourable compared to other UK and overseas funding bodies.

The number of proposals per annum has doubled between 1988/89 and 2004/05. This, however, has been accompanied by an increase in applicants of 15% over the same period (HESA data). SERC/EPSRC data also shows an increase in the number of applicants over that period from 2,361 to 4,812, and that the mean number of applications per applicant has only increased from 1.35 to 1.5 per annum over the same period. As recognised in the RCUK report, since 1988/89 funding available to the Research Councils has risen from £665.2 million to £2456 million and this has led to an increase in research volume.

Over the period 1988/89 to 2004/05 funding success rates across the Research Councils have fallen from 41% to 28%, and are anticipated in 2012/13 to be 25%. The RSC agrees with the target success window of 20 to 50% as a way of maintaining community morale and retaining competition. Action should be taken to avoid a drop below 20%, which is predicted to be the case by 2019/20 under the current system.

Considering the success of the peer review method, the low administration costs of the Research Councils and the current success rates the RSC considers that any changes to the peer review method need only be minor ones. Any changes are likely to be targeted at either decreasing the preparation and peer review times or by decreasing the number of proposals submitted.

As cited in the RCUK report, the 2004 Science and Innovation Framework stated that the UK research base is *"one of the most productive and influential systems of publicly funded research in the world".* It is therefore essential that the high quality of the UK research base is maintained.

It is noteworthy that the RSC represents members who obtain the majority of their Research Council funding from the EPSRC, with some support coming from other research councils such as the BBSRC. The following responses to the specific consultation questions asked by RCUK must therefore be considered in this context.

Consolidation of Research Grant Funding

A greater proportion of research Council funding could be devoted to larger *research grants, which would be offered either to research groups, or to departments and/or institutions and could consolidate support for a number of projects within a single large grant. Investigators supported by such a grant would then face some restriction on further proposal submission, e.g. they may* not *be permitted to apply in responsive mode for the duration of the award. The aim would be to provide long-term and flexible support for leading research groups, departments or institutions, whilst reducing the burden incurred by the preparation and peer review of multiple proposals. In addition, or alternatively, the Research Councils could seek*

to increase the length *of research grants and thereby reduce the frequency with which grant holders need to apply for further funding.*

1. *How might such changes be implemented in a manner that would meet the needs of your organisation and the UK research base, whilst maintaining the characteristics of an efficient and effective peer review system?*
2. *What level and length of funding, relative to your current Research Council funding, would be required for your organisation to consider this option more attractive that the opportunities currently available in responsive mode?*
3. *What steps might Research Councils and research organisations take to ensure that more use of larger or longer-term grants would not reduce innovation and dynamism within the research base, and the support of new people and ideas?*

The RSC supports the EPSRC funding schemes that currently provide longer term funding for research groups, such as Platform Grants and Portfolio partnerships. There is a definite need, however, to keep consolidation at an appropriate level so as not to adversely affect the UK research base.

The majority of EPSRC responsive mode funding should remain as it currently stands, with only a small number of long term consolidation grants being awarded. There is concern that consolidation grants could result in individual researchers and institutions struggling to carry out research due to a lack of funds if such longer term grants are not obtained.

If consolidation grants are awarded to institutions rather than individual researchers, then steps must be taken to avoid biased distribution of research funds within the institute, which could have a negative impact on, for example, early career researchers. A potential solution to this problem is for institutions to appoint 'external examiners' who would monitor the distribution of research funds. It is highly likely that institutional consolidation grants will be accompanied by an increase in institutional level costs as a result of an increase in internal peer review processes and greater project management and administration expenses. These could negate the cost savings made at Research Council level.

With regards to the quality of science, institutions do not have the breadth of research skills and knowledge to introduce effective internal peer review processes. In addition, many managerial posts in Universities are held by research active academics who would therefore have a vested interest in the allocation of research funds. Both of these issues also highlight the strengths of the current responsive mode peer review process operated by the research councils.

Such grants could also lead to a biased distribution of funds across the UK research base, with larger, more established, institutions increasingly dominating. It could also lead to a decrease in the number of collaborative grants between research institutes and, within collaborative projects, a significant biasing of research terms imposed by those institutes holding the majority of the funding on those that hold a lesser amount.

If larger and longer grants are to be implemented then the RSC would oppose the introduction of a complete ban on responsive mode funding for grant holders, as this could stifle innovation within the chemical sciences. Significant cost savings can still be made with only partial restrictions imposed.

The introduction of large grants could also damage the research base as a whole, by tying up large sums of money in selected institutions. This could be a barrier to improving institutions or early stage researchers who could struggle to gain such grants.

The RSC backs the continued use of Platform grants and Portfolio partnerships where researchers who consistently achieve high success rates are awarded greater funding in order to alleviate the burden of proposal preparation. Such researchers could be initially selected by the Research Councils based upon, amongst other factors, proposal success rates and subsequently invited to submit consolidation grant proposals. Longer grants need to be a minimum of 5 years duration in order to have any impact on researchers and the Research Councils.

Institutional-level quotas

A quota could be established for the maximum number of proposals each institution could submit during an identified period of time. The aim would be to control the number of proposals submitted to the Research Councils, and thereby the burden on the research community incurred by their preparation and peer review. One variant of this option might be to apply it to only institutions with the lowest success rate.

4. *How might this change be implemented in a manner that would meet the needs of your organisation and the UK research base, whilst maintaining the characteristics of an efficient and effective peer review system?*
5. *What steps might Research Councils and research organisations take to ensure that institutional quotas do not result in a comparable or increased level of peer review cost due to the establishment and operation of selection processes within research organisations?*
6. *What steps might Research Councils and research organisations take to ensure that institutions would continue to submit proposals for collaborative, high risk and interdisciplinary research and proposals from early-career researchers?*

The RSC does not support institutional level quotas as a method for improving the effectiveness and efficiency of the peer review process. Its introduction could create an uneven playing field for UK researchers and be detrimental to the responsive mode funding method.

The RSC believes that the introduction of institutional quotas would result in the establishment of selection processes within individual research institutions, thereby undermining the administrative cost savings at Research Council level. Quotas may also have a negative impact on the diversity of the UK research base, with more established institutions, and senior researchers within those institutes, holding a significant percentage of the quotas. In particular, early stage researchers and those researchers who have had several unsuccessful research proposal applications may be treated unfavourably by the quota system.

As with consolidation grants, internal peer review processes will not have access to the breadth of knowledge and skills that the research councils do, thus potentially having a negative impact on the nature of the science funded.

Controlling Resubmission/Recycled proposals

Research Councils would introduce measures to control the number of proposals that, following an initial unsuccessful pass through the full peer review process, are modified and then resubmitted. In one variation all resubmissions would be prevented, in another only "invited" resubmissions would be allowed.

7. *How might the Research Council best manage resubmission from the research community? In particular, what steps could be taken by Research Councils to distinguish between a resubmitted proposal and a genuinely new proposal?*

The RSC supports the principle of controlling resubmissions as a way to decrease the number of applications per year to the Research Councils. This could make a contribution to decreasing both Research Council administration costs and the burden of peer review. It should be noted, however, that the 'economic cost' of resubmission is significantly less than new proposals and so savings are limited. A significant barrier to enforcing controls on resubmissions is the difficulty associated with defining what is a resubmission and what is a new proposal.

Feedback on declined proposals is also useful for researchers, and resubmission following revision is an effective mechanism present in the peer review process to improve the quality of grant applications and assist in ideas generation. The feedback mechanisms could be made more effective in order to aid academics in improving the quality of their submissions.

Greater Use of Outlines

Short outline proposals, comparable to those currently used in some directed programmes would be required for responsive mode proposals. These would be subject to a light-touch peer review, which would inform a substantial sift or triage. Full proposals would only be accepted from among the outlines selected. The aim would be to reduce the time spent on the preparation and peer review of detailed proposals, and thereby the overall burden of peer review.

8. *How might this change be implemented in a manner that would meet the needs of your organisation and the UK research base, whilst maintaining the characteristics of an efficient and effective peer review system? For example, how might any potential impacts on increasing the time taken to fund new research or reduced effectiveness in identifying the highest quality research proposals be minimised?*
9. *What impact would the greater use of outline proposals have on the number of outline and full proposals submitted to the research councils, both within your organisation and across the UK research base?*
10. *What steps might Research Councils and research organisations take to ensure that the overall time saved on the preparation and peer review of full proposals would be greater than that incurred by an increase in the number of outline proposals?*

The RSC does not consider the use of outlines in the responsive mode peer review process to be a viable option for making significant cost savings. The RSC does, however, believe that they remain a valuable component of targeted programmes.

The current funding method, where the RAE and the level of funding awarded from Funding Councils to Departments is linked, results in pressure from Universities on academics. This was highlighted in the RCUK report by a quote from Eric Thomas, Vice-Chancellor of Bristol University: *"The incentives are to go for as much grant income as possible and probably to go for as much research council income as possible."*

If introduced in responsive mode funding this option is likely to result in a large increase in the number of these shorter funding applications submitted. Other concerns include a favouring of 'essay writers' over rigorous proposals, the likelihood that outlines will take more than 25% of the preparation time despite being a quarter of the length, and a significant increase in time from the initial proposal submission to the awarding of research funds.

Assessing potential economic impact

11. *Without compromising research quality, how could Research Councils develop the peer review process to ensure that potential economic impact is effectively reflected within proposal assessment?*
12. *How can Research Councils ensure that reviewers have the skills, experience and information necessary to assess effectively potential economic impact?*

When considering methods to assess the potential economic impact of proposed research the need to maintain the UK's strong science base and to continue to provide a high level of training must be borne in mind. The provision of highly qualified scientists from a strong scientific environment is essential for the economic growth of the science and technology sector in particular and the UK in general. This long term view is significantly more important than the short term assessment of an individual research project's economic impact.

Research in subjects like chemistry, physics and maths is often further from the market than research in engineering disciplines. Consequently it is more difficult to make judgements on the economic impact of chemistry proposals than engineering proposals, especially in more basic areas. On the other hand the chemical sector continues to make a significant contribution to the UK economy. To imply that all research should have a measurable and predictable economic impact will be damaging to the UK's economy in the long term as

proposed research will be steered towards more applied areas in order to maximum the funding chance.

The RSC believes, however, that more applied research in subjects like chemistry should be subjected to some measures of potential economic impact. Targeted programmes provide a valuable resource for providing societal, and potentially economic, benefits. Currently, for example, the SUPERGEN consortium is concerned with all aspects of energy research. Grant applications for research in such targeted programmes should have a high funding success rate. For the preservation of a strong scientific base, however, the balance between targeted programmes and responsive mode funding must be set appropriately.

A balance of academic and industrial referees provides a balance of research expertise and commercial knowledge appropriate for judging grant proposals. Training for referees to try and bring additional expertise in economic impact would be costly and not beneficial. Referees are already experts in their respective areas and it is the balance of review panels and referees that needs to be monitored.

The peer review process should aim to fund the best science possible. Currently many EPSRC committees and advisory boards contain members from industry, and this should continue. The Research Councils should not direct academics into carrying out more applied research simply for short term economic gains.

General Questions

13. *If the four options were to be implemented in the manner you have suggested which would you recommend?*

The RSC believes that introducing proposal quotas and, outside of targeted programmes, increasing the use of outlines does not represent an effective way to improve the peer review process. The RSC welcomes the idea of controlling resubmissions but suggests that the practical difficulties associated with this indicate it is also unlikely to be effective.

Consolidation of research grants represents a route towards improving the efficiency and effectiveness of the peer review process, although significant safeguards must be implemented.

14. *The Project Board considered that selective disincentives for individuals, or organisations, with particularly low success rates may offer a way to improve efficiency but considered that charging for proposals would not produce material savings.*

There is some scope for the use of disincentives as a method for controlling the number of responsive mode grant applications to the Research Councils. It is likely, however, that short term gains will be negligible. The report details three models in which one, two or three failed applications within one year results in a 12 month ban on further applications. With a 28% success rate then there is still a significant chance that a researcher submitting three strong proposals a year may still not get any funding, which would unfairly lead to a 12 month ban. Using this 3 failed submissions model the annual savings only amount to £1.7 million, a very small fraction of the £196 million total costs. Increasing the number of failed applications before a ban, however, would have little effect on the system and further decrease the financial savings.

The RSC does not back the concept of charging for grant proposal submission as these costs will simply be met from future grants awarded by the Research Councils themselves.

15. *Are there any options not mentioned in the report that you consider would enhance the efficiency and effectiveness of the RC's peer review processes?*

Decreasing the number of proposals submitted will help improve the efficiency and economics of the peer review system, particularly if it is the lowest quality proposals that are eliminated.

This could be achieved using the current grading system and subsequently controlling resubmissions or imposing disincentives. Proposals graded below a certain level could be barred from resubmission within a set period of time, such as 6 or 12 months. Alternatively, applicants consistently submitting poor quality proposals that obtain low grades could be prevented from submitting proposals for 12 months. These measures are similar to the disincentives proposed in the RCUK report, except that they rely on the quality of the proposals rather than success rates.

It would be essential and beneficial, however, for these changes to be accompanied by dissemination of best practice guidelines, thereby improving the standard of grant applications. This could also be implemented with regards to the final report evaluation in an analogous fashion. Researchers who have a set number of poor final report assessments within a time period could face a 12 months ban on proposal submission.

As is currently in place, researchers should still retain the ability to appeal against low grades or disincentives being applied if it was felt they had been unfairly treated by reviewers. In the long term this could help prevent poor quality proposals from taking up substantial amounts of administrative costs.

The RSC, whilst opposed to the introduction of internal peer review processes at research institutes, believes that there is a role for more senior academics to advise on grant preparation and this should be encouraged by the Research Councils.