

Response to the RCUK consultation on the *Efficiency and Effectiveness of Peer Review*

The Royal Society is pleased to respond to RCUK's consultation on the *efficiency and effectiveness of peer review (RCUK 2006)*. This submission has been developed in consultation with a small group of Fellows and Society award holders (listed at Annex A) and approved by the Physical Secretary on behalf of the Council of the Royal Society. Before addressing the specific proposals in the consultation document, we make a few general comments. We would be happy to expand further on the points in this submission or to meet with RCUK to discuss the issues.

Key Points

- The high number of grant applications should be viewed from a positive perspective, as it is indicative of the high number of ideas for research possibilities within the UK.
- Peer review is the only effective way of properly assessing the quality of research proposals. But it is a time-consuming process, so proposals to reduce the burden are welcome.
- The low ratio of grants awarded to applications, which leads to the need for researchers to submit multiple applications in the hope of one funding success, is not the result of a fault in the assessment system. Rather, this low ratio of grants awarded is due to intense competition for a limited pool of funds.
- Any moves to change the peer review process for research councils will need to be considered in the light of planned changes to the way Higher Education Funding Council funds are allocated post 2008.
- The consolidation of grants (ie the creation of longer and/or larger grants), while a powerful tool for funding high-risk science, must be considered carefully if it is not to discriminate against early career researchers or rapidly developing areas of research.
- Institutional quotas are a potentially damaging idea, and would be likely to produce an ossified HE sector in which current investment patterns are fixed. Academic decision making in HE institutions must not be confused with proper disinterested peer review.
- We support a greater control of resubmissions, as it is in everyone's interest to remove less competitive proposals from the system as soon as possible. However, improvements to proposals based on reviewers' feedback are a vital part of the scientific process, so invited resubmissions should be accepted. Careful categorisation of grants in terms of their potential competitiveness is key to the successful implementation of this strategy in terms of improving system efficiency without reducing the overall quality of the science funded.
- Providing that it is carefully implemented, we welcome the move towards using outline proposals for initial assessment, as it will allow feedback to be addressed more quickly, and will reduce time spent on calculating detailed costs for proposals that are not then funded.

General comments

The Society is a strong supporter of peer review as the most effective and respected way to assess the quality of research outputs. In our response (RS 2006) to the recent DfES consultation on the reform of higher education and funding (DfES 2006), we made that point strongly. Peer review is an open, transparent, and fair process, and is strongly supported by academics. We are particularly concerned that the proposed changes to university funding are taken into consideration as RCUK considers the way forward on peer review. We would encourage RCUK to communicate with HEFCE and other relevant organisations as necessary, to ensure that the combined impact of any possible changes is fully understood before any changes are implemented.

For a peer review system to be effective, it is crucial that the peer review process is well carried out. Therefore the work of peer review must be appropriately recognised and rewarded, and should be viewed as an important and central part of the academic's role.

The high number of grant applications should be viewed from a positive perspective, as it is indicative of the high number of ideas for research possibilities within the UK. We do not want to discourage good scientists from having good ideas and seeking funding for them. The high ratio of applications to grants awarded could be addressed in two different ways. The number of, or effort associated with, applications could be decreased or the number of grants awarded could be increased.

We are concerned that a low success rate for applications is assumed to be the result of a flaw in the peer review system. Many of the 'failed' applications have been graded highly by peer review, but the funding is not available to cover them. This is not a failing of peer review.

Further we question the assumption that all effort expended on a subsequently unfunded grant is wasted. Much of the calculations of costs, and the details of the research programme may not be used again, but literature reviews and preliminary studies are essential features of academic work and have intrinsic value.

Finally, we question whether the peer review burden is the most appropriate factor to influence a switch between different types of grant funding assessment. Surely the primary criterion must be to choose an assessment mechanism that is able most accurately to identify research proposals that will deliver high impact, novel science. It could be helpful if RCUK could carry out a study to compare the effectiveness of different mechanisms for assessment eg use of outlines compared to the use of full bids.

Responses to the suggestions raised in the consultation

Consolidation

- 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?*

The consolidation of grants may occur at two levels: to research groups, or to departments/institutions. We are not convinced by the arguments for consolidation at the departmental or institutional level. It could be a powerful tool for funding high-risk science, but is highly likely to discriminate against early career researchers

or fast-moving areas, and to ossify the UK research environment. We are also concerned that consolidating research council grants at the level of departments or institutions could diminish the distinctive role of research councils as responsive-mode funders. We further believe that an institutionally consolidated system would tend to replicate HEFC-type allocation, thereby substantially weakening the dual support system.

We welcome consolidation to the level of research groups, as long as the decision-making process is both rigorous and transparent, and not to such an extent that individual researchers cannot compete for grants. This kind of consolidation would guard against the need to break up coherent pieces of work into smaller grants, and allow more freedom to group leaders. At this level, increasing the duration of grants would be more important than consolidating institutional income.

A move towards consolidation of grants to research groups would need to be carefully managed to ensure that opportunities for researchers and new research groups to break into the system are not limited. Immediately after the introduction of consolidated funds, the number of applications for such funding is likely to be high, as the reward will be more valuable. Alongside this, it will be crucial to be open about criteria and decision making, as well as providing feedback at all stages of the process. We suggest that applications are reviewed by experts from several different disciplines, who would be provided with a nominated applicant contact to answer any questions. Interim reports would also be important in monitoring progress. There will also need to be an option to divert funds to different projects on a similar theme if deemed appropriate. With appropriate measures such as these in place, we believe that the consolidation of grants could have a positive impact on the peer review process.

- 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 than the opportunities currently available in responsive-mode?*

The Royal Society does not receive Research Council funding. However, we believe that grants of 5 years' duration would be required at a minimum, with perhaps the option of an extension to 7 years. For longer grants there might be a need for a progress review or a reapplication process at some stage, but this could tend to erode efficiency gains, unless the process is light touch.

- 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?*

We are pleased that RCUK is seeking to maintain innovation and dynamism in research. The use of longer-term grants could in itself have a positive effect on innovation and dynamism: the increased timeframe should encourage more risk-taking, and give principal investigators (PIs) freedom to explore questions that arise as the project develops. Consolidating grants may also have positive effects outside the reduction in peer review burden: for example, it will increase job security for research staff, who could then be employed on 5+ year contracts (rather than 3 years).

In terms of proactive steps that may mitigate the negative effects of consolidation, Research Councils may wish to consider ensuring there is a mix of senior and junior staff within larger proposals. Either each tranche of consolidated funding would need to have a specific allocation for high risk science, or separate pump-priming funding should be available. The criteria for concurrent responsive mode funding may need to be reconsidered, perhaps with a limit on the number of awards any PI could hold.

Quotas

- 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?*

The Royal Society does not receive Research Council funding. We would be very concerned by any move towards setting a quota on the number of research proposals accepted from any given institution. We do not feel this would reduce the burden of peer review, but merely move it to within the institution, which would neither be a healthy transfer, nor work towards the stated aim of increasing the efficiency and effectiveness of the peer review system, as outlined in RCUK's consultation document. The needs of an institution do not always coincide with the best science, so giving such power to the institution could lead to decisions being made on criteria other than excellence in science. It is important not to confuse academic decision making with peer review. HE institutions certainly have to engage in academic decision making, but are not well placed to conduct disinterested peer review. In individual institutions, relevant high-level expertise may not always be available and even if it is available will not be disinterested. If expert advice is to be brought in from outside the institution there is of course no reduction in the overall peer review burden. We believe that such a system will cause resentment within institutions and most importantly be responsible for very significant stagnation in the research system. Finally, we are concerned that there will be serious implications regarding the attracting of PhD students, as students are likely to choose to study at institutions where they stand a better chance of receiving post-doctoral funding.

- 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?*

We are not in favour of the use of institutional quotas, however if they are introduced, the selection process within institutions would need to be conducted in a fair, open and transparent way, so the overall costs of peer review will not decrease, just move. The set-up and maintenance of a properly balanced (in terms of discipline and career-stage) internal panel would be resource intensive and not provide disinterested advice. If the use of internal selection procedures led to a decrease in the overall burden, concerns may be raised regarding the robustness of the internal selection procedures used.

- 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?*

We believe that setting a limit on the number of applications submitted will inevitably discourage proposals for more risky research and from early-career researchers. If quotas are to be introduced (and we would not support this move) exempting early-career staff from any quota would be a positive step.

Resubmissions

- 7 *How might the Research Councils best manage resubmissions 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?*

We are in favour of measures to control resubmissions. We consider there are four types of proposal:

- less competitive,

- competitive with appropriate reworking,
- competitive as is, but which missed funding due to financial limitations on the overall pot, and
- competitive and funded.

The first two types outlined above should be separated and treated in different ways. It is in everyone's interest to remove the less competitive from the system as soon as possible (see 'outlines' section), and not to allow resubmission. The potentially fundable will benefit from the feedback provided, and could be invited to be resubmitted for consideration in a future round. Such an application would need to be accompanied by details of the changes and the justification for consideration. Those proposals that have been classed as high quality, fundable science, but for which funds have not been provided, could remain upon the table to be considered in the next round. These four categories could be added to peer-reviewer response forms so that reviewers can aid categorisation.

Outlines

- 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?*

We support the increased use of outline proposals for initial assessment. Such outlines should be assessed against a specific and limited set of criteria, and would need to provide sufficient information to allow a proper judgement to be made. We suggest that outline proposals for the responsive mode should be accepted at any time, and that the initial decision should be made quickly.

It will be important to structure such a process so that the rules for determining the number of applications to progress to the next stage are clear: eg fixed percentage of applications, fixed percentage (>100) of the number of applications to be funded, or all those outlines that have the potential to be fundable. The panel could also be asked to identify a proportion of high-risk proposals to be taken forward to full peer review.

- 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?*

The Royal Society does not submit proposals to Research Councils. Across the research base, while there is the obvious potential to increase the number of outlines submitted to Research Councils, we are not convinced that the numbers will rise dramatically. In addition, as long as the progression criteria are set appropriately, the number of full proposals should decrease.

- 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?*

Elements of outline proposals should be suitable for a generalist scientific audience, and should be of limited length, although they would need to provide sufficient information to allow a proper judgement to be made. This would allow a cross-disciplinary initial assessment panel to sift on potential, rather than cost. The outline should be simple to complete by applicants, and the inclusion of preliminary data would be encouraged. Full proposals would be reviewed as they are currently. While the track record of experienced researchers will be

of value when considering proposals, care will need to be taken to ensure that any measures which are introduced do not discriminate against younger scientists, or against novel/early stage proposals.

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?*

We are in favour of an assessment of the socio-economic impact of a *funding stream*, once outcomes and impacts have had time to settle. However there are many types of research proposal, and it is not appropriate for all types to be treated the same – an economic assessment may be appropriate in some cases, but not in others. Some research proposals, particularly those with industry links, will need to include a consideration of matters such as potential socio-economic impact. We do not feel it is appropriate to attempt to assess individual responsive-mode research proposals for potential socio-economic impact. Such an assessment could also discriminate against basic research in (for example) pure mathematics, ecology and astronomy. We do not consider that less-ambitious science should be funded on the basis of its potential wealth generation. In addition, we do not feel that such an assessment can be made with any degree of certainty or accuracy. Finally, although we do not believe that an assessment of economic impact is appropriate in all cases, if any such assessment is adopted, we would strongly advise a wide definition of socio-economic impact, which includes quality of life, environmental, and other indirect economic impacts. If a decision must be made between two proposals that are identical in terms of science quality, their wide ranging socio-economic impact could be considered.

- 12 *How can Research Councils ensure that reviewers have the skills, experience and information necessary to assess effectively potential economic impact?*

Either panel members should receive training in how to recognise potential socio-economic impact, or people with experience of identifying potential economic impact would need to be appointed to the panel to add that expertise. However, we believe that in the long term, positive socio-economic impact will result from funding the best projects as judged on scientific merit.

General Questions

- 13 *If the four options (i.e. consolidation; institutional quotas; controlling resubmissions; greater use of outlines) were to be implemented in the manner you have suggested, which would you recommend?*

We believe that increasing the use of outline proposals, and controlling resubmissions, would be helpful measures. A degree of consolidation (larger and longer grants) would also be positive if applied carefully at the level of the research group. We are strongly against the introduction of institutional quotas. Whatever changes are implemented, it is important that it is done in the context of other recent and planned changes, such as the introduction of the full economic cost regime, the single pay framework many institutions have introduced, and the changes planned for the other leg of dual support (HEEFC) post 2008. It will then be important to wait for the system to react, which may take considerable time, before assessing effects.

- 14 *The Project Board considered that selective disincentives (pp 61 -62) for individuals, or indeed organisations, with particularly low success rates may offer a way to improve efficiency but considered that charging for*

proposals (pp 63-64) would not produce material savings. We would welcome your views on these conclusions and your input on the types of disincentives (including charging) that you thought would be effective and how they could be best applied.

We do not support the concept of a disincentive to apply for research funding, whether it be institutional or individual. This would be a very risky measure. Any perceived abuse of the system is not obviously deliberate. We believe that allowing institutions to be aware of their own success rate may be helpful, to set up internal mentoring or coaching. More broadly, rather than disincentivising an unwanted behaviour it is more productive to incentivise the preferred behaviour. In this context, the provision of training and advice on grant preparation would be a better course of action for Research Councils. It could also be helpful for Research Councils to specify where the money saved by increasing the efficiency of peer review will be reallocated – whether or not it will be used to fund additional grants.

- 15 *Are there any options not mentioned in the report that you consider would enhance the efficiency and effectiveness of the Research Councils' peer review processes? If there are, please provide details.*

We believe that two truly independent referees with a good knowledge of a subject area are sufficient to assess whether most proposals should be funded, with a third brought in if the two disagree. However there may be occasions, such as a large interdisciplinary research proposal, where more than two reviewers will be necessary to assess the proposal effectively. We understand that this would require researchers themselves to respond to invitations to review grants more quickly for this to be effective. The system will only work well if there are clear and real incentives for reviewers to do a proper job (ie spend the appropriate amount of time on the task). We would also recommend that research councils consider the use of an interdisciplinary panel for assessment of outline proposals. The issue of the continuity of panel chairs may also need consideration.

References

DfES (2006) *Reform of higher education research assessment and funding*. DfES: London. Available online at www.dfes.gov.uk/consultations/conDetails.cfm?consultationId=1404

HM Government (2006) *Science and innovation investment framework 2004-2014: next steps*. HMSO: London.

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Annex A

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