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NIH Rating System

Although the attempts to standardize the evaluation and scoring procedures of grant applications (E. Marshall, *News & Comment*, 31 May, p. 1257) are well-meaning, they overlook a major limitation of the current review process: The scores given by individual study section members are not independent measures.

Typically, a grant application is considered in depth by two or three reviewers. They then present their reviews to the rest of the study section, discuss the pros and cons, and publicly announce their scores. Only then does everyone else record a score. Most of the study section members have not read the application under review and may not have a good understanding of the application from the discussion. As a consequence, the vast majority of study section members repeat the score of either the primary or secondary reviewer or split the difference. Without independent evaluations of the applications, statistically manipulating the

scores is not justified and will not improve the accuracy or fairness of the process.

At the least, two simple changes should be made. (i) Reviewers should only discuss the merits of the application and should not announce their scoring. (ii) Study section members who feel that they do not have a valid independent evaluation should not be required to submit a score (five independent evaluations are more valuable than 20 repeats). Once independence in scoring is achieved, it would be reasonable to adopt some of the standardized scoring techniques suggested by the Committee on Rating Grant Applications, although reviewers should only score on factors that they feel competent to judge.

The best way to improve the evaluation process would be to increase the number of independent evaluations. The length of proposals should be significantly reduced, and more reviewers should be assigned to each proposal. There is no need for any reviewer to write more than one page of critique, and it is not necessary to designate reviewers as primary, secondary, and so forth, which just encourages everyone to rely on one opinion.

Another way to gain more independent evaluations of a proposal would be to supplement the study section from a large pool of reviewers. Not every reviewer would attend a

given meeting, but the outside reviews (two to four) would be read and discussed at the study section (not the scores). Using an outside pool would also allow a better matching of the grant to the expertise of the reviewers and would involve more of the scientific community with the review process.

Our responsibility as scientists is to obtain unbiased estimates of variance in order to evaluate the significance of our findings. It is hard to understand why the same effort should not be made when scoring grant applications. The actual variance in the process may be high, but, if so, we should recognize this and devise a review process that deals with it in a statistically valid way.

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Risks from Low Doses of Radiation: Continued

The three letters published on 3 May (p. 631) challenge some of the statements in my 29 March Perspective (p. 1821), and I would like to address them here. The theme of my

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