

**Center for Scientific Review Advisory Council Meeting
National Institutes of Health
U.S. Department of Health and Human Services**

September 24, 2018

The Center for Scientific Review Advisory Council (CSRAC) convened at 8:30 a.m., Monday, September 24, 2018, at the Center for Scientific Review (CSR), 6107 Rockledge Drive, Bethesda, MD. The entire meeting was held in open session. Noni Byrnes, Ph.D., presided as chair.

Members Present

Noni Byrnes, Ph.D.

Jinming Gao, Ph.D.

Alfred L. George, M.D.

Yasmin Hurd, Ph.D.

José López, M.D.

Tonya Palermo, Ph.D.

Julie C. Price, Ph.D.

Jennifer West, Ph.D.

Denise Wilfley, Ph.D. (*ad hoc*)

Christine Melchior, Ph.D., was the executive secretary for the meeting.

I. Welcome and Introductions

Dr. Byrnes, CSR Acting Director, welcomed CSRAC members, CSR staff, and other attendees in person and via webcast to the 16th CSRAC meeting. She asked for a motion to approve the minutes from the March 26, 2018, meeting. CSRAC approved the minutes.

II. CSR Update

Dr. Byrnes highlighted CSR activities, the budget update, and several evaluations, and she discussed peer review integrity.

CSR News

- CSR Director Richard Nakamura, Ph.D., has retired.
- CSR hired 17 new employees in 2018 after hiring restrictions were lifted. Four more are pending, with eight more vacancies to fill.
- Seven video-streamed orientations were held for incoming study section chairs during the summer. Participants provided positive feedback on the sessions, which covered the role of the chair and Scientific Review Officer (SRO), fostering a culture of review integrity, and other topics.
- A redesigned website was launched based on user input.
- Staff updated the descriptions of more than 175 study sections. They now include scientific overlap statements so applicants better understand the scientific rationale behind study section assignments. Complaints about assignments have declined.

Budget Update

In fiscal year 2018, NIH received \$37.3 billion, with 82 percent going to extramural research. CSR's budget was \$135 million, 0.4 percent of the total NIH budget, a percentage constant for

the last five years. CSR continues to review 75 percent of all NIH applications, as well as many special initiatives and inter-agency collaborations. CSR reviews more efficiently than Institutes and Centers (ICs) as measured by the average number of days between receipt and release of summary statements.

Evaluation Updates

Commensuration Bias Study

This study looked at whether the criteria scores used in developing impact scores differed between black and white applicants. A small but statistically significant bias occurred but does not account for the larger scoring discrepancies reported in other studies.

Half-Point Scoring

This study looked at whether half-point scoring would reduce compression. The test did not improve compression for most study sections, and CSR will not implement half-point scoring.

Intra-IRG Ranking

This study looked at whether reviewer rankings of the top 20 percent of applications within an Integrated Review Group (IRG) reveal differences in the quality of science among the study sections. No critical differences were seen, although CSR will review the study design.

Early Career Reviewer (ECR) Program

Since this program began in 2011, 3,111 people have received training and served on study sections, 19 percent of whom were underrepresented minorities (URM) and 47 percent of whom were women. To date, 143 former ECRs are full members of standing study sections. More comprehensive analysis is planned. It will include any effect on R01 success rates.

Anonymization

This study will examine potential sources of bias related to race, gender, career status, and institution. A contractor is conducting the test on 1,200 applications, with completion anticipated in 2019.

New Framework for Study Section Evaluations

For more than 20 years, CSR has reviewed scientific review groups (SRGs). The review looks at how well the scientific scope of an SRG aligns with the current state of the science. Under the current process that began in 2015, CSR has conducted reviews of bioengineering, basic cancer biology, imaging technologies, and HIV/AIDS SRGs, with vision sciences next. Resulting changes include combined, new, or eliminated SRGs after CSRAC review.

NIH Director Francis Collins has convened a trans-NIH group, co-led by CSR and IC representatives, to develop a new study section evaluation process. It builds on what CSR has done and adds a process evaluation component, stakeholder engagement, and objective metrics.

Peer Review Integrity

CSR must ensure peer review remains free from inappropriate bias. Problems are rare, but NIH has taken steps to lead to more reporting and action of potential issues. For example, SROs have a required email signature line that explains how to report possible violations.

Discussion Highlights

- **Half-point scoring:** Jennifer West, Ph.D., and José López, Ph.D., asked for clarification on whether half-point scoring resulted in fewer ties. Dr. Byrnes indicated that it does.
- **Commensuration bias:** Julie Price, Ph.D., asked about the commensuration study. Dr. Byrnes and Mark Lindner, Ph.D., Director of the Office of Planning and Analysis, said that scoring was disadvantageous to African Americans in 5 percent of cases, and advantageous in 2.5 percent of cases. Researchers at the University of Washington confirmed the findings.
- **Intra-IRG ranking study:** Amy Rubenstein, Ph.D., SRO, responsible for the study, said a reviewer's expertise makes a small difference, but that was the only difference seen.
- **Communication about changes:** Jinming Gao, Ph.D., asked how NIH communicates results of the many studies. Tanya Palermo, Ph.D., urged going beyond the website. Yasmin Hurd, Ph.D., suggested targeted emails, and Denise Wilfley, Ph.D., suggested the Open Mike blog produced by the Director of the NIH Office of Extramural Research.
- **Peer review integrity:** In response to a question from Dr. López, Dr. Byrnes said confidentiality issues are the most frequent concern. Alfred George, M.D., said study section chairs must be proactive. Dr. Palermo suggested including examples of problems in training. Dr. Price noted the new chair training could include the topic, with examples.
- **Early career reviewers:** In response to a question from Dr. Hurd, Dr. Byrnes said 19 percent of the group who became chartered study section members were URM.

III. Managing Review Burden

Valerie Durrant, Ph.D., Director of the CSR Division of AIDS, Behavioral and Population Sciences, discussed reviewer burden and introduced two case studies.

Background

CSR is interested in better understanding the effect of recent changes to NIH review criteria and other review considerations prompted by NIH policies (e.g., clinical trials, and rigor and transparency) on reviewer burden.

Burden matters because it affects the availability and participation of reviewers, determination of workloads, and ability to focus on evaluation of the science and potential impact. The volume of information (more than 300 pages of reviewer instructions), increasing complexity of applications, and pace of change add to burden. Also, confusion can result from the advance announcement of coming policies that do not affect the current applications under review. Policy information and guidance differ across roles, since reviewers are also applicants. The implementation of policies also differs across science and types of applications, for example related to human subjects and vertebrate animals.

Two case studies were presented to illustrate how CSR manages reviewer burden associated with the changes to the clinical trials policy.

Case Study 1: Interventions to Prevent and Treat Addictions (IPTA) Study Section

Miriam Mintzer, Ph.D., SRO for IPTA, noted the study section has a high proportion of clinical trials (CTs), and all standing members conduct their own clinical trials. Reviewer burden results from longer applications, key information dispersed across multiple sections, redundant and sometimes conflicting information, expanded criteria for CTs, and limited reviewer time.

Strategies to minimize burden include the following:

- Assign fewer applications per reviewer
- Present CT policies and criteria as extensions of the Rigor and Transparency Initiative
- Focus training on scientific (versus administrative) aspects
- Provide feedback on critique drafts
- Keep communication clear and concise
- Respect reviewers' time throughout the review process.

Case Study 2: Auditory System (AUD) Study Section

In contrast, Ying-Yee Kong, Ph.D., said AUD reviews few CTs, and few members conduct them or have experience with human subjects. When they do have to review CTs, there can be confusion. Strategies to minimize reviewer burden include the following:

- Alert reviewers assigned to CTs and provide additional training
- Emphasize the big picture perspective
- Remind reviewers that not all additional review criteria apply to all science
- Recruit additional experts when needed, for example on biostatistics
- Offer opportunities to review and provide feedback on drafts of critiques before submission deadlines.

Discussion Highlights

- **Training:** Dr. López noted additional training also adds to burden. A lot is added to reviewer responsibilities, but nothing is subtracted. URMs are often selected for many boards and committees, which is important for diversity but increases burden on them.
- **Reviewer feedback:** In response to a question from Dr. Palermo, Dr. Durrant said CSR has received anecdotal feedback from SROs and chairs about burden. Dr. Palermo expressed concern for early-career clinical trialists. They get different feedback from different ICs, including some ICs discouraging Early Stage Investigators from submitting clinical trial R01s, which can impact the pipeline of CT researchers.
- **Challenges in recruitment:** Dr. George asked about the optimal workload per reviewer and major challenges in recruiting reviewers. Dr. Durrant said reviewers need to review enough applications in order to rank, but many express concern about all the non-science aspects of the applications they have to keep track of. Dr. Gao stressed the importance of allowing reviewers to focus on the science. Dr. Hurd suggested recruiting reviewers to focus on the administrative, biostatistics, and other non-scientific aspects of reviews to lessen the burden.

IV. High Risk/High Reward Reviews

Ray Jacobson, Ph.D., Biological Chemistry and Macromolecular Biophysics IRG Chief; Weijia Ni, Ph.D., Risk, Prevention, and Health Behavior IRG Chief; and Srikanth Ranganathan, Ph.D., Musculoskeletal, Oral and Skin Sciences SRO, highlighted CSR-coordinated reviews associated

with high-risk, high-reward grants funded by the NIH Common Fund. They include the Pioneer, New Innovator, Transformative Research, and Early Independence awards.

Transformative Research Award

This review has three phases: editorial review of all applications, expert review of a subset, and final review and assignment of scores. Dr. Jacobson described reviewers' roles and workloads in each phase. Eight awards were made in 2017. The 2018 recipients had not been announced.

Early Independence Award

Dr. Ni explained that this award is targeted at very early stage investigators and reviewed in two stages. Applicants must demonstrate potential for independence and substantial institutional support. The first stage is an electronic review by subject matter experts. Reviewers evaluate the potential impact to the scientific field and the promise of the PI. All CSR IRGs help recruit and assign reviewers. In the second stage, broad-vision scientific leaders form an editorial board, each reviewing 20–30 applications, then meet for final scoring.

Director's New Innovator (DP2) Award

Dr. Ranganathan said that this award is for exceptionally creative early stage investigators in one of nine broad scientific areas. About 500–600 applications are received each year, with a minimum of 30–35 awards made.

Applications include a 10-page essay with a focus on innovation, impact, and investigator qualifications. There are two review stages. After a mail review, about 20 percent of the applications are selected as finalists. Then, an expert panel with broad scientific understanding discusses and scores all the finalists. The Council of Councils makes recommendations for the final selection.

Discussion Highlights

- **Early Independence:** In response to a question from Dr. Hurd, Dr. Byrnes said the Council of Councils decided not to have the Editorial Board conduct interviews with Early Independence applicants. It would rely on information contained in the application and letters of recommendations.
- **Long-term impact:** Dr. George asked about tracking for long-term impact. James Mack, Ph.D., said an external evaluation of the Pioneer Award was conducted three years ago that showed enriched support for investigators had high impact. Placing all these programs under the Council of Councils will provide joint oversight and evaluation of how high-risk, high-reward support has a collective impact.

V. Accelerating Precision Medicine for All of Us

Joni Rutter, Ph.D., Director of Scientific Programs for the NIH All of Us (AoU) Research Program, said the 21st Century Cures Act provides \$1.455 billion over 10 years. The bulk of the portfolio is Other Transactions Authority (OTA) funding. Although not required in the legislation, All of Us has included CSR in the review process.

Dr. Rutter explained the mission, objectives, and major building blocks of the research program. Participants volunteer directly or through health care provider organizations, with two pathways to share electronic health records (EHRs). An AoU Genomics Platform is being established. The goal is to start with a simple protocol and grow over time.

Participants are involved as partners through an advisory panel, as ambassadors, and in a director's think tank. Researchers can access the data of a diverse cohort of participants. Privacy and security are built into data collection and usage. She reviewed current enrollment levels and three plans for 2019 that include a research portal, plans for the enrollment of children, and genomics.

Discussion Highlights

- ***Longitudinal bio specimens:*** Dr. Rutter said AoU is trying to be creative to work within a finite budget to collect longitudinal specimens.
- ***Role of pharmaceutical companies:*** Dr. Hurd noted companies will gain access to taxpayer-paid data and asked how they will give back to the public. Dr. Rutter said AoU will not sell data, but there are other costs, such as setting up large computes of the datasets and clinical trials, that companies will incur.
- ***Enrollment of children:*** In answer to a question from Dr. Palermo, Dr. Rutter said enrollment of children will be a phased approach in keeping with states' laws. They will start with young children because laws are more clear-cut than with adolescents.

VI. Expectations and Characteristics of the Peer Review of Grant Applications

Stephen Gallo, Ph.D., Chief Scientist of the American Institute of Biological Sciences (AIBS), said AIBS's Scientific Peer Advisory and Review Services Division has performed more than 50,000 expert peer reviews since 2007. AIBS not only analyzes data from their reviews to improve their processes, but also wants to contribute to the literature exploring the science of peer review, which has a limited evidence base.

Peer Review Effectiveness

AIBS analyzed 48 projects from the literature to see if they indicated that peer review is able to pick the best applications. As caveats, the total was small, fewer than one-half were U.S.-based, and most focused on bibliometric measurements. Many were ex-post validation, which means the lack of unfunded projects as a control group. Most studies indicated peer reviewers can discriminate between good and bad proposals, although it is more difficult to distinguish between excellent and outstanding ones, which is necessary with limited paylines. Another study looked at reviewer disagreement around applications, to see if disagreement indicates high-risk, high-reward research that may provide a huge return on investment. Based on their data, this assumption did not hold.

Many studies used number of citations as a measure of productivity. There are several caveats to this approach, including that some good funded studies yield negative results, which are difficult to publish.

Moving forward, validation studies must be multifaceted and not rely on one measure. Portfolio analysis is also important, such as looking at a grant mechanism over time. It is important to see if peer review is effective in measuring innovation. A standard objective measurement has not yet emerged. One survey showed reviewers felt they considered innovation and risk in their evaluations more than the applicants thought had occurred. This gap could relate to conservatism in peer review or a communication gap between reviewers and applicants.

Measuring the effectiveness in peer review is subjective and depends on who is asked. In addition to objective measures, it is important to understand stakeholders' perceptions of peer review.

Peer Review Efficiency

Another question relates to the efficiency of peer review. AIBS was involved in a review that shifted from face-to-face to teleconference-based meetings, with all else the same, so they compared the two methods. Scoring and standard deviation were similar. Discussion time was longer for face-to-face. Scores changed less after discussion in the teleconferences, possibly because of less panel engagement. Research needs to focus on whether moving to more efficient processes yields the same results. Prospective trials are also needed.

Related Issues

Related to rational decision making, data show a correlation in the intellectual distance of a reviewer and the application and the score given. Reviewers are bounded by the limits of their expertise and what is presented in a proposal. But this is exploratory and more research is needed. Decision-making models from other fields (including decision and team science) can also be applied to peer review data.

An AIBS analysis of conflicts of interest showed the presence of more conflicts than those self-reported by reviewers although most were minor, such as a reviewer and applicant at the same institution but with no interaction. However, no financial conflicts were self-reported, and as they are not listed on a CV, this may be a potential issue for the detection of a potentially impactful type of conflict.

AIBS surveyed reviewer motivation and participation. Although the survey found uneven levels of participation in reviews and response rate was low, it estimated people spend 3–5 percent of their time in journal and grant reviewing. As burden increases, the challenge is to sustain the process. More needs to be done to motivate and reward reviewers, perhaps using Publons as a model.

Future Directions

Dr. Gallo urged the following:

- More involvement from the academic community, including psychology, decision science, team science, and behavioral economics
- More transparency from research funders
- Funds to collect analyses and potentially prospective trials
- More consolidation of knowledge, such as literature reviews and reports across funding agencies

- More communication of results and interpretation by the community.

Discussion Highlights

- ***New models:*** Dr. Palermo agreed with the need to expand to new conceptual models of analysis, such as to look at the effect of expertise on scores.
- ***Prospective Studies:*** In answer to a question from Dr. George about setting up prospective studies, Dr. Gallo said it depended on which questions one would like to answer. For example, the same proposals could be reviewed in person versus via teleconference in a prospective study. More broadly, scientometrics is looking at what constitutes success in research, which would be crucial as an outcome measure for any prospective trial. Given the difficulty in creating such a measure, an alternative is to look at individual review processes to determine their validity (e.g., is the discussion fair? is the recruitment appropriate?).
- ***Lottery system:*** Dr. Price asked Dr. Gallo about his view of a lottery system for the highest grants. Dr. Gallo questioned whether reliability and fairness could be addressed.
- ***Control group:*** An audience participant said she was encouraged that most FDA-approved drugs began with NIH funding. Dr. Hurd said it is possible unfunded projects may have led to major cures and treatments. For this reason, the control group is critical.

VII. Outreach Plans and Priorities for CSR

Bruce Reed, Ph.D., Director of the CSR Division of Neuroscience, Development and Aging, made a presentation and asked for CSRAC feedback on messages, priorities, and approach.

The Outreach Committee is developing a more strategic approach to outreach. It has four messages for 2018–2019:

- CSR plays a critical role in promoting creative, high-quality science
- Peer review basics
- Communicating new and prioritized NIH/CSR policies, such as those related to rigor and transparency
- CSR is a great place to work.

Priority audiences include early stage investigators and underrepresented minorities. The committee is creating a list of priority venues, such as society meetings, and combining outreach with reviewer recruitment. They encourage collaboration with NIH program staff on outreach.

The committee offers resources to staff doing outreach, such as a new intranet webpage, core slides, and posters. It does not serve as a gatekeeper but can offer feedback to staff. It is collaborating with the National Institute of Minority Health and Health Disparities to develop presentations and other activities. They also plan to track activities. A 2019 goal is a list of scientific and audience-based meeting priorities. The Outreach and Communications committees work together closely.

Discussion Highlights

- ***Small versus big meetings:*** Dr. López noted in his field, small meetings, such as Gordon Conferences, are the most effective way to recruit reviewers. Dr. Reed agreed, but noted that

bigger meetings are often easier to reach ESIs. Dr. Hurd said targeting within larger congresses could be effective, such as minority task forces.

- **Communications:** Dr. Palermo suggested involving study section chairs in outreach and also outreach to institutions, including grants administrators, to communicate about policy changes. Dr. Price said the poster could be shared with younger investigators or those who feel distanced from CSR.
- **Messages:** In response to a question from Dr. George about including review integrity as a main message, Dr. Reed said the emphasis here is more on applicants. Dr. Gao said the messages seem more for congressional leaders than applicants. He suggested that the messages might be tweaked to appeal directly to applicants, for example by emphasizing that a review committee is a great way to advance their knowledge of the field, or by highlighting transparency at CSR. Dr. Reed agreed that the messages need to be tailored to the audience. Dr. López noted that all enterprises have myths surrounding them. Once known, they can be dispelled.

VIII. CSR Strategic Plan: Input and Discussion

Dr. Melchior shared an early draft of the Strategic Plan and asked CSRAC for feedback.

Discussion Highlights

- **Burden:** Dr. López expressed concern about applicant burden and suggested a systematic review of the grant process to streamline where possible.
- **The big picture:** Dr. Hurd said some administrative aspects could be shifted to time of award, which would reduce burden for applicants and reviewers. The minutia takes away from scientific impact. Dr. López expressed support to use the strategic plan to advance the concept of moving elements that do not require high-level scientific expertise outside the review process so that reviewers can concentrate on the science.
- **Clinical trials:** Dr. George supported the earlier idea of an expert in a review meeting to focus on the logistics of clinical trials. Dr. Hurd asked if clinical trials should have different scoring system than other R01s. She expressed concern that their complexity may discourage junior investigators from undertaking them. Dr. Palermo said R01 clinical trials have become more complicated and urged a systematic evaluation of what is really needed.
- **Mentoring and training reviewers:** Dr. George suggested chairs take ownership of mentoring new members, perhaps by relinquishing some of their reviewing workload or serving for a year after their service as chair. Dr. Hurd noted the burden on chairs is often not considered. Dr. Byrnes asked about specific problems seen, such as quality of the critiques or discussion, in order to develop resources to address them. Dr. George urged participatory, not static, training and also suggested a train-the-trainer approach. Dr. Byrnes said participants like to hear from experienced chairs, who could be vetted to ensure they provide accurate information and then help in the training. Dr. Price stressed the value of cases that people could discuss, including examples that cover integrity issues.
- **Future versus present:** Dr. George observed the draft document focuses more on current status rather than being forward looking. Dr. Hurd suggested bullet points that stress plans to go forward. In answer to a question from Dr. Palermo, Dr. Byrnes said the plan is due at the end of December to look ahead five years. She explained some of the plan's sections were

provided as a template for all ICs to complete. Dr. George suggested a final section that is forward-looking, with points of emphasis and tangible goals and processes.

- **Key issues:** Dr. Hurd suggested including core issues such as mentoring, integrity, and transparency. Dr. Gao noted workload as an issue, and the plan should include a de-burdening strategy for applicants, reviewers, and chairs. Dr. Wilfley said the field of implementation research refers to task-shifting, with the goal here to allow reviewers to focus on the science. Dr. George said relieving reviewer burden, applicant burden, and staff burden could each have action plans.

IX. Closing Remarks and General Discussion

Dr. Byrnes asked for final comments and questions. Dr. López commented on the importance of the topics under discussion. Dr. Gao asked about interface with the next director. Dr. Byrnes said that some elements of the strategic plan may change with a new director. She thanked CSRAC members for their involvement and service.

We do hereby certify that, to the best of our knowledge, the foregoing minutes of the September 24, 2018, meeting of CSRAC are accurate and complete. The minutes will be considered at the next meeting of the Advisory Council, and any corrections or comments will be made at that time.

Noni Byrnes, Ph.D.
Acting Director
Center for Scientific Review Advisory Council

Christine Melchior, Ph.D.
Executive Secretary
Center for Scientific Review Advisory Council