

Review of NRSA Fellowship Applications: Final Report of the CSR Advisory Council Working Group

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Background and Charge

- CSR is committed to "Implement changes to the peer review process to make it more fair, effective, and efficient" – CSR Strategic Plan 2022-2025
- CSR reviews >80% of the NRSA fellowship applications received by NIH.
- Persistent concerns that fellowship reviews may disadvantage some applicants who are in fact highly qualified led CSR in September 2021 to convene a WG on fellowship review, advisory to CSRAC.

Charge

• Evaluate the fellowship review process and making recommendations to make it as effective and fair as possible for all.



CSR Advisory Council

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Working Group Process

Charge meeting 9/20/21

Met 12 times over the next year, with additional subgroup meetings and online discussions

Obtained Substantial External Input

- Published a CSR Review Matters post calling for comments on fellowship review from the extramural community.
- Content analysis performed.
- WG requested and received extensive data from CSR on fellowship review and review outcomes
- Consultations with NIH Office of Extramural Activities
- Consultations with NIH Office of the General Counsel

Interim report to CSRAC on March 28, 2022, which endorsed the general approach. **Subsequent presentations**

- NIH Review Policy Committee
- NIH Program Leadership Committee
- NIH Training Activities Committee



CSR content analysis: Main themes of public blog comments

Concerns about bias

- Favors big name sponsors and schools, well funded labs
- Disadvantages early career sponsors, non-elite schools, women and under-represented minorities

Concerns about the information base in the application

- Eliminate the requirement for undergraduate grades
- Reduce emphasis on publications

Concerns about the application/burden of review

• The application is too long, cumbersome, duplicative, and not well aligned with review criteria

Requests for enhanced training

- \circ Mandate bias awareness training
- o Train reviewers to give constructive feedback and avoid demoralizing harsh comments



NIH Fellowship applications: Council Year 2021, N = 6676





Unknown

Applications are highly concentrated in a small number of institutions.







Applications from institutions that submit low number of fellowship applications have worse review outcomes







Review outcomes improve as the academic rank of the sponsors rises





Summary

- The extramural community is concerned that groups that are typically disadvantaged in science are disadvantaged in fellowship review, that it contributes to "the rich getting richer". In addition, there are concerns about how applicant qualifications are defined, and concerns about the content of fellowship applications.
- CSR data shows that fellowship applications are concentrated in a small number of institutions, suggesting that the knowledge and other resources that support writing a good F application are very unevenly distributed.
- Applications from those (highly resourced) schools do better
- Applications from senior scientists do better than those from those in earlier career stages.
- NIH is potentially leaving out highly promising young scientists because of a process that too heavily favors elite institutions, senior, well-known scientist sponsors, and an overly narrow emphasis on traditional markers of early academic success.



Recommendations

To improve the fairness and effectiveness of review, changes are needed in multiple components of the review process: criteria, application, reviewer training, outreach to applicants.

Major recommendations

- 1. Change the review criteria
- 2. Change the fellowship application (Fellowship supplement to the PHS 424)

Additional Recommendations

- 3. Consider partially-blinded review models
- 4. Target outreach to the institutions and applicants who need it most



Recommendation 1. Revise the criteria used to evaluate fellowship applications

Simplify review by reducing the criteria from 5 to 3, eliminating current criteria that focus on *Sponsor* and *Institutional Commitment*

- Better focus reviewer attention on 3 key assessments:
 - \circ $\,$ The potential, preparedness and goals of the applicant $\,$
 - The strength of the proposed science
 - Quality of the training plan and training resources
- Reduce bias in review by reducing inappropriate consideration of sponsor and institutional reputation.
 - Instead of a diffuse evaluation of the sponsor, evaluate how the sponsor will build the scientific skills and knowledge needed, and the role they play in the training
 - Instead of general institutional reputation, evaluate in the context of the training plan.



Recommendation 1. Revise the criteria

- Eliminate peer review of financial support for the proposed research
 - Source of support for the proposed fellowship is irrelevant to judging its merit
 - The careful evaluation, timely assessment of dynamic funding situations in the comparatively small number of applications that go forward for likely funding can be better done by program officers.



Proposed revisions to criteria

Current

- 1. Fellowship Applicant
- 2. Sponsors, Collaborators, & Consultants
- 3. Research Training Plan
- 4. Training Potential
- 5. Institutional Environment & Commitment to Training

Recommended

- 1. Scientific potential, fellowship goals, and preparedness of the applicant
- 2. Science and scientific resources
- 3. Training plan and training resources



Recommended criteria for the review of NRSA fellowship applications-1

Overall impact score: Score the overall scientific and educational merit of the proposal. Use the three review criteria defined below to judge how much the fellowship will enhance the biomedical research capabilities of the applicant and increase the likelihood they will become a productive research scientist.

1) Scientific potential, fellowship goals, and preparedness of the applicant

- Evaluate the breadth and depth of scientific understanding the applicant conveys in their statements.
 To what extent does the candidate articulate the importance of their science and demonstrate an ability to study that problem in a rigorous scientific manner?
- Evaluate the preparedness of the applicant to undertake the proposed training and their capacity to benefit from the fellowship. Evaluate their accomplishments in the context of their stage of training and the scientific opportunities they have had.
- Evaluate the applicant's scientific potential. Consider their trajectory in the context of their opportunities. Also consider other factors that bear on their potential to succeed, such as determination, persistence, and creativity.



Recommended criteria for the review of NRSA fellowship applications-2

2) Science and scientific resources

- Evaluate the quality of the proposed science. Assess the depth of understanding of the scientific background and the scientific rigor and feasibility of the approach.
- Evaluate the extent to which needed technical, scientific, and clinical resources are specified and are realistically available to the applicant.
- Assess whether the scientific expertise of the mentorship team is appropriate for the proposed science and whether the role of each mentor is clearly defined.
- Evaluate how well the proposed scientific project serves the applicant's training goals.



Recommended criteria for the review of NRSA fellowship applications-3

3) Training plan and training resources

- Evaluate whether the applicant clearly defines their career goals and whether the training plan is linked to them.
- Evaluate whether the applicant has clearly defined areas of needed growth and/or weakness. These could include specific scientific skills and knowledge and other professional needs such as communication, teaching, and mentorship skills.
- Evaluate the training environment for this applicant. Assess whether the necessary institutional training resources are well-specified and available, specifically the practical availability of resources.
- Evaluate whether the trainee articulated a coherent and cohesive plan for interacting with sponsors and mentors.
- Assess whether the sponsor presents a strong pedagogical plan appropriate to the needs and goals of the applicant. Please include an evaluation of the training philosophy of the sponsor, their approach to training, time commitments and their accessibility.
- Evaluate and comment on what impact completion of the training plan will make in meeting the scientific development needs of the applicant and aid them in achieving their career goals.



Recommendation 2. Revise the Fellowship Supplemental Section of the PHS

Review outcomes are determined both by the judgements reviewers are asked to make and information they are given—the application. Thus, review criteria and the application content should be aligned.

Specific recommendations

- 1. Eliminate grades
- 2. **Revise the Applicant Section** of the Fellowship Supplement to 5 statements, each wordlimited. (Reduces length from 6 pages to 4):
 - 1. A statement of professional and fellowship goals
 - 2. Fellowship qualifications
 - 3. A self-assessment
 - 4. Statement of scientific perspective
 - 5. Detailed account of activities planned under this award
 - \circ Details in WG Report, Appendix 1



Recommendation 2. Revise the Fellowship Supplemental Section of the PHS -2

3. Revise the Sponsor and Co-sponsor Section

- $\circ~$ Four statements, each word-limited, reduces length by $\frac{1}{2}$ page.
 - 1. Previous fellows/trainees
 - 2. The training plan, environment, and research facilities
 - 3. Number of fellows/trainees to be supervised during the fellowship
 - 4. Applicant's qualifications and potential for a research career

4. Revise letters of support

- \circ $\,$ Asks writer to address 4 questions
 - 1. 3 most important traits that will contribute to applicant's success
 - 2. 3 gaps or weaknesses of the applicant
 - 3. The intellectual contributions made by the applicant during training
 - 4. Overall assessment of readiness and potential

5. Allow an optional statement of special circumstances



Recommendation 3. Improve NIH outreach and reviewer training

Outreach

 NIH should target its outreach to the institutions and applicants likely to need it most.

Reviewer training

• CSR should consider creating a version of its peer review bias awareness and mitigation training tailored to fellowship review



Recommendation 4. Make changes in the review process to make review more fair

- Cluster applications to allow appropriate framing of criteria for early career sponsors and less-resourced institutions
- Withhold institutional identification until the end of the application Implementation would require 2-stage, partially-blinded review



Suggestions

1. Consider granting honorable mentions to meritorious applicants who do not receive NRSA awards

2. Broaden the range of career goals that are welcomed by the NRSA program





Thank you

To the entire working group and the CSR data analytics team





Discussion



