Preparation of a Competitive Proposal for the NSF Graduate Research Fellowship Program

Associate Dean Mulligan

Student Panel

Crystal Reynaga	Ecology & Evolutionary Biology
Amberle McKee	MCB/EEB
Amber Habowski	CMB/Cancer Biology
Lisa Baik	CMB/Cell Biology
Eva Morozko	INP/Neurodegenerative Disease
Freddie Marquez	INP/Brain Imaging & Cognition

Preparation of a Competitive Proposal

GRFP Overview

Resources

Review Criteria, Statements, & References

GRFP and Biomedical Research

Outreach Opportunities

Applicant Reviews

NSF GRFP Goals

- Increase U.S. capacity in science and engineering by providing fellowships for early-career graduate students to pursue research-based graduate degrees in NSF-supported disciplines
- Support development of a diverse and globally engaged science and engineering workforce
- Support promising future scientists that will have a societal impact
- Funds scholars, not research projects

GRFP Key Elements

- Five Year Award – $138,000
- Three years of financial support
  - $34,000 Stipend per year
  - $12,000 Educational allowance to institution per year
- International research opportunity through GROW (Grad Research Opport Worldwide)
- Access to XSEDE cyberinfrastructure resources

Deadline for submission in Life Sciences is Oct. 23!

GRFP Eligibility

- U.S. citizens, nationals, and permanent residents
- Early-career students (UG, 1st/2nd Yr. Grads), may not already have MS degree
- Pursuing research-based MS or PhD in NSF fields
- Enrolled in accredited U.S. institution by fall 2018
- Applicants must self-certify that they meet the GRFP eligibility criteria

For the 2017 cycle:

- Graduate students may submit in 1st or 2nd yr., **but only once**
- Submission while an undergraduate is not relevant

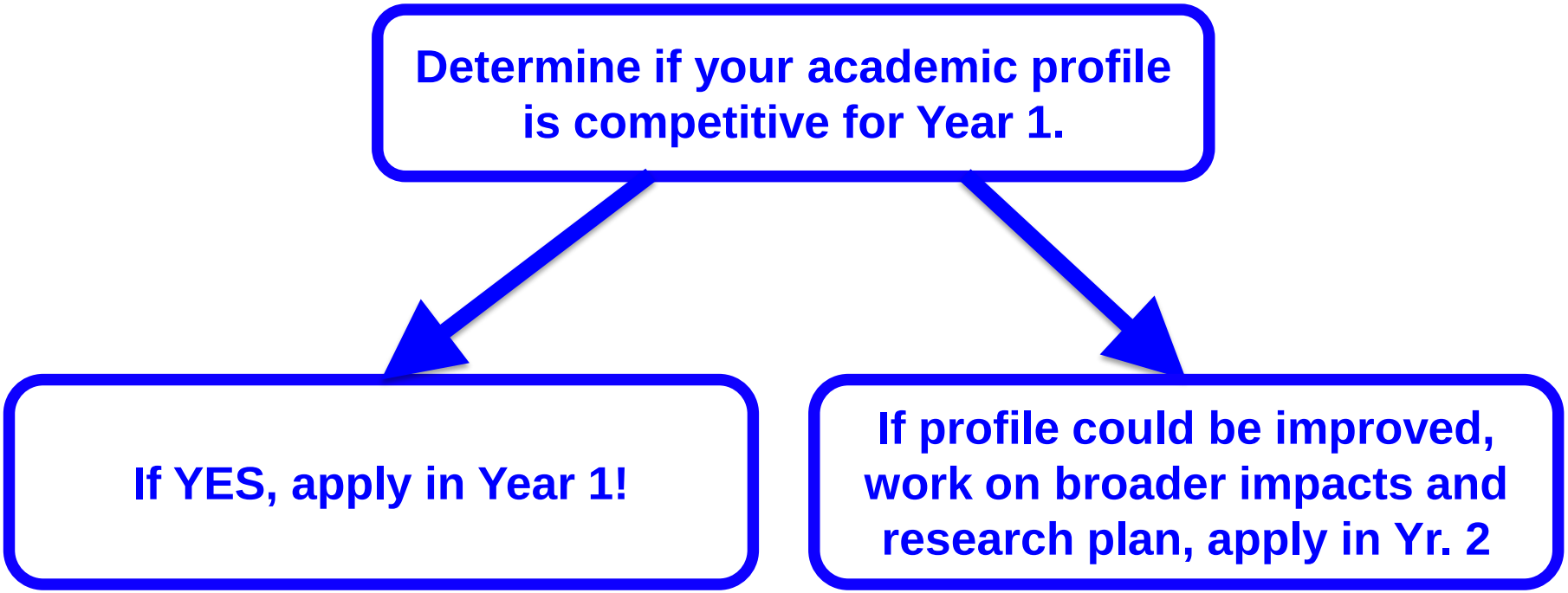
As a 1st year grad student, should I submit now? Or wait, and submit next year?

1st & 2nd year applicants are compared separately and within cohorts.

Do you have very strong **Intellectual Merit?**

Do you have a **strong and consistent record of Broader Impacts?**

Compared to your cohort, **will you have stronger IM & BI next year?**



What can you do to improve your profile?

- Develop a strong research proposal.
- Develop research skills
- Authorship on publication(s).
- Develop and engage in Broader Impacts
  - ✧ show consistent participation in Broader Impacts
- Develop strong relationship with research mentors including research faculty, training grant directors, research centers

NSF GRFP Cycle

- **Application:** Available online August
- **Deadlines:** Late October- early November **(varies by field)**
- **Awards:** Announced late March to early April
- Best Time to Start Preparing: **Now**

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NSF Resources

- NSF GRFP Website (nsf.gov/grfp)
  - Solicitation
  - FAQ and Guide links
- Fastlane.nsf.gov/grfp
  - Online application, user guides, official announcements
- Phone and email
  - 866-NSF-GRFP (673-4737)
- info@nsfgradfellows.org

Graduate Division Resources:

UCI Graduate Division Activities

WORKSHOP SCHEDULE

Internal, External, Private, & Foundation Fellowships
Wednesday, July 5 from 10:00 to 11:30 a.m.

NSF GRFP Information Session
Monday, July 10 from 9:00 to 10:30 a.m.

Writing for Fellowships - Personal Statements & Research Essays
Tuesday, July 11 from 9:00 to 10:30 a.m.

Introduction to the Ford Foundation Fellowships
Thursday, July 20 from 9:00 to 10:30 a.m.

Advice from the Experts: Faculty Reviewer Panel
Tuesday, July 25 from 9:00 to 10:30 a.m.

Application Experience Panel
Thursday, July 27 from 9:00 to 10:30 a.m.

Register: grc.uci.edu/services/grc - Click "Book Now"
Questions? E-mail grc@uci.edu or call 949-824-3849

NSF GRFP Fellowship: GRC Activities (AY 16/17 schedule)

- **9/28 NSF GRFP Info Session**
- **9/29 Writing for Fellowships: The Personal Statement**
- **9/30 Writing for Fellowships: The Research Essay**
- **10/1 Advice from the Experts: NSF GRFP Faculty Reviewer Panel**
- **10/6 The Fellowship Application Experience Panel**
- **10/8 The Ford Foundation Fellowship**
- **10/15 Broader Impacts Fair**
- **10/26 Application Due**

FELLOWSHIP APPLICATION ADVISING HOURS:

Make an appointment with Dr. Sandra Loughlin to discuss your fellowship application questions and receive feedback on your fellowship applications. Visit the GRC website to schedule an appointment at http://www.grad.uci.edu/services/grc

UCI Graduate Division/GRC Resources

- Dr. Sandra Loughlin holds fellowship advising hours every Thursday from 1:30-3:00pm at the GRC. She is available to discuss application questions and provide feedback on fellowship applications. Schedule an appointment by calling 949-824-3849.
- Dr. Celina Mojica will be available to discuss application questions and provide feedback on applications. Email for appointment.
- Writing Consultants at the GRC: students may make an appointment by calling 949-824-3849.
- Fellowship Application Samples: Students may view successful NSF GRFP applications at the GRC

School of Bio Sci Activities

NSF GRFP Proposal Writing Workshops

October 12 & 19, 2017

4 - 6 PM in 4206, 4212 & 4141 Natural Sciences II.

The writing workshops will focus on proposal feedback in a one-on-one or small group setting.

Complete Application Consists of:

NSF FastLane

- Personal, Relevant Background and Future Goals Statement (3 pages)
- Graduate Research Statement (2 pages)
- Transcripts, uploaded into FastLane
- Three letters of reference required (4 desirable)
- Additional information required for some candidates
  - See Solicitation for eligibility requirements (available on www.nsfgrp.org)

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NSF GRFP Review Criteria

- **Intellectual Merit:** this criterion encompasses the potential to advance scientific knowledge

- **Broader Impacts:** this criterion encompasses the potential to benefit society and contribute to the achievement of specific, desired societal outcomes

Include clearly labeled sections titled "Intellectual Merit" and "Broader Impacts" in both the personal and research statements!

Intellectual Merit Review Criteria:

Applicant's potential to advance knowledge based on the totality of the content of the application, including:

- strength of the academic record,
- proposed plan of research,
- research experience including publications, presentations, and references

Assessed metrics:

- **Research experience**
- **Academic performance**
- **References**
- **Publications**
- Communication skills
- International experience
- Leadership
- Creativity
- Appropriate institution & project
- Award & honors

Broader Impacts:

Broader Impacts: potential to benefit society and contribute to the achievement of specific, desired societal outcomes.

The potential for future broader impacts as indicated by:

- personal & professional activities
- educational & academic experiences
- previous contributions are important

Recommendations for superior scores:

- Be Specific!!!
- Be Creative
- Propose high quality impacts
- Draw on your previous activities and natural affinities

Broader Impacts Assessment

Prior accomplishments: previous contributions predict future behavior

Individual experiences: Working w/disadvantaged/underserved groups

Integration of research & education:

- Science outreach at K-12
- Blog
- Scientific outreach to the community

Potential to reach diverse audiences:

- Community, K-12, health awareness or resources, environmental issues, public health issues, business leaders,
- sharing research only with scientists guarantees “poor” ranking

How can you best impact society?

- Does your research/past experiences impact policies, laws, etc.

Leadership potential:

- Leading student groups or activities
- Leader in a professional/student/school organization

Personal, Relevant Background and Future Goals Statement (3 pages)

How will the doctorate prepare you for a career that will contribute to scientific understanding and broadly benefit society?

- Describe personal, educational, professional experiences that motivated you to pursue the doctorate
- Use specific examples from your research & professional activities.

Present a concise description of your previous research.

Highlight results and discuss how these activities prepared you to seek a graduate degree.

- Be specific about your role in these activities.
- Describe the contributions of your activities to advancing knowledge in STEM fields as well as the potential for broader societal impacts.

Use BI and IM sections headings

Graduate Research Plan (2 pages)

Present an original research topic you plan to pursue.

1st yr. students in CMB/INP should use a rotation topic

Describe the research plan:

- **Hypothesis or research question,** rationale, general approach, experimental design, unique resources, timeline, expected outcomes, pitfalls and caveats, alternative strategies.

Use IM and BI section headings.

Be clear, simple, and concise.

Avoid jargon, include relevant literature citations.

Address the potential of the research to advance scientific knowledge as well as the potential for broader impacts on society.

Recommendations for Letters of Support

Select faculty that:

- have previously served as a research advisor
- are current research advisor
- were involved with your recruitment to UCI

Also good choices:

- Directors of ORUs and Centers
- Research/NIH training grant directors
- distinguished senior faculty that you know

Letters MUST be received by **5 PM on November 3, 2016.**

NSF web site not yet updated for 2017 deadline

You must have at least **THREE** (consider asking for 4- 5 letters).

Recommendations for Letters of Support

Each letter should directly address your **Intellectual Merit** and your **Broader Impacts.**

Recommendation:

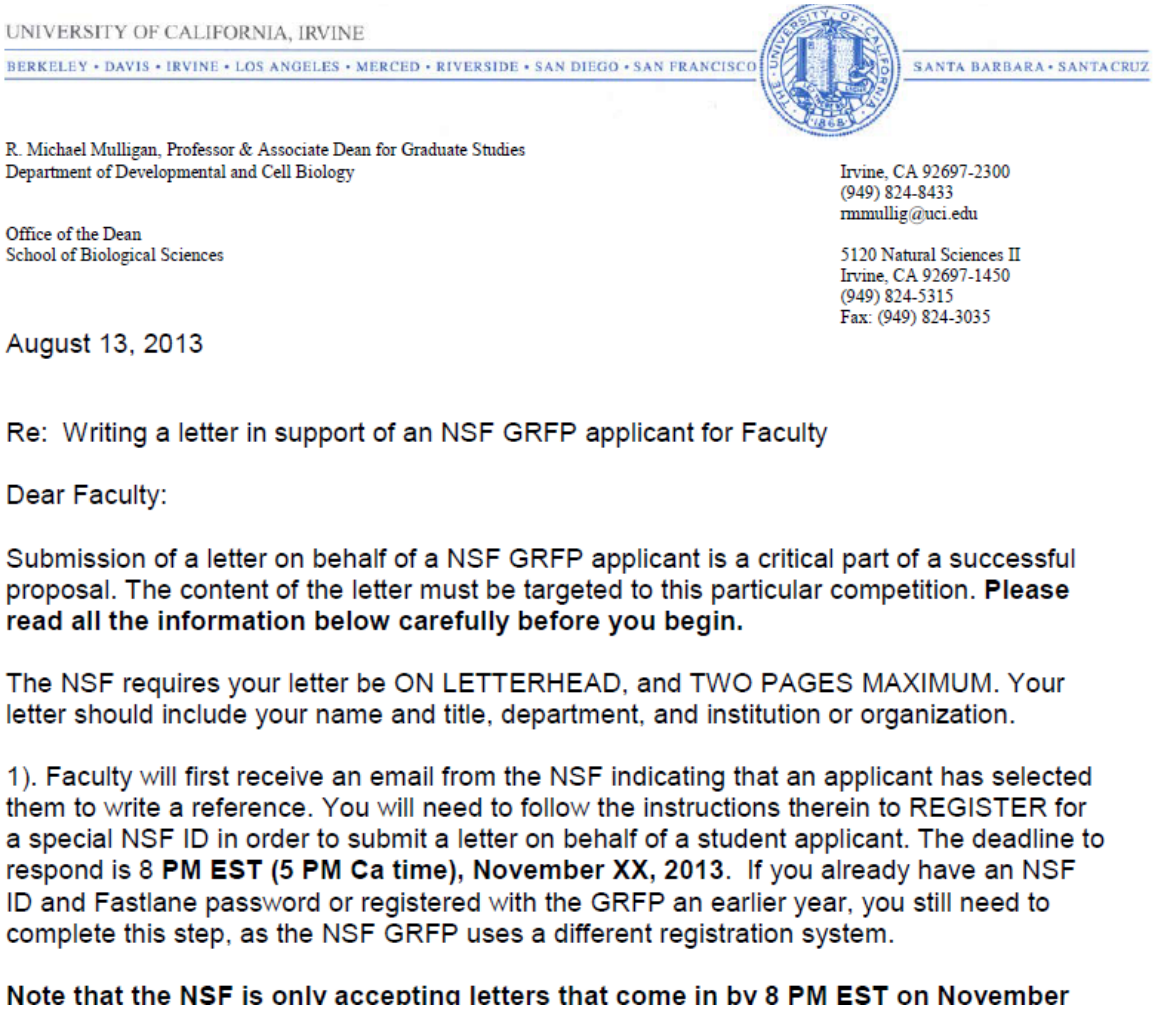
Write a **succinct** statement of your research proposal and your broader impacts in the request for a letter.

State that this information must be included in the letter.

Include instructions for letter writers in the request for a letter from program solicitation.

Recommendations for Letters of Support

Provide a copy of Associate Dean Mulligan's guide for letter writers:



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R. Michael Mulligan, Professor & Associate Dean for Graduate Studies
Department of Developmental and Cell Biology

Irvine, CA 92697-2300
(949) 824-8433
rmmullig@uci.edu

Office of the Dean
School of Biological Sciences

5120 Natural Sciences II
Irvine, CA 92697-1450
(949) 824-5315
Fax: (949) 824-3035

August 13, 2013

Re: Writing a letter in support of an NSF GRFP applicant for Faculty

Dear Faculty:

Submission of a letter on behalf of a NSF GRFP applicant is a critical part of a successful proposal. The content of the letter must be targeted to this particular competition. **Please read all the information below carefully before you begin.**

The NSF requires your letter be ON LETTERHEAD, and TWO PAGES MAXIMUM. Your letter should include your name and title, department, and institution or organization.

1). Faculty will first receive an email from the NSF indicating that an applicant has selected them to write a reference. You will need to follow the instructions therein to REGISTER for a special NSF ID in order to submit a letter on behalf of a student applicant. The deadline to respond is 8 **PM EST (5 PM Ca time), November XX, 2013**. If you already have an NSF ID and Fastlane password or registered with the GRFP an earlier year, you still need to complete this step, as the NSF GRFP uses a different registration system.

Note that the NSF is only accepting letters that come in by 8 PM EST on November

- **download from the CMB/INP web page**
- **obtained by email to Gary Roman or Renee Frigo**
- **directly from Associate Dean Mulligan**

Associate Dean Mulligan will send a memo to UCI faculty with this information in October

Applications Review

Panelists are academics & researchers in very general areas, not necessarily in your research area.

Panel review is virtual.

Applicants are separated into levels (UG/1st yr/ 2nd yr) and compared among their cohorts

Panelists rank Intellectual Merit and Broader Impacts.

Applicants receive anonymous copies of the reviews.

Panels make recommendations.

NSF makes awards decisions.

NSF GRFP & Biomedical Research

If you work in a biomedical research area:

- **emphasize basic scientific principles.**
- **avoid discussing "disease-related" aspects of your research** such as drug development, development of disease therapies, animal disease models.

"Research with disease-related goals, including work on the etiology, diagnosis or treatment of physical or mental disease, abnormality, or malfunction in human beings is normally not supported. Animal models of such conditions or the development or testing of drugs or other procedures for their treatment also are not eligible for support."

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Outreach Activities at UCI

- **COSMOS**: California State Summer School for Mathematics & Science at www.cosmos.uci.edu
- **CAMP**: California Alliance for Minority Participation in Science, Engineering and Mathematics at www.camp.uci.edu
- **UCI Rocket Science Tutors:** http://www.rocketsciencetutors.com
- **TechTrek Science and Math Camp for Girls**: partnership between AAUW and UC Irvine - http://www.aauw-techtrek.org/uci/
- **Graduate Division DECADE Program:** http://www.grad.uci.edu/about-us/diversity/decade/index.html
- **Graduate Division Mentorship Opportunities:**
  - ✧ Competitive Edge Program: http://www.grad.uci.edu/about-us/diversity/decade/competitive-edge.html
  - ✧ Graduate Division Summer Research Programs**:** http://www.grad.uci.edu/about-us/diversity/grad-prep-programs/non-uci-students/surf.html
- **The UCI Community Outreach Partnership Center (COPC):** Engage the community: http://sites.uci.edu/copc/

Outreach Activities in Bio Sci

BIOLOGICAL SCIENCES (See http://www.bio.uci.edu/students/graduates/outreach/)

- **Center for Learning in the Arts, Sciences, and Sustainability:** Builds collaborations with K-12 school districts and university campus partners to support research and direct service programs: http://www.clta.uci.edu/
- **Minority Science Program:** mentors minority undergraduate and graduate students to encourage and support them as they pursue doctoral degrees and biomedical careers.
- **Science Fair Initiative** has helped thousands of K-12 students from three Southern California school districts prepare science fair projects
- **K-12 Outreach:** work with K-12 teachers with underserved school districts

Center for the Neurobiology of Learning & Memory
University of California, Irvine

CNLM Outreach Programs

- Become a Docent for CNLM's school tour program
  - Educate students about the brain using hands-on exhibits
  - Gain teaching experience
- Brain Awareness Week (BAW)
  - Visit local schools to educate students about the brain and brain health
- Visit our website for more details www.cnlm.uci.edu

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University of California • Irvine

NSF

Outreach Activities in Phy Sci

LEAPS: Laboratory Experiments and Activities in the Physical Sciences: https://ps.uci.edu/node/8837

- **Physical Sciences Undergraduate Mentoring Program:** http://ps.uci.edu/content/undergraduate-mentoring-program
- **UCI Chemistry Outreach Program:** http://www.chem.uci.edu/~jsnowick/outreach/UCI_Outreach/Home.html
- **Math Counts:** Outreach to middle school students: http://www.physsci.uci.edu/outreach/mathcounts
- **Irvine Area Math Modeling (IAMM):** https://ps.uci.edu/content/irvine-area-math-modeling-iamm
- **UCI Math Circle:** Enrichment program for middle and high school students: http://www.math.uci.edu/~mathcircle/
- **CLEAN Mission - Climate, Literacy Empowerment And iNquiry**: http://www.ess.uci.edu/researchgrp/clean/home

Outreach Activities in the OC Area

- Aquarium of the Pacific
- Newport Bay Conservancy
- Back Bay Science Center
- OC Conservation Corps
- Boys & Girls Club Santa Ana
- OC Science and Engineering Fair
- Discovery Science Center
- OC Science Education Association
- Girls Inc.
- San Diego Zoo
- LA Natural History Museum
- Santa Ana Zoo
- Latino Health Access

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Intellectual Merit Criterion – First Submission

Review #1: Overall Assessment of Intellectual Merit **Good**

Explanation to Applicant: Applicant has a record of scientific productivity and letters of support are strong. Research plan would be strengthened if written in a hypothesis-driven manner rather than a descriptive one. Previous research experience could also be written in a more explicit and direct manner.

Review #2: Overall Assessment of Intellectual Merit **Good**

Explanation to Applicant: Applicant is very bright and driven. Applicant has a very strong undergraduate academic track record in chemistry and programming. Applicant has strong prior research that has led to co-authorship on a recent publication and several poster presentations. Research plan proposes an interesting, original and ambitious project. There is no specific mention of what hypotheses are to be tested and there is no mention of the challenges/problems that might be expected.

Intellectual Merit Criterion – Resubmission

Review #1: Overall Assessment of Intellectual Merit **Excellent**

Explanation to Applicant This application has many strengths. They include the academic success of the applicant; the previous research experience, pilot data, and productivity of the applicant; the quality and relevance of the hypotheses- driven research proposal; the excellence of the laboratory environment in which the applicant is doing the research; and the strong reference letters provided.

Review #2: Overall Assessment of Intellectual Merit **Good**

Explanation to Applicant The applicant brings a useful background in biophysical chemistry to a long-standing problem in neuroscience. Already having a strong set of quantitative skills is a great advantage in modern neuroscience.

Broader Impacts Criterion – First Submission

Reviewer #1: Assessment of Broader Impacts **Fair**

Explanation to Applicant Applicant presents a limited history of outreach by the standards of this competition. Application might be strengthened by explicitly describing the degree to which he was involved in chemistry demos as President of the chemical society. Such leadership roles are needed to make the application competitive. In addition, future plans in this area should be explicit, planning to participate in something already organized is not sufficient at this level.

Reviewer #2: Assessment of Broader Impacts **Fair**

Explanation to Applicant Applicant has background experiences that give great promise for broader impacts. Applicant's participation in the SOLUR program and mentoring activities has made the applicant aware of the continued need of students from disadvantaged populations. However, applicant does not show evidence of significant leadership in contributions to encouraging diversity or integrating research and education.

Broader Impacts Criterion – Resubmission

Reviewer #1: Assessment of Broader Impacts **Very Good**

Explanation to Applicant The applicant has a history of mentoring and outreach, which is to be commended. In particular, their participation at Reddit Science is an excellent way to provide science information, and excitement, to the general public.

Reviewer #2: Assessment of Broader Impacts **Very Good**

Explanation to Applicant Applicant has a very strong history of enhancing scientific understanding and integrating research and education. Applicant has shown leadership in these areas and has additional plans to expand online information and discussion of relevant scientific topics.

Panel Comments

Assessment of Intellectual Merit **Good**

Explanation to Applicant

The applicant proposes to develop a FRET assay in HeLa cells and later in mouse cortical neurons as well as use biochemical methods to identify SIMs. The application does not seem to have a hypothesis driven question and it is not clear how the two aims will contribute to our current understanding in the field.

Assessment of Broader Impacts **Very Good**

Explanation to Applicant

The applicant has a well established history of contributing to education and outreach to the general com- munity. Current outreach efforts are somewhat less defined. It is not clear how many activities were current or were planned for the future.

Panel Comments

Assessment of Intellectual Merit **Excellent**

Explanation to Applicant

The applicant presents diverse research experience of both a basic and clinical nature. Results from a recent pilot study were used to support a NIH R01 submission from the laboratory. However, the record for disseminating work is perhaps a bit sparse compared to the better applicants at this level. The first authorship of a manuscript in preparation is noted, as is authorship of a poster presentation.

Overall Assessment of Broader Impacts **Excellent**

Explanation to Applicant

The applicant shows a consistent and sustained record of volunteerism and outreach, both in and out of research. Moreover, the applicant has taken founding and leadership roles in many of this activities, and continues to drive these activities, at the national level in some cases. The level of sustained commitment is highly commendable and is consistent with individuals who have, and will continue to impact society.