# Graduate Studies at UCI

**R. Michael Mulligan, Prof. &**

**Associate Dean for Graduate Studies**

# The NSF GRFP Fellowship and Graduate Fellowship Opportunities

**Dr. Harinder Singh:** Academic and fellowship support programs offered through GPS-STEM

**Associate Dean Mulligan:**

Professional Support as a Continuum: opportunities from pre-doc to professional researcher

Preparation of a competitive NSF GRFP application

**Panel Discussion:**
- Kevin Cabrera      DCB (genomics)
- Jessica Noche Lingad      NBB (neurosci/cognition/imaging)
- Karissa Jade Munoz      DCB (cell biology/pathogenesis)
- Tiffany Nada Batarseh      EEB (genomics)
- Kristin Gabriel      MBB (molecular/structural biology)
- Linzi Hosohama      MMG (cancer biology)

**Panel Q&A**

# Graduate Professional Success
# in Science, Technology, Engineering & Math
# (GPS-STEM)

## Harinder Singh, Ph.D.
### *Program Director*

# Mission

We aim to better prepare our scientists for a variety of careers within the biomedical research workforce, and empower them to become not only skilled researchers, but also polished professionals.



For Academic

And Professional

# Program Structure

## Approach to Career Readiness: 4 Elements

**Science**

my **IDP**
Science Careers

INDIVIDUAL
DEVELOPMENT
PLAN

**Skills Development**

Overview
Overview Summary
Personal Information

Assessment
Skills Assessment
Interests Assessment
Values Assessment

Career Exploration
Consider Career Fit
Read About Careers
Attend Events
Talk to People
Choose a Career Path

Setting Goals
Career Advancement
Goals
Skill Goals
Project Goals

Development Plan
Mentoring Team
myIDP Summary

Quick Tips | My Skills
Now, use the tool below to set spe
Add a new SMART Goal

Select a skill to add a go

SMART Goal
Is this a recurring activi
Start Date
Target Completion Da
How will you be acco

Add SMART Goal

Visit the website and
start planning today!
myIDP.sciencecareers.org

**EXPLORE**

**TRAIN**

**EXPERIENCE**

**TRANSITION**

# UCI-GPS

EXPLORE    TRAIN    EXPERIENCE    TRANSITION

STEM

## TRAIN

**GPS-STEM Academic Advancement Activities**

# FELLOWSHIP SUCCESS FOR GRADUATE STUDENTS & POSTDOCS

**nature** **MASTERCLASSES** × THE UNIVERSITY OF CALIFORNIA · IRVINE · LET THERE BE LIGHT

# GPS-STEM Academic Advancement Activities

# FELLOWSHIP SUCCESS FOR GRADUATE STUDENTS & POSTDOCS

## 10 Week Course

- F-SERIES (F31, F32)

- PEER-PEER WORKING GROUPS

- PEER-PEER WORK FACILITATED BY TRAINEES & FACULTY WITH EXPERIENCE WRITING & RECEIVING GRANTS

- LESSONS LEARNED PANEL DISCUSSION

- LISTENING TO PODCASTS (NIH & NATURE)

**nature** **MASTERCLASSES** × THE UNIVERSITY OF CALIFORNIA · IRVINE ·

WHAT MAKES A GREAT RESEARCHER?

- GREAT KNOWLEDGE
- GOOD IDEAS EXPERIMENTAL DESIGN
- GOOD WRITING
- GREAT COMMUNICATION

NATURE MASTERCLASSES

PUBLISHING

**FREE**
*For*
*UCI Trainees*

Scientific Writing and Publishing

Effective Collaboration in Research

Focus on Peer Review

# Professional Support on a Continuum: Pre-doc to Professional Researcher

**GSP STEM**

**Pre-doctoral Fellowships**

**Training Grant Opportunities**

**Academic Publication**

**Post-doctoral Fellowships**

**Faculty Transition Grants and Fellowships**

# Pre-doc Fellowship Opportunities

NSF GRFP

NIH NRSA (F-31)

Ford Foundation

NOAA

EPA

HHMI Gilliam Fellowship

Resources at other campuses:

https://grad.ucla.edu/funding/

https://grad.ucdavis.edu/financial-support/external-fellowships

# UC President's Postdoctoral Fellowship

**Postdoctoral fellowships for outstanding scholars**
- research, teaching, service contribute to diversity & equal opportunity
- increasing equitable access for underrepresented groups

**Awards**
- research at any UC campus
- salary, benefits, $5K for research-related expenses
- 1 yr. appt., renewable
- support for initial faculty appointment at a UC campus

**Eligibility**
- must receive a Ph.D. prior to fellowship start
- legally authorized to work in the United States, includes DACA individuals

**Application:** typically in November

**Resources:**
- watch for campus workshops
- several alumni in the SoBS

# Research Career Development Awards:
## NIH K99/R00 "Pathway to Independence Award"

**Program Objectives:**

- Prepare a strong cohort of NIH-supported, independent investigators
- Facilitate transition from post-doc to tenured faculty positions
- Provides independent NIH research support for transition to competitive research careers
- U.S. citizen/non-citizen, doctoral degree, and no more than 4 yrs post-doctoral research experience
- U.S. domestic institutions

# Preparation of a Competitive NSF GRFP Application

**Overview**

Resources: Campus & School

Review Criteria, Statements, & References

GRFP and Biomedical Research

Outreach Opportunities

Applicant Reviews

# GRFP Objectives & Elements

**New Emphasis for 2020: Artificial Intelligence, Quantum Information Science, and Computationally Intensive Research**

**Objectives:**
- Increase STEM early-career grad fellowships
- Develop a diverse and globally engaged workforce
- Support for promising scientists with a societal impact
- **Funds scholars, not grants or research projects**

**Award Benefits:**
- Five Year Award – $138K
- Three years of financial support
- $34K Annual Stipend
- $12K Educational Allowance
- GROW: International research opportunity
- GRIP: Professional career development with federal internships
- XSEDE: access to cyber infrastructure resources

## Deadline for submission in Life Sciences is Monday, Oct. 19, 2020!

# GRFP Eligibility

- U.S. citizens, permanent residents

- Early-career students (UG, 1$^{st}$/2$^{nd}$ yr grad)

- no MS degree (unless 2+ yr gap)

- Pursuing research-based MS or PhD in NSF field

- Enrolled in accredited U.S. institution by fall 2021

- Applicants self-certify GRFP eligibility criteria

- **Graduate students may submit only once, 1$^{st}$ or 2$^{nd}$ yr.**

- Student that submitted as UG may submit as a grad

# Strategy: Submit in yr. 1? or wait for yr. 2?

Applicants are considered separately within peer group:

4 categories: (UG/1$^{st}$ yr grad/2$^{nd}$ yr grad/2+ yr gap)

- Applicants are ranked within their peer group

- Expectation and competitiveness increase through these peer groups

**If you have strong Broader Impacts & Intellectual Merit, you have an advantage as UG or 1$^{st}$ yr grad**
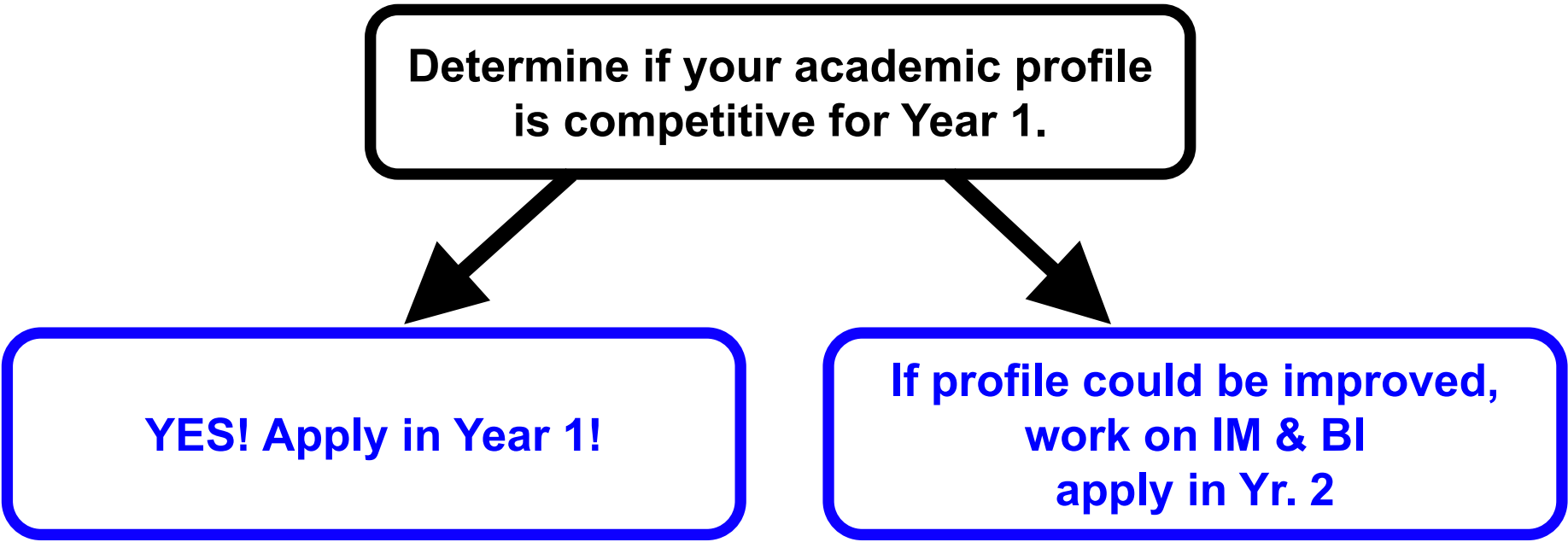
# Submit now? or wait a year?

**Compared to your cohort, do you have:**

**Strong Intellectual Merit (IM)?**

publications, awards, academic background, fellowships, high GPA

**A strong & consistent record of Broader Impacts (BI)?**

outreach to K-12, diversity groups, society or community activities

**Determine if your academic profile is competitive for Year 1.**

**YES! Apply in Year 1!**

**If profile could be improved, work on IM & BI apply in Yr. 2**

# If you wait until year 2, what can you do to improve your application?

- Develop a **strong** research proposal

- Develop research and writing 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

# NSF GRFP Cycle & Resources

## NSF GRFP Website (nsf.gov/grfp)/Fastlane.nsf.gov/grfp

**Application:** Available online August (open)
**Deadlines:** Late Oct. (varies by field)
**Awards:** Announced late March
**Best Time to Start Preparing:** in the summer

### Applicants

- Applicant Eligibility
- GRFP Application Tutorial
- FAQs
- Important Dates
- GRF Program Solicitation
- Merit Review Criteria
- Tips
- GRFP Application
- Application Components

+ Note your application deadline

+ Consider your major field carefully

+ Do not wait until the last minute to prepare and submit your application materials

+ Use the preview feature

+ Make sure you follow the formatting instructions

+ Save a copy of your application

+ Do not underestimate the importance of reference letters

+ Be comprehensive in your selection of reference writers

+ Consider requesting up to 5 references

+ Keep in mind that the GRFP application is not an NSF grant proposal

### Reference Writers

- Requirements
- Reference Writer Tutorial
- FAQs
- Tips

# Graduate Division Activities

**Fellowship advising with Dr. Kayleigh Anderson-Natale available. Click here or email kayleiga@uci.edu**

**Virtual NSF GRFP Q&A Drop-In Hours**

Drop-by to ask any questions that you have about NSF GRFP!

- October 8, 2020, 2:00-4:00 PM & October 13, 2020, 9:00-11:00 AM

**Writing for Fellowships**

Learn strategies for writing competitive fellowship materials!

- October 12, 2020, 1:00-2:30 PM

**Ford Fellowship Information Session**

Learn about the basics of applying for the Ford Predoctoral Fellowship.

- October 28, 2020, 10:00-11:00 Am

**NSF GRFP Programs:**

NSF Information Session & NSF Writing and Review Session recordings to be distributed to departments and students!

# School of Biological Sciences Activities

- Current NSF GRFP recipients willing to assist applicants in proposal preparation (TBA in September)

- Gary Roman has recent applications that were funded

# 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)

# 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

Clearly indicate **"Intellectual Merit"** and **"Broader Impacts"** with labeled section headings or bolded text.

Include in **bolded sections** in both the **Personal** and **Research Statements!**

# Intellectual Merit Review Criteria:

Applicant's potential to advance knowledge based on holistic review of the application, including:

- strength of the academic record
- proposed plan of research (hypothesis, experimental approach, impact)
- research experience (publications, presentations, 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 outcomes**.

**The potential for future broader impacts as indicated by:**

- personal & professional activities
- educational & academic experiences
- previous and continuing contributions are critical

**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, Social Network

- 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 a "poor" ranking**

**How can you best impact society?**

- Does your research/past experiences impact policies, laws, environment

**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 or bolded sentences within the text**

# 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 from References

**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

You must have **at least 3 letters** (consider asking for 4 or 5 letters).

**Reference letters are due October 30, 2020 at 4:00 p.m. Eastern Time (ET).**

# Recommendations for Letters of Support

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

## Recommendations:

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

- State that this information should be included in the letter.

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

# Application Review

- Panelists are academics/researchers in very general areas, not necessarily in your research area

- Applicants are separated into levels (UG/1$^{st}$ yr/ 2$^{nd}$ yr/2+ yr gap) and compared among peer groups

- Applications are individually reviewed by 3 panel members.

- Each panelist ranks Intellectual Merit and Broader Impacts and provides a succinct statement for each category

- A proposal may be referred for discussion by the reviewers

- Applicants receive anonymous copies of the reviews

- Panelists make recommendations, NSF makes award 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."

# 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/
- **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

# 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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# 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 Assoc.
- Girls Inc.
- San Diego Zoo
- LA Natural History Museum
- Santa Ana Zoo
- Latino Health Access

# Preparation of a Competitive Proposal….

GRFP Overview

Resources

Review Criteria, Statements, & References

GRFP and Biomedical Research

Outreach Opportunities

**Applicant Reviews**

# Intellectual Merit Criterion – <u>First Submission</u>

**Review #1: Overall Assessment of Intellectual Merit**   <span style="color:red">**Good**</span>

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

**Review #2: Overall Assessment of Intellectual Merit**   <span style="color:red">**Good**</span>

**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. <span style="color:red">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.</span>

# Intellectual Merit Criterion – <u>Resubmission</u>

**Review #1: Overall Assessment of Intellectual Merit** <span style="color:red">Excellent</span>

**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; <span style="color:red">the quality and relevance of the hypotheses- driven research proposal;</span> 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** <span style="color:red">Good</span>

**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 – <u>First Submission</u>

**Reviewer #1: Assessment of Broader Impacts** <span style="color:red">**Fair**</span>

**Explanation to Applicant** <span style="color:red">Applicant presents a limited history of outreach by the standards of this competition.</span> Application might be strengthened by explicitly describing the degree to which he was involved in chemistry demos as President of the chemical society. Such <span style="color:red">leadership roles are needed to make the application competitive.</span> 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** <span style="color:red">**Fair**</span>

**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. <span style="color:red">However, applicant does not show evidence of significant leadership in contributions to encouraging diversity or integrating research and education.</span>

# Broader Impacts Criterion – <u>Resubmission</u>

**Reviewer #1: Assessment of Broader Impacts** <span style="color:red">**Very Good**</span>

**Explanation to Applicant** The applicant has a history of mentoring and outreach, which is to be commended. <span style="color:red">In particular, their participation at Reddit Science is an excellent way to provide science information, and excitement, to the general public.</span>

**Reviewer #2: Assessment of Broader Impacts** <span style="color:red">**Very Good**</span>

**Explanation to Applicant** Applicant has a very strong history of enhancing scientific understanding and integrating research and education. <span style="color:red">Applicant has shown leadership in these areas</span> and has additional plans to expand online information and discussion of relevant scientific topics.