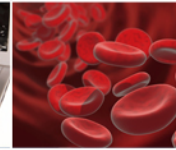




WHERE DISCOVERIES BEGIN



# **CAREER Proposals: Integration of Research, Education, & Outreach**

**Division of Chemical, Bioengineering,  
Environmental, and Transport Systems (CBET)**

**Directorate for Engineering**

Presented by: Raj Mutharasan  
Program Director, Nano-Biosensing



# CAREER Proposal Setup: KEY Elements (study NSF 17-537)

## FRONT END INCLUDES:

**Cover Sheet**  
"CAREER: " in Title

**Project Summary (1 page)**  
Intellectual Merit  
Broader Impacts

**Project Description (15 pages)**  
Proposed Research Project & Plan  
Proposed Education Activities,  
Integration with Research,  
and Assessment

## BACK END INCLUDES:

**Biographical Sketch (2 pages)**  
Research and Education  
Accomplishments

**Departmental Letter (2 pages)**  
Activities supported by institution  
Career development of PI

**Budget**  
Five years, \$500,000 total



# CAREER proposals must have an integrated research & education plan

- ❑ Propose creative research and education plans and how they will be integrated & assessed
- ❑ Envision how the research program will impact educational goals, and how education activities will feed back to the research
- ❑ Balance both research and education, but avoid “over proposing” activities (quality over quantity)



WHERE DISCOVERIES BEGIN

# CAREER

## PROPOSAL

Education  
Activities



Educational  
Goals



Research  
Program

### Instruction (examples)

- Innovative courses & curricula
- Integration of research into coursework

### Training & Mentoring (ex.)

- Undergrad & grad research
- Teacher enhancement
- International opportunities for students

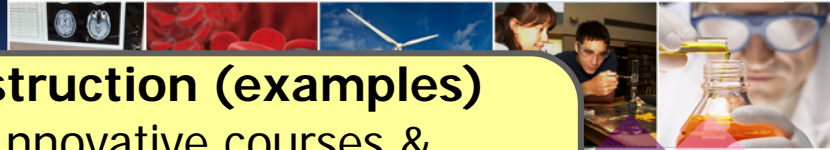
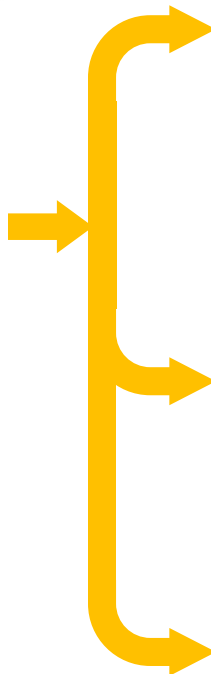
### Outreach (examples)

- Engagement K-12 students
- Scientific literacy of public

Evaluation & Assessment

Broadening Participation

Under-represented groups  
in STEM Fields





# Intellectual Merit and Broader Impacts Review Criteria (revised 2013)

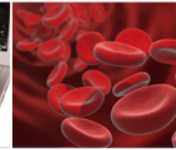
- To what extent do the proposed activities suggest and explore creative, original, or potentially transformative concepts?
- Well-reasoned, well-organized plan based on a sound rationale? Does the plan incorporate a mechanism to assess success?
- Qualifications of PI to conduct the proposed activities?
- Adequate resources available to PI/PI team at home/ collaborator institution?

## Intellectual Merit

Advance knowledge and understanding within its own field or across different fields

## Broader Impacts

Benefit society or *advance desired societal outcomes*



# Balance Intellectual Merit & Broader Impacts

## Intellectual Merit (Research & Education)

- Advancement and contribution of knowledge in its own field or across different disciplines?
- Creative and original concepts?
- Well-conceived and organized proposal?
- Qualifications of the PI?
- Adequate resources available to the PI?

## Broader Impacts (Broadening Participation)

- Advancement of discovery and understanding while promoting teaching, training, & learning?
- Broad dissemination to enhance scientific and technological understanding, e.g. Outreach?
- Participation of under-represented groups in STEM?
- Educational Impact, including undergraduate & K-12?



# Balance Research & Education

## Research

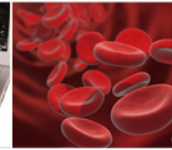
(10-12 pages)

- Vision for five year research & education program for a lifetime of contributions?
- Creative & original concepts?
- Advancement and contribution of knowledge in its own field or across different disciplines?
- Well-conceived and organized research plan?

## Education

(3-5 pages)

- Are the proposed activities inspired by the research program?
- Creative & original concepts?
- Are education & outreach activities well conceived & integrated with the research?
- Are these activities assessed and evaluated?
- Do these activities engage participation of under-represented groups in STEM?



# Getting Feedback & Insights: Integration of Research & Education

## Submit a Proposal Concept

Study desired Program Description on NSF Website ([www.nsf.gov](http://www.nsf.gov))

One-page Summary (Intellectual Merit & Broader Impacts) to PD by email

Program Director (PD) provides Feedback by email

## Visit NSF Arlington, VA



Contact cognizant Program Director with dates to visit

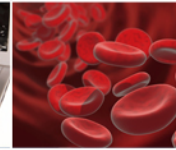
## Phone Call to Program Director

Request a phone conversation by email

Submit a Proposal Concept

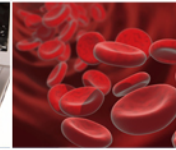
Provide a list of questions by email at least 24 hours before the call





# **Question: Whom should I contact to discuss my ideas for a CAREER proposal to be sure CBET supports the topic area?**

- France Cordova, Director of NSF
- ENG CAREER Coordinators
- CBET Program Director
- Barry Johnson, Acting Assistant Director of ENG

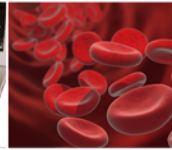


# Answer

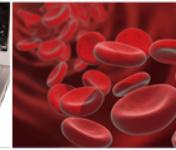
- France Cordova, Director of NSF
- **ENG CAREER Coordinators**
- **CBET Program Director**
- Barry Johnson, Acting Assistant Director of ENG



WHERE DISCOVERIES BEGIN



**Question: I am non-tenured but hold the title of associate professor. May I apply to the CAREER Program?**



# Answer

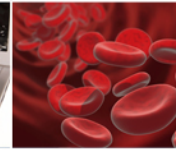
**No!** An associate professor (with or without tenure) is not eligible to apply for a CAREER award.

**Only assistant professors without tenure are eligible.**

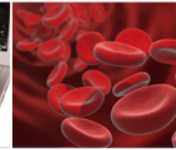
The CAREER Program is intended for faculty members who are at or near the beginning of their careers.



WHERE DISCOVERIES BEGIN

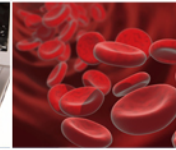


**Question: I was promoted to Associate Professor (tenured or tenure track) after I submitted my CAREER proposal. Am I still eligible?**



# Answer

- **Maybe!** As long as you remain in a tenure-track Assistant Professor (or equivalent) position until the **October 1st** following your proposal submission deadline **you will be eligible** for CAREER.
- If your appointment changes to Associate Professor (either tenure-track or tenured) on or before the October 1st following your proposal submission deadline **you are not eligible** for CAREER.

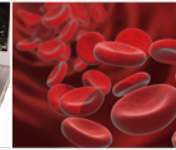


# Answer

- **\*Note\*** CAREER appointment eligibility is determined by the date your appointment becomes effective at your university, not by the date on the letter notifying you of your promotion.
- You should not submit a proposal if you anticipate your title will change to Associate Professor on or before the October 1st following the proposal submission deadline.



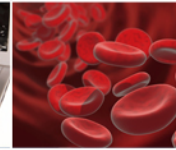
WHERE DISCOVERIES BEGIN



# Which of the following will result in a proposal being returned without review?

- A. A co-principal investigator is listed
- B. The PI did not submit to the current CAREER solicitation
- C. Departmental letter is missing





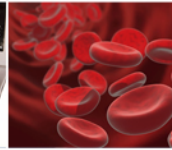
# Answer

**All of the Above**  
**A, B, and C**

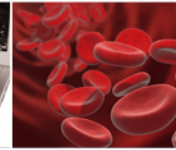
- A. A co-principal investigator is listed
- B. The PI did not submit to the current CAREER solicitation
- C. Departmental Letter is missing



WHERE DISCOVERIES BEGIN



**Question: How does having another NSF grant affect the CAREER award decision?**

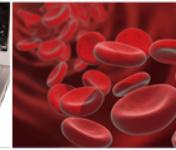


# Answer

- Having an NSF grant when applying for a CAREER award **does not** affect the possibility of winning a CAREER award.
- However, the content of the two proposals must be significantly different from one another, so as not to give the impression that the same proposal is being resubmitted for a second grant.



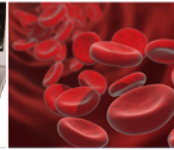
WHERE DISCOVERIES BEGIN



**Question: How are CAREER proposals reviewed? Are they mainly panel reviewed, ad-hoc/mail reviewed or a combination of these methods?**



WHERE DISCOVERIES BEGIN

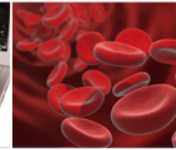


# Answer

- CAREER awards are mainly reviewed by panel review.



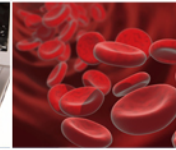
WHERE DISCOVERIES BEGIN



**Question: I have two possible projects. May I submit two CAREER proposals to two different Programs, Divisions or Directorates?**



WHERE DISCOVERIES BEGIN

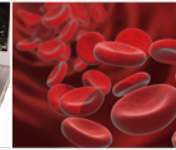


# Answer

**No!** You may submit only one CAREER proposal per competition.

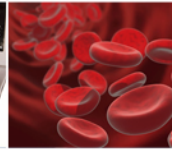


WHERE DISCOVERIES BEGIN



**Question: May I submit a CAREER proposal and a regular research proposal on a similar topic to NSF at the same time?**





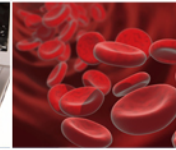
# Answer

**No!** The same work cannot be funded twice, so a proposal should be submitted only once to NSF (either as a CAREER or as a regular research proposal to any NSF program or programs).

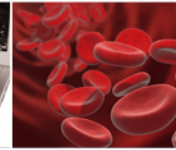
The submission of duplicate or substantially similar proposals concurrently for review by more than one program without prior NSF approval will result in the return of the redundant proposal.



WHERE DISCOVERIES BEGIN



**Question: Do I need to involve  
an outside evaluator for the  
education component?**



# Answer

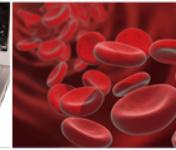
**No!** You do not need to utilize an outside evaluator.

However, you should have some sort of evaluation plan to provide feedback that could lead to future improvements.

Seek someone within your organization to help you if you have never done an evaluation. Most academic institutions have either an education department where you might find collaborators, or an evaluation system in place for coursework that could be modified to suit your needs.



WHERE DISCOVERIES BEGIN



# **CAREER Awards: Feedback from a Former CAREER Awardee**

Alexander Leonessa, Associate Professor  
Mechanical Engineering, Virginia Tech  
Former Program Director, CBET