Conversations
Competitive Grants

Deb Hamernik
Associate Dean, Agricultural Research
Associate Director, NE Ag Experiment Station

Rick Koelsch
Associate Dean, UNL Extension

Tisha Gilreath Mullen
Director, Office of Proposal Development (OPD)
Office of Research & Economic Development (ORED)

February 27, 2015
January

Internal Funding Opportunities

1) Calendar of Internal Funding Opportunities

http://ard.unl.edu/internal-funding-opportunities-calendar

2) Modify IANR Travel Grant Program

- NUgrant module will be open all year
- Submit applications any time for travel any time during the fiscal year—submit early!
- **Review** applications quarterly (January 15, April 15, July 15, October 15)
- Priority to early career faculty
Concept Papers--Agenda

• Preparation of Concept Papers
  ✓ Format
  ✓ Heilmeier’s Questions

• Visit to Funding Agency

• Tear Sheet or Quad Sheet

• Elevator Pitch

• Additional Resources in ORED
  ✓ VCRED Faculty Travel Awards
  ✓ Expert Review of External Applications
  ✓ Funding Announcement Newsletter
Description of your *proposed* research project:

- Helps to focus and describe a research plan
- Get feedback before develop full application

- Network with potential funding agencies
- Find collaborators
- Share ideas with administrators

- Generate enthusiasm for your project
Concept Papers—Format

1) Overall goal and objectives
2) Problem to be addressed/Gaps in literature
3) Approach
4) Potential impacts/outcomes
5) Anticipated budget (relative to RFA)
6) Contact information
Concept Papers

Overall goal and objectives: What do you want to accomplish? What must be accomplished to achieve success? Use plain language—no jargon.

Problem to be addressed: What pressing scholarly issue or societal challenge are you trying to address? What is currently being done and what are the current limitations?
Gaps in the current research: What is missing from the current literature that the proposed research will attempt to address? What is innovative and novel?

Approach: What is new in your approach? Why will you approach be successful? How will you fix the problem? What is innovative about your idea? Avoid details.
Potential outcomes/impacts/deliverables: Describe changes in knowledge, actions, or conditions from the project that will be of interest to the funding agency. Describe the deliverables from the project.

NSF wants to see “broader impacts”
Budget: High-level summary (personnel, equipment, supplies). Make sure budget aligns with program limits. Include estimate of time (years).

Contact information: Name, phone #, email for you and primary collaborators, if appropriate.

UNL Brand:
http://ucomm.unl.edu/toolbox.shtml
Heilmeier’s Questions

• What are you trying to do? Articulate objectives without jargon.
• How is it done today? What are the limits of current practice?
• What is new in your approach? Why do you think it will be successful?
• Who cares?
• If you are successful, what difference will it make?
• What are the risks and the payoffs?
• How much will it cost? How long will it take?
• What are the midterm and final exams to check for success?
Concept Papers--Tips

• Use graphics to help communicate
  – Preliminary data (photos, graphs, flow charts,...)

• Two pages (max)

• Use font size/style, margins, and terminology (objectives or specific aims) consistent with funding agency recommendations
  – NIH: specific aims
  – NSF & USDA NIFA: objectives

• Include your phone number & email address

• Include the UNL brand
**Concept Papers--Tips**

- The title should relay the essence of your idea—not just the subject of your research.
- The reader should understand what you are proposing and its benefits.
- Examples:
  - *Boron Carbide Neutron Detectors*
  - *Efficient Neutron Detectors Based on Boron Carbide*
  - *An Efficient, Compact, Cost-Effective Neutron Sensor*
• Write “SMART” objectives
  – Specific
  – Measurable
  – Achievable
  – Relevant
  – Time-bound
Ask for Feedback

Ask colleagues to review/edit your concept paper and provide feedback on the science

Ask Tisha Mullen (Director, Office of Proposal Development in ORED) to review/edit for formatting, grammar, etc.

TGilreathMullen2@UNL.edu
Visit to Funding Agency

Identify appropriate Programs and Program Officers
• Ask colleagues for recommendations
• Search NSF, NIH, USDA NIFA, etc. websites
• Find a relevant program/funding opportunity/RFA
• Identify appropriate program officers
Visit to Funding Agency

6-8 weeks prior to visit:

• Email the program officer to request a meeting (30-60 minutes)
• Include a copy of your concept paper
• Include a copy of your CV (in the agency format)
• Indicate that you will be in Washington, DC and UNL administrators encouraged you to visit
• What if program officer does not respond?

http://research.unl.edu/facultyresources/docs/FundingAgencyVisitGuide.pdf
Visit to Funding Agency

1 week prior to visit:

• Email the program officer to confirm the meeting
• Ask them to give your name to the security desk
• Prepare a tear sheet and elevator speech
Tear Sheet

• One page, stand-alone document
• Use to discuss project with program officers at the meeting
• Marketing piece
• Use short, bulleted text
• Use graphics (photos, graphs, flowcharts, etc.)
  – Must include legend to describe
• Include your name, phone number, email address
• Include the UNL brand
Three Sections:

• Problem Statement
  ▪ 1 -- 3 bullets of text

• Research Components
  ▪ 2 or 3 bullets of text

• Expected Outcomes
  ▪ 1 or 2 bullets of text
  ▪ Shortest section (<1/3 of text section)
Novel Nanostructure Biomolecular
Mueller-Matrix Microscopy
Primary Investigator: Mathias Schubert, schubert@engr.unl.edu

Problem Statement

- The focus of this research is on biomolecular recognition and catalysis
- Traditional optical microscopy schemes are fast, but they are unreliable for detection of biomolecular uptake on flat, chemically functionalized chip areas
- Research objective is to develop visible light optical microscopy readout methods to detect attachment of the target biomolecules to specially designed nanostructure surfaces

Research Components

- Nanostructure preparation group – Preparation of highly optically anisotropic nanostructure surfaces
- Surface chemistry group – Nanostructure surface functionalization for specific molecular mass uptake
- Polarization microscopy group – Image capture and differentiation technique development

Expected Outcomes

- Primary – A new polarization optical microscopy readout technique for fast and reliable biomolecular testing
- Long-term – Laboratory and clinic standards for immediate testing of biomolecular occurrences
**Novel Lignocellulases for Biofuel Generation**

Primary Investigator: James Van Etten

**Problem Statement**

- The focus of this research is on biofuels – specifically, ethanol from cellulosic feed stocks.
- Fuel ethanol from cellulosic feed stocks is a feasible and near-term solution for supplementing kernel corn ethanol production, thus reducing our petroleum dependence.
- The objective of this research is to isolate novel enzymes from viruses, bacteria, insects, and nematodes occupying niches that favor the evolution of unique cellulase and hemicellulase enzymes.

**Research Components**

- Algal Virus Group - Isolation and molecular biological characterization of algal virus cell wall degrading enzymes
- Microbiology Group - Lignocellulose degrading enzymes from alkaliphilic bacteria isolated from alkaline lakes located in western Nebraska
- Metazoan Group - Evaluation of metazoan-derived lignocellulotic degrading enzymes
- Enzyme Characterization Group

**Expected Outcomes**

- **Primary** - A library of novel cellulosic and hemicellulosic hydrolytic enzymes from a broad range of viral, microbial, and metazoan species for fuel ethanol production
- **Long-term** - A reduction in the production cost of cellulosic ethanol, which will lead to expanded biofuels research networks and enhanced technology development in alternative fuel sources
Problem Statement

- Despite our need for skilled workers, most are lost from our education system, including many low-skilled adults.
- Low-skilled adults first must take remedial basic skills courses, but half drop out before completion of remedial coursework.
- The longer students spend in remediation, the less likely they are to complete their courses and graduate.

Research Components

- Accelerated learning and contextualized learning help students make better progress and increase completion rates.
- Accelerated learning moves students through remedial courses quickly and builds momentum toward completing their college goals.
- Contextualized learning develops basic skills in the context of exploring occupations in the U.S. food, agriculture, and natural resources system that will be in high demand (FAERS, 2008).

Expected Outcomes

- Findings will show how courses that accelerate student progress through remedial courses and increase course completion rates are designed and evaluated.
- A new program will be developed in an agricultural area of need for each college using accelerated learning and contextualized learning.

Helping Students Succeed

<table>
<thead>
<tr>
<th>Courses that:</th>
<th>Result in:</th>
<th>Leading to:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accelerate learning</td>
<td>Faster progress</td>
<td>Entry to college programs</td>
</tr>
<tr>
<td>Contextualize learning</td>
<td>Higher rate of completion in</td>
<td>Advancement to college</td>
</tr>
<tr>
<td></td>
<td>remedial courses</td>
<td>and career goals</td>
</tr>
</tbody>
</table>

The U.S. Educational Pipeline

- 68 students graduate from high school four years later.
- 40 students immediately enter college.
- 27 students are still enrolled in their second year.
- 18 students graduate with either an associate’s degree within three years or a bachelor’s degree within six years.
- 82 of 100 ninth graders are lost from the educational pipeline.
- More than 60% of those lost are adults aged 23 and older.
Nano-scale Probing and Imaging of Active Transport in Live Cells Under Mechanical and/or Chemical Stress
Primary Investigator: Ravi F. Saraf, rsaraf@unlnotes.unl.edu

Problem Statement

- Evidence shows in the literature, based on biochemistry/cell biology studies on endpoint measurement of gene expression and protein identification, that mechanotransduction, or conversion of physical stimuli to a chemical response, is a pervasive cellular process that is critical in homeostasis and the cause of many diseases.

- A variety of techniques have emerged over the years to apply mechanical stress on a single live cell (or a few) or to study the real-time chemical response to a chemical stimulation. Current techniques to probe mechanotransduction in a cell are limited with none that allow measurement of chemical processes in real time at the single-cell level.

- Objective is to develop a method to probe biochemical response of an isolated cell or group of cells/tissue to external mechanical/chemical stimulus, in particular to measure the active transport process in real time at the single-cell level.

Research Components

- **Physical Science:** Develop the optical method using a nanoprobe on a micro-cantilever to probe at a single point (and subsequently image) the ion-plume from ion-channels (Fig. 1). Study and characterize the method as a function of chemical and mechanical stress for two model systems: yeast and mammalian endothelial cells.

- **Cell Biology:** Microorganism and mammalian cell systems will be developed to study at a single-cell level, the effect of chemical-mechanical stress on: 1) active pumping of a toxin and healing, 2) cellular aging, and 3) malignant transformation.

Expected Outcomes

- New, cutting edge technology for constructing tissue for artificial organs and cartilage for: improving cardiac contractility; optimizing agitation in processing microorganisms for protein expression in large reactors with stirring; healing process; and, perhaps, developing ways to create a new class of biophysical sensors

- Quantitative understanding of cell response in real time at single cell level
Quad Sheet

Program officers at the Department of Defense prefer a *Quad Sheet*

1) Concept/Relevance/Broader Impacts
2) Goals/Approach/Challenges & Mitigation
3) Graphic
4) Cost and Schedule
**Title of Project**

**Concept**
- A concise one- or two-sentence description of your idea

**Relevance**
- How does your idea solve a technical or societal problem and/or why is your idea better than current methods? What is innovative or unique? Describe impact in terms of increased performance, lowered cost, better cost-effectiveness, faster schedule, or lower mission or programmatic risk.

**Broader Impact**
- How might your idea be scaled or applied in other areas? Make sure the broader impacts are plausible

---

**Goals**
- What will you deliver, demonstrate, or achieve? Goal(s) should be well-defined, concrete, and measurable.

**Approach**
- Using a bulleted list, summarize the technical approach or tasks you will use to achieve the goal(s).

**Challenges and Mitigation**
- Summarize the key technical challenges you will face performing this work and how you intend to address these challenges.

---

**Cost and Schedule**

<table>
<thead>
<tr>
<th>Task</th>
<th>Time Period 1</th>
<th>Time Period 2</th>
<th>Time Period 3</th>
<th>Time Period 4</th>
<th>Time Period 5</th>
<th>Time Period 6</th>
<th>Total Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Descriptive Name</td>
<td>$10</td>
<td>$12</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$10</td>
<td>$60</td>
</tr>
<tr>
<td>2. Descriptive Name</td>
<td>$10</td>
<td>$10</td>
<td>$9</td>
<td>$7</td>
<td>$7</td>
<td>$7</td>
<td>$50</td>
</tr>
<tr>
<td>3. Descriptive Name</td>
<td>$3</td>
<td>$4</td>
<td>$5</td>
<td>$6</td>
<td>$6</td>
<td>$6</td>
<td>$30</td>
</tr>
<tr>
<td>4. Descriptive Name</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$6</td>
</tr>
<tr>
<td>5. Descriptive Name</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$1</td>
<td>$6</td>
</tr>
<tr>
<td><strong>Total Funding</strong></td>
<td>$13</td>
<td>$26</td>
<td>$16</td>
<td>$34</td>
<td>$1</td>
<td>$1</td>
<td>$91</td>
</tr>
</tbody>
</table>

**Management**

**PI:** PI Name, piemail@pi.edu
**OTHER CONTACT:** Other Name, otheremail@otheremail.edu

---

The University of Nebraska–Lincoln is an equal opportunity educator and employer.
Talking with Program Officers

- Other program officers may be invited to the meeting (bring extra handouts)
- Plan to give a 5-10 minute overview of your project
- Use your tear sheet as a resource—point to figures
- Encourage the program officer to ask questions about your project—listen, take notes!
- Pay attention to their body language
- Might go longer than 30 minutes, if they are interested in the project and you
Talking with Program Officers

- Ask questions
  - Does my project fit this program?
  - Does the panel have expertise to review this project?
  - Are there other programs at other agencies?
  - Which NIH funding mechanism (RO1, RO3, etc.)?
  - Is the budget/timeframe appropriate?
  - What is the success rate in this program?
  - How are applications from New Investigators reviewed?
  - How can I review for this program (volunteer)?
Elevator Speech

• 2-3 minute synopsis of your research project
• Put in perspective of societal challenges
• Answers to “so what”? Why should the public care? Why should taxpayers support this?
• Show enthusiasm/passion for the topic
• Practice—conversation, natural flow, almost without thinking
After Visit to Funding Agency

• Send an email message to thank program officers for their time and advice
• Remind them that you would like to volunteer to serve on a review panel
• If they asked for additional information, remember to send it to them (e.g., preprints, websites, etc.)
After Visit to Funding Agency

Prepare a ~1 page summary of your visit to share with your mentor, Department Head, Dean/Associate Dean for Research, Vice Chancellor for Research (whoever helped you prepare for trip)

- List the program officer(s) you met with
- Is your project a fit for their program(s)?
- Describe a timeline for submitting an application
- Describe any other new information you learned
- Did you volunteer to serve on a review panel?
- Thank them for supporting your trip
VCRED Faculty Travel Awards:
• Provide 1/3 match with college/department to pay for your trip to visit program officers at federal funding agencies

• Form to request VCRED travel award at:
  http://research.unl.edu/facultyresources/facultyTravel.php
Expert Review of External Applications:
• Provides peer review of applications prior to submission
• Allow 6-8 weeks prior to application deadline
• Suggest external reviewers
• External reviewers are compensated
• Form available at:
  http://research.unl.edu/facultyresources/exreview.php
Funding Announcement Newsletter:

• Weekly list of funding opportunities by email
• Federal agencies, foundations, other sources
• Soon to be “customizable”
• Contact Tisha Mullen to be added to list
  TGilreathMullen2@UNL.edu
• Searchable archive at:
  http://research.unl.edu/proposaldevelopment/funding.php
Faculty Resources:

- Research Nebraska (biomed experts directory)
- Quad Chart Template & FAQs
- Research Development Fellows Program (RDFP)
- NSF Data Management Plans
- UNL Core Facilities
- Grant-Writing Seminar
- Limited Submissions
- Submit Your Journal Cover

http://research.unl.edu/for-researchers/
Future

Hatch Projects Webinar
Tuesday, March 17 at 3:00

Conversations on Competitive Grants
USDA NIFA Overview
Dr. Jeanette Thurston
(NIFA National Program Leader)
Friday, March 27, 2015 at 9:30
Questions?

Deb Hamernik  
DHamernik2@UNL.edu  

Rick Koelsch  
RKoelsch1@UNL.edu

Tisha Gilreath Mullen  
TGilreathMullen2@UNL.edu