

Developing Grant Proposals

Purdue grant writing strategies and assistance

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Assistant Director of Research Development Services

Proposal Coordination

**Office of the Vice President for Research
and Partnerships**

Grant Writing Assistance and Resources

Overview

Getting Started

Storyline Strategy

Request Grant Writing Help

Boilerplate Text

Data Management Plans

Biomedical Research
Development

Self-Help Tools

Broader Impacts

Agency Resources

Grant Writing Support

Welcome to the Research Development Services grant writing support site. Here you can access resources for your proposal development as well as request hands-on help from our team of grant writers. If you have any questions, contact

sbond@purdue.edu



GETTING
STARTED



STORYLINE
STRATEGY



REQUEST A
GRANT WRITER



BOILERPLATE
TEXT



DATA MANAGEMENT
PLANS



BIOMEDICAL RESEARCH
DEVELOPMENT



SELF-HELP
TOOLS



BROADER
IMPACTS



AGENCY
RESOURCES

Research Development Services Website



Getting Started

Overview

Getting Started

Storyline Strategy

Request Grant Writing Help

Boilerplate Text

Data Management Plans

Biomedical Research
Development

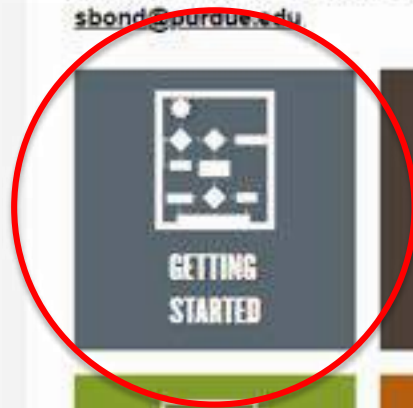
Self-Help Tools

Broader Impacts

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Grant Writing Support

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Getting Started: Quick Overview

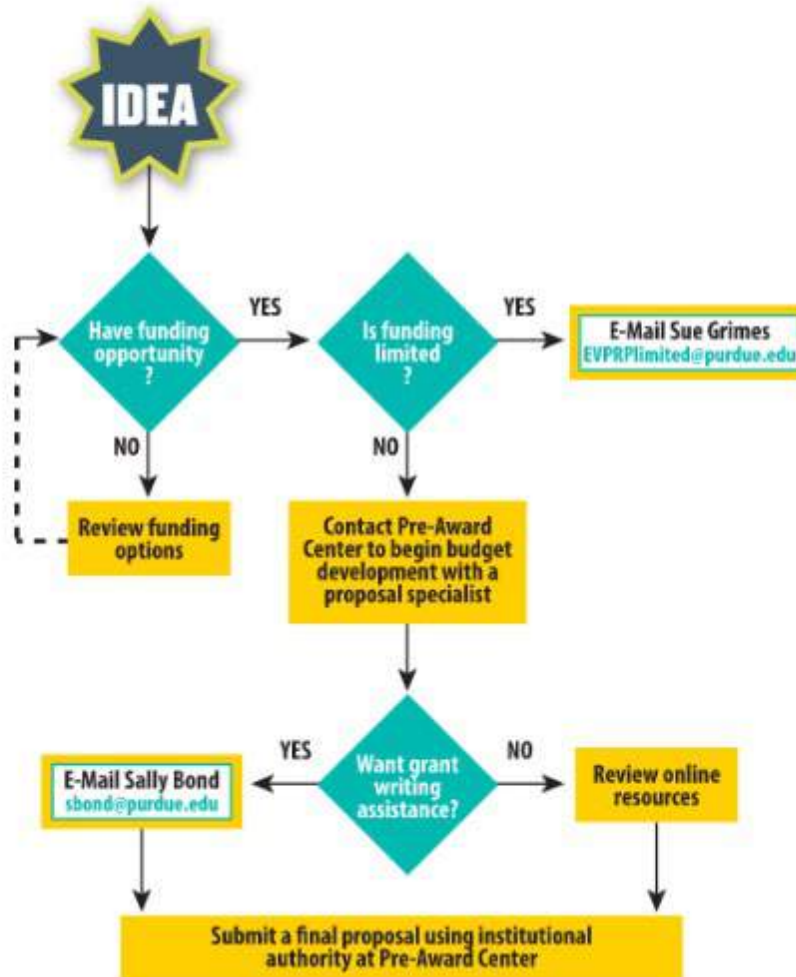
- Overview
- Getting Started
- Storyline Strategy
- Request Grant Writing Help
- Boilerplate Text
- Data Management Plans
- Biomedical Research Development
- Self-Help Tools
- Broader Impacts
- Agency Resources

A Visual Guide to the Grants Process at Purdue



Where are you in the process?

Click on each flowchart box to find more information.



Ask for Grant Writing Help

- Any award size
- Any agency
- External proposals only
- When? Sooner is better
- Concept storylines to shop your idea



Ask for Grant Writing Help



General 10-week project timeline:		1	2	3	4	5	6	7	8	9	10
Analysis and Planning											
Get LORs on web site for RFP											
Request previously successful proposals through PI											
Write 6-7 day Grant Writer for proposal											
Budget spreadsheet											
Website Overview											
Research proposal											
Develop ready-to-submit research proposal											
Review proposal											
Write introduction/abstract/summary											
Write Goals											
Research proposal and budget/financial history											
Program Officer Input											
Finalize RFP											
Finalize RFP submission											
Receive award notification/ planning											
Proposed Outline											
Develop outline/outline abstract											
Develop budget/outline if needed											
Identify appropriate model											
Partnerships											
Identify and develop partners											
Prepare "working paper" brochure or website											
Develop advisory committee											
Develop advisory committee letter											
Collect letters of commitment											
Management and Personnel											
Develop/submit organizational structure											
Collect letters of commitment											
Proposal Writing and Editing											
Assembly writing											
Review and edit proposal											
Complete PI form											
Prepare letter of intent											
Submit final proposal to PI											
Editing responses											
Write summary or abstract											

Red Text: Important to have agreed upon/ explicit text for problem over/letter prior to proposal writing

Ask for Grant Writing Help



General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Get feedback on idea from PI										
Identify previously successful proposals through PI										
Identify key funding sources for proposal budget spreadsheet										
Research project										
Identify key funding sources for proposal budget spreadsheet										
Identify key funding sources for proposal budget spreadsheet										
Identify key funding sources for proposal budget spreadsheet										
Program Office Input										
Develop budget										
Identify key funding sources for proposal budget spreadsheet										
Proposed Outline										
Identify key funding sources for proposal budget spreadsheet										
Partnerships										
Identify key funding sources for proposal budget spreadsheet										
Manager and Personnel										
Identify key funding sources for proposal budget spreadsheet										
Proposal Writing and Editing										
Identify key funding sources for proposal budget spreadsheet										

What is the problem?
What has been done already to address the problem?
What is the gap that still remains?
How do you propose to address the gap?

Light microscope allow direct observation of living specimens with microscopic resolution. The resolution of light microscope is limited to the resolution of visible light necessary to form an image. This resolution barrier has restricted our understanding of protein function, interactions, and dynamics in the cellular context particularly at the sub-cellular to nanometer length scale. Single molecule imaging technology (SMIT) or **SMITH** (Single Molecule Imaging Technology) and other sub-resolution of biological processes research tools.

However, high contrast, high resolution, and compatibility available SMIT used before using a standard 200 nm objective, instead with a special objective, limited light.

- Size, speed, resolution.** Traditional SMIT systems have minutes to hours to acquire an image. whereas most SMIT systems acquire at the second frame rate [1].
- Field of view and live imaging.** Many biological processes happen deeper in the cell, rather than in 200 nm depth, which cannot be reached with conventional SMIT [2].
- Phototoxicity.** Traditional SMIT required laser intensities in the range of ~ 1-5 W/cm² generating large heat, cell damage, photobleaching, and therefore false colored images, damaging cells, and bleaching [3].
- Strong reliance on user's expertise.** SMIT requires abundant customized modules from people with distinct working behaviors and require extensive user expertise. Data analysis and visualization demands computational expertise and is time-consuming [4]. This lack of an autonomous acquisition pipeline and visualization, analysis, and visualization tools, reduces SMIT's user-friendliness, making SMIT

Note: Important to have agreed-upon explicit text for problem description in proposal writing

Smart and Connected Communities (S&CC)

PROGRAM SOLICITATION
 NSF 19-564

REPLACES DOCUMENT(S):
 NSF 18-520



National Science Foundation

Directorate for Computer and Information Science and Engineering
 Division of Computer and Network Systems
 Division of Information and Intelligent Systems
 Director of Computing and Communications: Foundational

Directorate for Education and Human Resources
 Division of Learning, Informal, and Informal Settings

Directorate for Engineering
 Division of Civil, Mechanical, and Manufacturing Innovation
 Division of Electrical, Communications and Cyber Systems

Directorate for Social, Behavioral and Economic Sciences
 Division of Behavioral and Cognitive Systems
 Division of Societal and Economic Sciences

Letter of Intent Due Dates (Required): July 5 p.m. (submitter local time)
 August 05, 2019

Proposals for Integrated Research: Due Dates
 First Proposal Due Dates (Required): July 21 p.m. (submitter local time)
 September 30, 2019

Bring knowledge and
 combine light-sheet
 microscopes with speed
 alike. We will provide
 the rest.

Preparing for a Successful Meeting with Your Program Officer

- You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:**
 - Make contact early (at least several months in advance).
 - Do not make a "cold call." Email a one-page concept paper along with your agency booklet and request a phone appointment to discuss.
 - Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email standup@purdue.edu to request help.
- Why a one-pager?** Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance, highlight the logic of your approach, and allow targeted rather than general feedback. Many program officers will not read more than one page since multiple pages represent a proposal *in vivo* rather than *in vivo* *in vivo*. While you will not be told if you are "funding," the program officer can assess for program fit.

For NIH Use Specific Aims Page

- Start with storyline:**
 - What is the basic "wobbly" problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
- Briefly mention why this team is ideal for the project.**
- Aim X: Use a bold, concrete objective for each aim.** Describe each aim in one to three sentences that convey why this work needs to be done as well as what is new.
- End with paragraph on expected outcomes.**

For All Other Funding Agencies Use Concept Page

- Start with storyline:**
 - What is the problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
- List your goals/objectives.**
- Describe why this team is ideal for the project.**
- Overview methodology.**
- Summarize impact of your success.**



Office of the Executive Vice President for Research and Partnerships

Ask for Grant Writing Help



General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Get a clear sense of what is at stake										
Identify primary success metrics										
Build a list of stakeholders for ongoing insight										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										
Program Officer Input										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										
Proposed Outline										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										
Partnerships										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										
Manager and Personnel										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										
Proposal Writing and Editing										
Develop a strategy										
Identify key metrics										
Identify key stakeholders										
Identify key goals										

*Note: Important to have agreed-upon explicit text for problem creation prior to proposal writing

What is the problem?
What has been done already to address the problem?
What is the gap that still remains?
How do you propose to address this gap?

Light microscopy allows direct observation of living organisms with moderate speed (10² images/s) and a field of view that covers the scale of most cellular and molecular biology (10³ μm). This technology has provided our understanding of cellular function, interactions, and dynamics in the cellular context. Careful use of the technology is necessary to maximize length scale, depth, resolution, imaging frequency, or field of view. **Wide-field, high-resolution, live-cell, time-lapse microscopy** and **live-cell, sub-resolution, high-speed microscopy** are two emerging technologies that address these needs.

However, both custom-built and commercially available SMIS systems have been using a standard 1000x magnification with a standard camera resolution (limited to 1000x1000 pixels).

Slow speed. Traditional SMIS systems have minutes to hours to acquire an image. Whereas most cellular events occur at the second time scale (10⁰ s).

Limited to 2D and low resolution. Many biological processes happen deeper in the cellular volume than in 2D. Also, systems which cannot be viewed with conventional SMIS (10³ μm).

Phototoxicity. Traditional SMIS requires laser intensities in the range of ~1-10 W/cm² (powering large field-of-view cameras) and therefore has limited depth penetration, causing cell and tissue damage.

Strong reliance on user's expertise. SMIS requires abundant specialized expertise from people with distinct skillsets: behavior and require extensive user expertise. Data analysis and visualization demands computational expertise and time-consuming (10³ s). This lack of an autonomous acquisition system has been a major barrier to widespread adoption of SMIS technology.

Smart and Connected Communities (S&CC)

PROGRAM SOLICITATION
 NSF 19-564

REPLACES DOCUMENT(S):
 NSF 18-520

National Science Foundation

Directorate for Computer and Information Science and Engineering
 Division of Computer and Network Systems
 Director of Information and Intelligent Systems
 Director of Computing and Communications Foundations

Directorate for Education and Human Resources
 Division of Learning, Programs, and Technical Education

Directorate for Engineering
 Division of Civil, Mechanical, and Manufacturing Innovation
 Division of Electrical, Communications and Cyber Systems

Directorate for Social, Behavioral, and Economic Sciences
 Division of Behavioral and Cognitive Systems
 Division of Societal and Economic Sciences

Letter of Intent Due Dates (required): July 2, 2019; submission deadline: August 15, 2019

Required for Integrated Research: April 15, 2019

Final Proposal Due Date(s): July 2, 2019; submission deadline: September 30, 2019

Using microscope (microscope) light-sheet microscope with speed (light). We will provide (light-sheet microscope) to you.

1. What is the problem?
 - What has been done already to address the problem?
 - What is the gap that still remains?
 - How do you propose to address this gap?

2. Why is this important?
 - Why is this important to the field?
 - Why is this important to the community?
 - Why is this important to the nation?

3. What are the goals?
 - What are the specific goals of the project?
 - How do you plan to achieve these goals?

4. What are the methods?
 - What methods will you use to address the problem?
 - How do you plan to validate your results?

5. What are the risks?
 - What are the potential risks of the project?
 - How do you plan to mitigate these risks?

6. What are the budget and personnel requirements?
 - How do you plan to fund the project?
 - Who will be working on the project?

7. What are the expected outcomes?
 - What are the specific outcomes of the project?
 - How do you plan to disseminate your results?

8. What are the broader impacts?
 - How do you plan to benefit the community?
 - How do you plan to benefit the nation?

9. What are the references?
 - What are the key references for this project?

10. What are the contact information?
 - Who is the principal investigator?
 - Who is the contact person for questions?

- Preparing for a Successful Meeting with Your Program Officer**
- You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:
 - Make contact early (at least several months in advance).
 - Do not make a "cold call." Email a one-page concept paper along with your agency booklet and request a phone appointment to discuss.
 - Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email rdpartnerships@purdue.edu to request help.
 - Why a one-pager? Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance, highlight the logic of your approach, and allow targeted rather than general feedback. Many program officers will not read more than one page since multiple pages represent a proposal *in vivo* rather than *in silico* review. While you will not be told if you are "funding," the program officer can assess for program fit.
 - For NIH Use Specific Aims Page
 - Start with storyline:
 - What is the basic "health" problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
 - Briefly mention why this team is ideal for the project.
 - Aim X: Use a bold, concrete objective for each aim. Describe each aim in one to three sentences that convey why this work needs to be done as well as what is new.
 - End with paragraph on expected outcomes.
 - For All Other Funding Agencies Use Concept Page
 - Start with storyline:
 - What is the problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
 - List your goals/objectives.
 - Describe why this team is ideal for the project.
 - Overview methodology.
 - Summarize impact of your success.

Ask for Grant Writing Help



General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Get a clear view of what you are doing										
Secure previously successful proposals										
Make a list of potential funding opportunities										
Identify potential funding opportunities										
Write a proposal										
Submit proposals										
Write a grant proposal										
Write a grant proposal										
Write a grant proposal										
Program Officer Input										
Get a clear view of what you are doing										
Secure previously successful proposals										
Make a list of potential funding opportunities										
Identify potential funding opportunities										
Write a proposal										
Submit proposals										
Write a grant proposal										
Write a grant proposal										
Write a grant proposal										
Partnerships										
Get a clear view of what you are doing										
Secure previously successful proposals										
Make a list of potential funding opportunities										
Identify potential funding opportunities										
Write a proposal										
Submit proposals										
Write a grant proposal										
Write a grant proposal										
Write a grant proposal										
Manager and Personnel										
Get a clear view of what you are doing										
Secure previously successful proposals										
Make a list of potential funding opportunities										
Identify potential funding opportunities										
Write a proposal										
Submit proposals										
Write a grant proposal										
Write a grant proposal										
Write a grant proposal										
Proposal Writing and Editing										
Get a clear view of what you are doing										
Secure previously successful proposals										
Make a list of potential funding opportunities										
Identify potential funding opportunities										
Write a proposal										
Submit proposals										
Write a grant proposal										
Write a grant proposal										
Write a grant proposal										



15 Faculty

22 Post Doc

13: NS & PhD

1. **MISSION STATEMENT**

- 1.1. What is your mission?
- 1.2. What are your goals?
- 1.3. What are your objectives?
- 1.4. What are your outcomes?

2. **JUSTIFICATION**

- 2.1. Why is this project important?
- 2.2. How does this project align with your mission and objectives?
- 2.3. How will you measure success?
- 2.4. How will you disseminate your findings?

3. **BUDGET**

- 3.1. How much money do you need?
- 3.2. How will you spend the money?
- 3.3. How will you track and report on the money?

4. **CONCLUSION**

5. **APPENDICES**

6. **REFERENCES**

What is the problem?

What has been done already to address the problem?

What is the gap that still remains?

How do you propose to address this gap?

Light microscope allows direct observation of living cells with moderate speed (30-100 frames/sec). High resolution (sub-cellular) or wide field-of-view (whole cell) light microscopy is necessary to understand cellular function, interactions and dynamics in the cellular context. Conventional fluorescence microscopy requires the use of fluorescently labeled components, the substrate is often thin and static, and the resolution is limited.

However, with custom-built and commercially available SIMS light microscopes using a standard but technically complex wet-mount system, cellular activity linked to light is possible.

• **Size, speed, field-of-view**: Traditional SIMS systems have to be used to acquire an image. Whereas most light microscopes look at the cell level, SIMS can be used to acquire an image of the whole cell.

• **Cost**: Traditional SIMS systems are expensive (up to \$1M) and require a lot of space.

• **Phototoxicity**: Traditional SIMS requires laser excitation in the range of 400-500 nm, which can cause phototoxicity and reduce the viability of cells.

• **Strong reliance on user's expertise**: SIMS requires abundant specialized knowledge from people with distinct skillsets and require extensive user expertise. Data analysis and visualization requires computational expertise and is time-consuming (3-5 days). This lack of an autonomous acquisition system can significantly reduce the number of cells that can be imaged, limiting statistical power.

• **Next**: Important to have agreed-upon explicit text for problem statement prior to proposal writing.

Smart and Connected Communities (S&CC)

Using nanoscope light-sheet microscope with speed, We will provide you with everything you need to succeed.

PROGRAM SOLICITATION

NSF 19-564

REPLACES DOCUMENT(S):
NSF 18-520

National Science Foundation

Directorate for Computer and Information Science and Engineering
Division of Computer and Network Systems
Division of Information and Intelligent Systems
Division of Computing and Communications Foundations

Directorate for Education and Human Resources
Division of Learning, Programs and Applied Biology

Directorate for Engineering
Division of Civil, Mechanical and Manufacturing Innovation
Division of Electrical, Communications and Cyber Systems

Directorate for Social, Behavioral and Economic Sciences
Division of Behavioral and Cognitive Sciences
Division of Societal and Economic Sciences

Letter of Intent Due Dates (required) (due by 5 p.m., eastern coast time)
August 05, 2019

Proposal Due Dates (required) (due by 5 p.m., eastern coast time)
September 05, 2019

Preparing for a Successful Meeting with Your Program Officer

- You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:**
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 - Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email partnerships@purdue.edu to request help.
- Why a one-pager?** Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance. Highlight the top of your agency's, and also targeted other funder general feedback. Many program officers will not read more than one page since multiple pages represent a proposal even rather than an idea review. While you will not be told if you are "fundingable," the program officer can advise for program fit.

For NIH Use Specific Aims Page

- Start with storyline:
 - What is the basic health problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
- Briefly mention why this team is ideal for the project.
- Aim X: Use a bold, concrete objective for each aim. Describe each aim in one to three sentences that convey why this work needs to be done as well as what is new.
- End with paragraph on expected outcomes.

For All Other Funding Agencies Use Concept Page

- Start with storyline:
 - What is the problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
- List your goals/objectives.
- Describe why this team is ideal for the project.
- Overview methodology.
- Summarize impact of your success.

Ask for Grant Writing Help



General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Program Officer Input										
Proposed Outline										
Partnerships										
Manager and Personnel										
Proposal Writing and Editing										



What is the problem?
What has been done already to address the problem?
What is the gap that still remains?
How do you propose to address the gap?

Light microscopy allows direct observation of living organisms with moderate speed (10³ resolution) but is limited to the resolution of conventional light microscopy (200 nm). This technology barrier has restricted our understanding of cellular function, interactions, and dynamics in the cellular context. Currently, all of the sub-100 nm phenomena (length scale, single molecule imaging, molecular dynamics, etc.) are inaccessible. This barrier is a major obstacle in the study of biological processes and cellular mechanisms.

However, both custom built and commercially available SLMs exist but are using a standard 100 nm beamwidth, limited by optical cavity geometry, limited in size.

Size, speed, resolution: Traditional SLMs systems have limited resolution to acquire an image. Addressing this barrier involves using an optical fiber waveguide.

1. Limited to 2D and low resolution: Many SLMs are limited to 2D and low resolution (100 nm) in 3D space which is not needed for biological processes.

2. Phototoxicity: Traditional SLMs require a large laser scan volume (population and 10³).

3. Strong reliance on user's expertise: SLMs demand significant background and require an extensive computational expertise and a lot of time to set up and operate.



Smart and Connected Communities (S&CC)

PROGRAM SOLICITATION
 NSF 19-564

REPLACES DOCUMENT(S):
 NSF 18-520

National Science Foundation

Directorate for Computer and Information Sciences and Engineering
 Division of Computer and Network Systems
 Division of Information and Intelligent Systems
 Director of Computing and Communications Programs

Directorate for Education and Human Resources
 Division of Learning, Programs, and Informal Education

Directorate for Engineering
 Division of Civil, Mechanical, and Manufacturing Innovation
 Division of Electrical, Communications and Cyber Systems

Directorate for Social, Behavioral and Economic Sciences
 Division of Behavioral and Cognitive Sciences
 Division of Societal and Economic Sciences

Letter of Intent Due Dates: Required (July 31, 9 a.m. eastern coast time)
 August 16, 2019

Required for Integrated Research: Deadlines
 First Proposal Due Date: (July 31, 9 a.m. eastern coast time)
 September 30, 2019

4. Theoretical Research and Methods

... (text) ...

4. Theoretical Research and Methods

... (text) ...

Theoretical Research and Methods

... (text) ...

Section 1.1: Implementation of Quantum Random Access Memory Using Quantum Channels

... (text) ...

Preparing for a Successful Meeting with Your Program Officer

- You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:
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 - Do not make a "cold call." Email a one-page concept paper along with your agency booklet and request a phone appointment to discuss.
 - Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email shandep@purdue.edu to request help.
- Why a one-pager? Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance, highlight the logic of your approach, and allow targeted others to provide feedback. Many program officers will not read more than one page; state multiple pages represent a proposal reviewer rather than a decision maker. While you will not be told "I am a fan/able," the program officer can assess for program fit.
- For NIH Use Specific Aims Page**
 - Start with storyline:
 - What is the basic health problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
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 - Aim X: Use a bold, concrete objective for each aim. Describe each aim in one to three sentences that convey why this work needs to be done as well as what is new.
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- For All Other Funding Agencies Use Concept Page**
 - Start with storyline:
 - What is the problem?
 - What has been done already to address this problem?
 - What is the gap that still exists?
 - How do you propose to address this gap?
 - List your goals/objectives.
 - Describe why this team is ideal for the project.
 - Overview methodology.
 - Summarize impact of your success.

PURDUE UNIVERSITY

Office of the Executive Vice President for Research and Partnerships

Ask for Grant Writing Help



REQUEST A GRANT WRITER

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Program Office Input										
Proposed Outline										
Partnerships										
Manager and Personnel										
Proposal Writing and Editing										



What is the problem?
What has been done already to address the problem?
What is the gap that still remains?
How do you propose to address the gap?

Light microscopy allows direct observation of living organisms with moderate speed (10 frames/sec) and resolution that reaches the resolution of conventional light microscopy (>200 nm). The technology barrier has restricted our understanding of order, function, and dynamics in the cellular cortex. Carriers of the sub-micron to micron-scale length scale, single molecule tracking (SMT) or TRACKING, has become the state-of-the-art and allows visualization of biological processes in real-time.

However, both custom built and commercially available SMTs are far from being a standard tool in biological research with several critical weaknesses listed below:

1. **Slow speed:** Traditional SMT systems have minutes to hours to acquire an image. Addressing cellular tracks occur at the temporal scale scale (10⁻³ s).
2. **Limited to 2D and low velocity:** Many SMT systems require users to track cells in 2D. In 3D, axial velocity, which is needed for photostability. Traditional SMTs require a large field of view to observe populations and (1).
3. **Strong reliance on user's expertise:** SMTs demand significant background and require extensive computational expertise and time to process and visualize data.

Insert Names Here

Academic Training	Location	Major	Degree & Year
Postdoctoral Fellowship	Location	Major	Degree & Year
Current Position	Location	Major	Degree & Year

This document may be used, in part, for the university. The use of the following system is not guaranteed. The university is not responsible for any damage or loss of data or information. The university is not responsible for any damage or loss of data or information. The university is not responsible for any damage or loss of data or information.

A. Professional Preparation
 Use the format below to list your professional preparation. Indicate the location, major, and degree and year. Indicate the location, major, and degree and year. Indicate the location, major, and degree and year.

B. Appointments
 List the dates, in chronological order, of all the individual's academic/professional appointments beginning with the current appointment. Indicate the location, major, and degree and year.

C. Products
 List the dates, in chronological order, of all the individual's academic/professional products beginning with the current appointment. Indicate the location, major, and degree and year.

LETTERS OF RECOMMENDATION

1. Obtain letters of recommendation from individuals who can speak to your qualifications and potential. Letters should be written by individuals who are familiar with your work and can provide specific examples of your achievements.

LETTERS OF SUPPORT FROM OTHER AGENCIES

1. Obtain letters of support from other agencies that are interested in your work. Letters should be written by individuals who are familiar with your work and can provide specific examples of your achievements.

Smart and Connected Communities

PROGRAM SOLICITATION
 NSF 19-564

REPLACES DOCUMENT(S):
 NSF 18-520

National Science Foundation

Directorate for Computer and Information Sciences and Division of Computer and Information Sciences
 Director of Information and Intelligent Systems
 Director of Computing and Communications Research

Directorate for Science and Human Resources
 Director of Learning, Training, and Education Research

Directorate for Engineering
 Director of Civil, Mechanical, and Manufacturing Innovation
 Director of Electrical, Communications and Cyber Systems

Directorate for Social, Behavioral and Economic Sciences
 Director of Behavioral and Cognitive Sciences
 Director of Behavioral and Economic Sciences

Letter of Intent Due Dates: Required (July 31 or October 15, 2019)
 April 15, 2019

Required for Integrated Research: Dual Proposals
 Full Proposal Due Dates: (July 31 or October 15, 2019)
 September 30, 2019

PERSPECTIVES ON BROADER IMPACT

OTHER SIGNIFICANT PRODUCTS

1. []
2. []
3. []
4. []

d. Strenuous Activities
 List the dates, in chronological order, of all the individual's academic/professional and scholarly activities that demand the highest degree of intellectual and/or physical effort.

4. Theoretical Research and Methods
 List the dates, in chronological order, of all the individual's academic/professional and scholarly activities that demand the highest degree of intellectual and/or physical effort.

Theoretical Preparation
 List the dates, in chronological order, of all the individual's academic/professional and scholarly activities that demand the highest degree of intellectual and/or physical effort.

Section 1.1: Implementation of Quantum Entanglement Access Platform Using Quantum Chromatography
 List the dates, in chronological order, of all the individual's academic/professional and scholarly activities that demand the highest degree of intellectual and/or physical effort.

Preparing for a Successful Meeting with Your Program Officer

1. You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:
 - Make contact early (at least several months in advance).
 - Do not make a "cold call." Email a one-page concept paper along with your agency booklet and request a phone appointment to discuss.
 - Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email independent.edu to request help.
2. Why a one-pager? Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance, highlight the logic of your approach, and allow lengthier follow-up general feedback. Many program officers will not read more than one page since multiple pages represent a proposal, not a letter to the program officer.

If you are "Invitable," the program officer can assess for program fit.

For All Other Funding Agencies Use Concept Page

1. Start with storyline:
 - What is the problem?
 - What has been done already to address the problem?
 - What is the gap that still exists?
 - How do you propose to address the gap?
2. List your goals/objectives. Describe why this team is ideal for the project.
3. Overview methodology.
4. Summarize impact of your success.

DUPLICATE

Office of the Executive Vice President for Research and Partnerships

Proposal Preparation Process

Tailored and intentional plan

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP										
Identify previously successful proposals										
Identify PI										
Notify Pre-Award Center for assigned budget specialist										
<i>Problem Overview</i>										
<ul style="list-style-type: none"> What is the problem What has already been done to address problem What gaps remain How we propose to address gaps 										
<i>Vision</i>										
<i>Goals</i>										
<i>Identify proposal win themes/discriminators</i>										
Program Officer Input										
Contact PO	initial									
Team debrief on meeting										
Refine initial analysis/planning										
Proposed Outline										
<i>Discuss/refine outline structure</i>										
More detailed outline, if needed										
Identify graphics needed										
Partnerships										
Recruit collaborative partners										
Produce "talking points" brochure or website										
Recruit industry affiliates										
Recruit advisory board members										
Collect letters of commitment										
Management and Personnel										
<i>Identify basic management structure</i>										
Collect biosketches										
Proposal Writing and Editing										
Assign writing										
Write section components										
Compile 1 st draft										
Project team 1 st edit										
Any outside review input/edit										
Editing iterations										
Write summary or abstract										

Red Text: Important to have agreement (and explicit text for problem overview) prior to proposal writing

Key Strategies

Strategies for the strongest proposal submission

- tell a compelling story
- respond to solicitation
- answer “Why Purdue?”
- know your reviewer
- conduct internal review

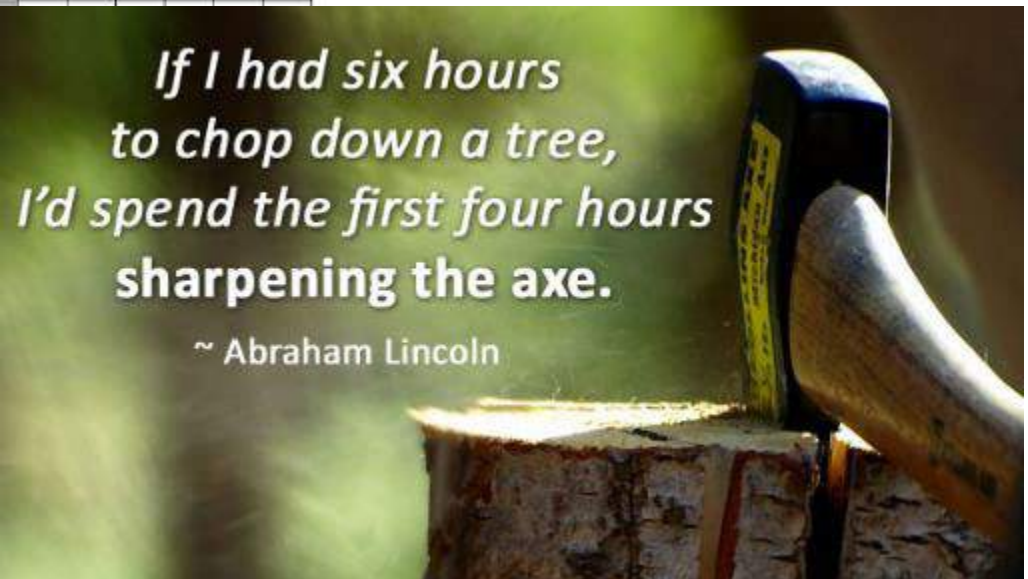
Build the Storyline

Storyline first!

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP										
Identify previously successful proposals										
Identify PI										
Notify Pre-Award Center for assigned specialist										
Problem Overview										
• <i>What is the problem?</i>										
• <i>What has already been done to address problem?</i>										
• <i>What gaps remain?</i>										
• <i>How we propose to address gaps:</i>										
Vision										
Goals										
Identify proposal win themes/discriminators										
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Any outside review input/edit										
Editing iterations										
Write summary or abstract										

Red Text: Important to have agreement (and explicit text for problem)



Build the Storyline

Gap analysis

- tell a compelling story

- respond to solicitation

- answer

- know your audience

- conduct a gap analysis

Good science is a story that...

- begins with a problem
- provides coherence in narrative
- hooks reviewer so weaknesses are not fatal
- sets “north star”

Build the Storyline

Four key questions

- tell a compelling story

- respond to the literature

- answer the question

- know your audience

- conduct a literature search

- What is the problem?
- What has been done already to address the problem?
- What is the gap that remains?
- How do you propose to address this gap?

Build the Storyline

Funnel of logic flow

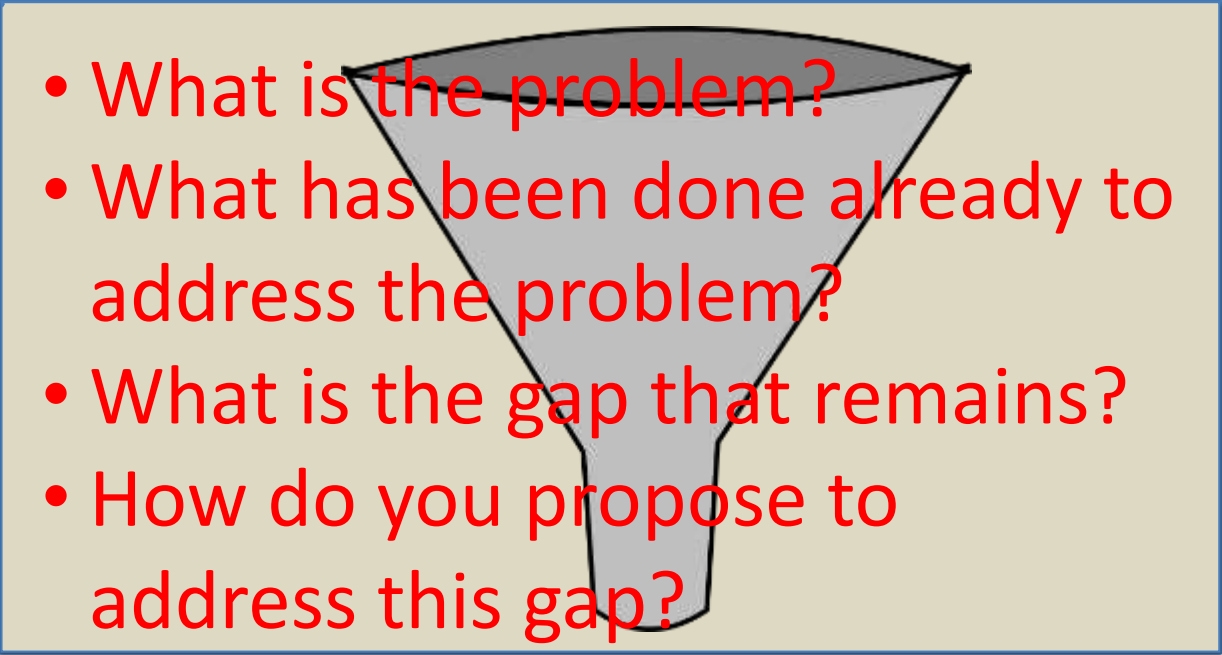
- tell a compelling story

• respond to the liability

• answer the question

• know your audience

• conduct research

- 
- What is the problem?
 - What has been done already to address the problem?
 - What is the gap that remains?
 - How do you propose to address this gap?

Build the Storyline

Example narrative for NIH

A Significance

The NIH is committed to translating basic biomedical research into clinical practice and thereby impacting global human health¹, and Francis Collins identifies high-throughput technology as one of five areas of focus for the NIH's research agenda². For many diseases, researchers have identified successful novel therapeutics or research probes by applying technical advances in automation to high-throughput screening (HTS) using either biochemical or cell-based assays³⁻⁶. Researchers are using genetic perturbations such as RNA interference or gene overexpression in cell-based HTS assays to identify genetic regulators of disease processes as potential drug targets⁷⁻⁹. However, the molecular mechanisms of many diseases that deeply impact human health worldwide are not well-understood and thus cannot yet be reduced to biochemical or cell-based assays.

Ideally, researchers could approach disease from a phenotypic direction, in addition to the traditional molecular approach, by searching for chemical or genetic regulators of disease processes in whole model organisms rather than isolated cells or proteins. Moving HTS towards more intact, physiological systems also improves the likelihood that the findings from such experiments accurately translate into the context of the human body (e.g., in terms of toxicity and bioavailability), simplifying the path to clinical trials and reducing the failure of potential therapeutics at later stages of testing. In fact, for some diseases, a whole organism screen may actually be necessary to break new therapeutic ground; in the search for novel therapeutics for infectious agents, for example, it is widely speculated that the traditional approach of screening for chemicals that directly kill bacteria *in vitro* has been largely exhausted¹⁰. Our work recently identified six novel classes of chemicals that cure model organisms from infection by the important human pathogen *E. faecalis* through mechanisms distinct from directly killing the bacterium itself¹¹. Anti-infectives with new mechanisms of action are urgently needed to combat widespread antibiotic resistance in pathogens.

Enabling HTS in whole organisms is therefore recognized as a high priority (NIH PAR-08-024)^{12,13}. *C. elegans* is a natural choice. Manually-analyzed RNAi and chemical screens are well-proven in this organism, with dozens completed¹⁴⁻¹⁶. Many existing assays can be adapted to HTS; instrumentation exists to handle and culture *C. elegans* in HTS-compatible multi-well. Its organ systems have high physiologic similarity and genetic conservation with humans^{17,18}. *C. elegans* is particularly suited to assays involving visual phenotypes; physiologic abnormalities and fluorescent markers are easily observed because the worm is mostly transparent. The worms follow a stereotypic development pattern that yields identically-appearing adults^{19,20}, such that deviations from wild-type are more readily apparent.

The bottleneck that remains for tackling important human health problems using *C. elegans* HTS is image analysis (NIH PA-07-320)^{21,22}. It has been recently stated, "Currently, one of the biggest technical limitations for large-scale RNAi-based screens in *C. elegans* is the lack of efficient high-throughput methods to quantitate lethality, growth rates, and other morphological phenotypes"²³. Our proposal to develop image analysis algorithms to identify regulators of infection and metabolism in high-throughput *C. elegans* assays would bring image-based HTS to whole organisms, and have the following impact:

Carolina Wählby of the Broad Institute

<http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx>

Storyline to Concept Paper



Preparing for a Successful Meeting with Your Program Officer

You are more likely to receive valuable insight into the funding potential of your idea if you follow these steps:

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- Do not make a “cold call.” Email a one-page concept paper along with your agency biosketch and request a phone appointment to discuss.
- Develop your concept paper using the format below. Grant writers in the Office of Research and Partnerships can help you develop this text. Email sbond@purdue.edu to request help.

Why a one-pager? Distilling your ideas into a brief summary — one that starts with a compelling storyline — will best communicate project relevance, highlight the logic of your approach, and allow targeted rather than general feedback. Many program officers will not read more than one page since multiple pages represent a proposal review rather than an idea review. While you will not be told if you are “fundable,” the program officer can assess for program fit.

For NIH Use Specific Aims Page

Start with storyline:

- What is the human health problem?
- What has been done already to address this problem?
- What is the gap that still exists?
- How do you propose to address this gap?

Briefly mention why this team is ideal for the project.

Aim X: Use a bold, concrete objective for each aim. Describe each aim in one to three sentences that convey why this work needs to be done as well as what and how.

End with paragraph on expected outcomes.

For All Other Funding Agencies Use Concept Page

Start with storyline:

- What is the problem?
- What has been done already to address this problem?
- What is the gap that still exists?
- How do you propose to address this gap?

List your goals/objectives.

Describe why this team is ideal for the project.

Overview methodology.

Summarize impact of your success.

Build the Storyline

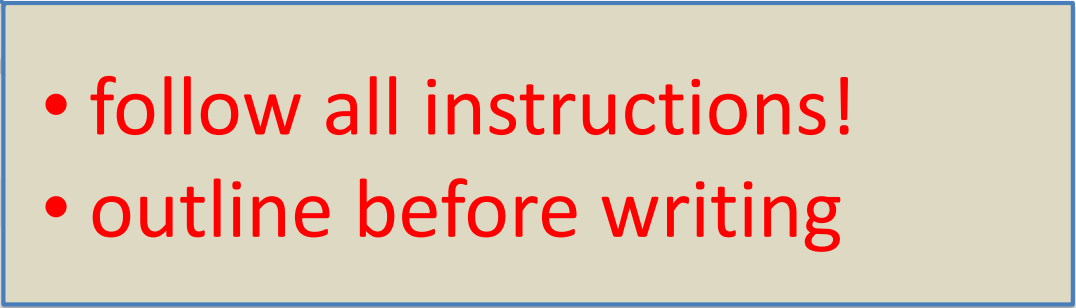
One-page...taste of your entire grant in a single, bite-sized piece

It forces you to distill all aspects down to their essences and to find a way of piecing things together that is economical, coherent, logical, and compelling [...] is totally unforgiving, revealing problems in the clarity of your thinking and presentation, weaknesses in the logic of your research, vagueness in your methods, and failures in the all-important 'so what?' realm. Given the luxury of length, additional verbiage has a way of camouflaging weaknesses (at least from the writer but not so often from the reviewer).

—Robert Levenson, UC-Berkeley

Key Strategies

Addressing common trouble spots

- tell a compelling story
 - respond to solicitation
 - answer “V
 - know you
 - conduct internal review
- 
- follow all instructions!
 - outline before writing

Respond to Solicitation

Know the agency guidelines as well as solicitation



Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET)

PROGRAM SOLICITATION

NSF 21-596

REPLACES DOCUMENT(S):

NSF 21-527



National Science Foundation

Directorate for Engineering
Division of Chemical, Bioengineering, Environmental and Transport Systems

Preliminary Proposal Due Date(s) (required) (due by 5 p.m. submitter's local time)

October 21, 2021

September 19, 2022

September 17, Annually Thereafter

Preliminary Proposal Deadline Date

Full Proposal Deadline(s) (due by 5 p.m. submitter's local time)

January 31, 2022

January 31, Annually Thereafter

Full Proposal Deadline Date

IMPORTANT INFORMATION AND REVISION NOTES

Revisions to the solicitation include:

- The preliminary proposal and full proposal deadlines have been changed from that defined in NSF 21-527.
- The priority research areas have been updated to reflect current scientific needs and Division priorities.
- Proposal preparation and submission instructions have been updated for added clarity.

Preliminary Proposals submitted in response to the October 1, 2021 deadline should be submitted in accordance with the NSF Proposal & Award Policies & Procedures Guide (PAPPG) (NSF 20-1), which is effective for proposals submitted, or due, on or after June 1, 2020.

Full Proposals submitted in response to this solicitation should be submitted in accordance with the revised PAPPG (NSF 22-1), which is effective for proposals submitted, or due, on or after October 4, 2021.

SUMMARY OF PROGRAM REQUIREMENTS

General Information

Program Title:

Environmental Convergence Opportunities in Chemical, Bioengineering, Environmental, and Transport Systems (ECO-CBET)

Synopsis of Program:

Creating effective solutions to our most pressing environmental and sustainability challenges requires imaginative thinking - the kind that evolves when researchers from disparate fields, expertise, or perspectives fully immerse themselves in work toward a common goal. The National Academies of Sciences, Engineering and Medicine (NASEM), in their report "Environmental Engineering for the 21st Century: Addressing Grand Challenges," identified five critical challenges we must address as a society: sustainably supply food, water, and energy; curb climate change and adapt to its impacts; design a future without pollution and waste; create efficient, healthy, and resilient cities; and

Respond to Solicitation

Sleuth what was funded previously to identify trends

- What type of science and how does it compare to yours?
- What was team composition?
- What type of education integration?
- What type of institution?
- What type of budget?

Respond to Solicitation

Agency websites often show what was previously funded.

The image shows a screenshot of the National Science Foundation (NSF) website. At the top left is the NSF logo with the tagline "WHERE DISCOVERIES BEGIN". A search bar is located at the top right. Below the logo is a navigation menu with the following items: FUNDING, AWARDS, DISCOVERIES, NEWS, PUBLICATIONS, STATISTICS, ABOUT NSF, and FASTLANE. The "FUNDING" menu is expanded, showing a list of options: Search Funding Opportunities, Browse Opportunities A-Z, Recent Opportunities, Due Dates, Preparing Proposals, Policies & Procedures, Ment Review, Interdisciplinary Research, Transformative Research, and About Funding. The main content area features a large banner image of a child in a winter hat with the text "Community college students on STEM path" and a "FULL STORY" button. Below the banner is a URL: <http://www.nsf.gov/>. At the bottom of the page, there are three main sections: "Advancing the Sciences", "Funding & Supporting", and "Inspiring & Educating". Below these sections are six featured articles, each with a small image, a title, and a date:

- Snow, frost, and crowded:** Mammal trails amplify tick-borne illness (September 10, 2014)
- Researchers develop unique waste cleanup** for rural areas (September 10, 2014)
- UCChicago-Argonne National Lab team improves solar cell efficiency** (September 10, 2014)
- UCI team is first to capture motion of single molecule in real time** (September 16, 2014)
- Coen spots:** Study finds important genes in defense response (September 12, 2014)
- NSF awards \$10.8 million in early concept grants for brain research** (August 18, 2014)

www.nsf.gov

Respond to Solicitation

Each program page has “what has been funded” and map of recent awards.

National Science Foundation
WHERE DISCOVERIES BEGIN

GUIDE LINKS

SEARCH

FUNDING AWARDS DISCOVERIES NEWS PUBLICATIONS STATISTICS ABOUT NSF FASTLANE

Funding

1 2

Find Funding
A-Z Index of Funding Opportunities
Recent Funding Opportunities
Upcoming Due Dates
Advanced Funding Search
Interdisciplinary Research
How to Prepare Your Proposal
About Funding

Proposals and Awards

Proposal and Award Policies and Procedures Guide
Introduction
Proposal Preparation and Submission
Grant Proposal Guide
Grants.gov Application Guide
Award and Administration
Award and Administration Guide

Award Conditions
Other Types of Proposals
Merit Review
NSF Outreach
Policy Office

GRANTS.GOV™

Industrial Innovation and Partnerships

Partnerships for Innovation: Accelerating Innovation Research- Technology Translation (PFI: AIR-TT)

CONTACTS

Name	Email	Phone	Room
Barbara H. Kenny	bkenny@nsf.gov	(703) 293-4867	

PROGRAM GUIDELINES

Solicitation [14-560](#)

DUE DATES

Full Proposal Deadline Date: October 2, 2014
Letter of Intent Deadline Date: March 13, 2015
Full Proposal Deadline Date: April 14, 2015

SYNOPSIS

The NSF Partnerships for Innovation (PFI) program within the Division of Industrial Innovation and Partnerships (IIP) is an umbrella for two complementary subprograms, Accelerating Innovation Research (AIR) and Building Innovation Capacity (BIC). Overall, the PFI program offers opportunities to connect new knowledge to societal benefit through translational research efforts and/or partnerships that encourage, enhance and accelerate innovation and entrepreneurship. The subject of this solicitation is PFI: AIR-Technology Translation (PFI: AIR-TT). The PFI: AIR-TT solicitation serves as an early opportunity to move previously NSF-funded research results with promising commercial potential along the path toward commercialization. Projects are supported to demonstrate proof-of-concept, prototype, or scale-up while engaging faculty and students in entrepreneurial/innovative thinking.

WEBINAR: A webinar will be held within 6 weeks of the release date of this solicitation to answer any questions about this solicitation. Details will be posted on the IIP website (<http://www.nsf.gov/eng/ipp/pfi/air-tt.jsp>) as they become available.

[What Has Been Funded \(Recent Awards Made Through This Program, with Abstracts\)](#)

[Map of Recent Awards Made Through This Program](#)

[News](#)

email Print Share

Feedback ↑ Top

[What Has Been Funded \(Recent Awards Made Through This Program, with Abstracts\)](#)

[Map of Recent Awards Made Through This Program](#)

[News](#)

Respond to Solicitation

NIH RePORTer <http://projectreporter.nih.gov/reporter.cfm>.

The screenshot displays the NIH RePORTer website interface. At the top, the NIH logo and 'Research Portfolio Online Reporting Tools (RePORT)' are visible. A search bar is located in the top right corner. Below the header, there are navigation tabs for 'QUICK LINKS', 'RESEARCH', 'ORGANIZATIONS', 'WORKFORCE', 'FUNDING', 'REPORTS', and 'LINKS & DATA'. The main content area is titled 'NIH RePORTER' and includes a 'CHECK OUT FEDERAL RePORTER' button. Below this, there are tabs for 'QUERY', 'BROWSE NIH', and 'MATCHMAKER'. The 'QUERY' tab is active, showing a 'SUBMIT QUERY' and 'CLEAR QUERY' button. The 'Fiscal Year (FY)' is set to 'Active Projects' for the 'Current FY is 2014'. The 'RESEARCHER AND ORGANIZATION' section contains several input fields: 'Principal Investigator (PI) / Project Leader' (with a note to use '*' for wildcards and a link to enter several names), 'Organization' (with a 'LOOKUP' button and a note to enter at least 3 characters), 'Department', 'Organization Type', 'City', 'State', 'Country', 'Congressional District', and 'DUNS Number'. The 'TEXT SEARCH' section includes a 'Text Search (Logic)' field with radio buttons for 'And', 'Or', and 'Advanced', and a 'Search in' section with checkboxes for 'Projects', 'Publications', and 'News'. There are also options to 'Limit Project search to' (Project Title, Project Terms, Project Abstracts) and 'Limit Publication search to' (Start Year: 2013, End Year: 2014). The 'PROJECT DETAILS' section includes fields for 'Project Number/ Application ID' (with a note to use '*' for wildcards and a link to enter multiple numbers), 'Program Officer (PO)', 'Project Start Date', and several dropdown menus for 'Agency/Institute/Center' (with 'Admin' and 'Funding' checkboxes), 'NIH Spending Category', 'Funding Mechanism', 'Award Type', 'Activity Code', and 'Study Section'. A note at the bottom indicates 'Standing CSR study sections only'.

Respond to Solicitation

NIH RePORTer <http://projectreporter.nih.gov/reporter.cfm>.

Search Results

[Back to Query Form](#) [Save Query](#) [Share Query](#)

Export All Projects

PROJECTS PUBLICATIONS PATENTS CLINICAL STUDIES DATA & VISUALIZE MAP LINKS NEWS & MORE													
There were 3208 results matching your search criteria. Records per page: 25 Show/Hide Search Criteria													
Click on the column header to sort the results 1 2 3 4 ... 128 129 130 Page 1 of 130 Next Last													
T: Application Type, Act: Activity Code, Project: Admin IC, Serial No., Year: Support Year/Supplement/Amendment													
<input type="checkbox"/>	T	Act	Project	Year	Sub #	Project Title	Contact PI Project Leader	Organization	FY	Admin IC	Funding IC	FY Total Cost by IC	Similar Projects
<input type="checkbox"/>	S	B01	MH094473	03		LEARNING, NEURAL SIGNALING OF CONTROL, AND EARLY ADVERSITY IN DEPRESSION	ABERCROMBE, HEATHER C	UNIVERSITY OF WISCONSIN-MADISON	2014	NMH	NMH	\$493,154	
<input type="checkbox"/>	S	P50	MH086404	05		DOPAMINE DYSFUNCTION IN SCHIZOPHRENIA	AL-DARQAM, ANISSA	NEW YORK STATE PSYCHIATRIC INSTITUTE	2014	NMH	NMH	\$1,805,264	
<input type="checkbox"/>	I	K91	MH102428	03A1		DECODING NEURAL SYSTEMS UNDERLYING AFFECTIVE PROSODY IN CHILDREN WITH AUTISM	ARRAMS, DANIEL ARTHUR	STANFORD UNIVERSITY	2014	NMH	NMH	\$178,164	
<input type="checkbox"/>	S	K25	NS058573	05		TIME-RESOLVED MR METHODS FOR ANALYSIS OF CONTRAST AND FLOW VELOCITY IN ANEURYSMS	ACEVEDO-BOLTON, GARREL ALEJANDRO	UNIVERSITY OF CALIFORNIA, SAN FRANCISCO	2012	NINDS	NINDS	\$150,101	
<input type="checkbox"/>	S	B01	CA171651	02		DEVELOPMENT OF GOOGLE SYSTEM FOR FLUORESCENCE IMAGE-GUIDED SURGERY	ACHLEVU, SAMUEL	WASHINGTON UNIVERSITY	2014	NCI	NCI	\$558,269	
<input type="checkbox"/>	S	B01	MH094743	04		MOTIVATED MEMORY AS THERAPEUTIC TARGET	ADCOCK, RACHEL ALISON	DUKE UNIVERSITY	2014	NMH	NMH	\$483,300	
<input type="checkbox"/>	S	P50	MH094258	03	5306	CONNECTIVITY OF THE SOCIAL DECISION-MAKING SYSTEM	ADDOLPHS, RALPH	CALIFORNIA INSTITUTE OF TECHNOLOGY	2014	NMH	NMH	\$370,781	
<input type="checkbox"/>	S	P50	MH094258	03		THE NEUROBIOLOGY OF SOCIAL DECISION-MAKING	ADDOLPHS, RALPH	CALIFORNIA INSTITUTE OF TECHNOLOGY	2014	NMH	NMH	\$1,914,032	
<input type="checkbox"/>	S	K99	EY022824	02		THE CAUSAL ROLE OF INFERIOR TEMPORAL CORTEX IN OBJECT RECOGNITION	AFRAZ, SEYED REZA	MASSACHUSETTS INSTITUTE OF TECHNOLOGY	2014	NEI	NEI	\$106,833	

Respond to Solicitation

Outline before you write. Be consistent with formatting.

Example of NSF-style proposal outline

1. RATIONALE [2-5 pages]

• Storyline

- What is the problem?
- What has been done already?
- What is the gap that still remains?
- What do you propose to do to address this gap?

Goals and Objectives

- List goals and objectives (per goal)

Team Partnership

- Team expertise
- Targeted teacher and/or community college faculty participants
- Institutional commitment

Broader Impacts

- curriculum accessed by underrepresented students through targeted teacher recruitment
- community-based research activities
- integrating research activities into computing-related courses in local high schools
- role models from HCBU partner on HLURC webinars
- presentation to parent-teacher organizations to include assessment results from DLRC-collected metrics
- presentations at both technology education conferences as well as K-12 STEM learning

2. NATURE OF TEACHER ACTIVITIES [3-5 pages]

- Need clearly articulated research projects and activities
 - Map to goals/objectives
- Teachers must be involved in research project for at least 6 weeks
- Must have orientation session at beginning of the program for the teachers to acquaint them with laboratory methods, safety procedures, analytical methods, etc.
- Address approach to research training being undertaken

Research Project

- Include overview statement of spectrum of research projects

Project 1

- Provide detailed descriptions of examples of research projects
 - Include who is doing what role
- Present plans that will ensure the development of RET participant-faculty interaction and communication
- How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project 2

- Provide detailed descriptions of examples of research projects
 - Include who is doing what role
- Present plans that will ensure the development of RET participant-faculty interaction and communication
- How will you facilitate development of collegial relationships and interactions as teachers work closely in teams with university faculty and students?

Project Timetable

- Need Gantt-style chart such as this
- Overview instance

Program Initiative	Year one	Year Two	Year Three	Year Four	Year Five
UNIVERSITY Administration					
Advisory Board Meeting					
DMT Team and ODC meeting					
Meeting Academy					
Faculty/Teacher/Student					
Monthly goals					
Departmental Transformation					
Director's Forum					
Classroom/Workshop @ PC					
All Data Institutions					
Transformational Team Visits					
Workshop/Visiting Professors					
Workshops for Teachers/Students					
Building Networks					
Summer					
Workshop/Forum					
Evaluation and Assessment					
STEM Goals/Assessment					
Space Resource Assessment					
Coaching Mentors					
Teacher Academy (pre and off job)					
Articulation Studies					
Center and Youth					
Faculty					
Network Academy					
Technical Faculty Academy					
Dissemination					
Webinars					
ED Webinars in Academics					
Regional Academics Meeting					
Publications					
Final Report Presentation					

3. RESEARCH ENVIRONMENT [2-5 pages]

- Describe the experience and record of involvement with K-12 community college education and research of the PI
- Describe faculty who may serve as research mentors. Consider table such as

Mentor Name	Dept/School	Expertise

- Describe institution
 - Include emphasis on cross-disciplinary partnership and past record of success as cross-disciplinary collaborations

Key Strategies

Addressing common trouble spots

- tell a compelling story
 - respond to solicitation
 - answer “Why Purdue?”
 - know your audience
 - conduct research
- win differentiators of expertise, facilities, prior work, campus environment

Key Strategies

Addressing common trouble spots

- tell a compelling story
 - respond to solid feedback
 - answer “Why Fund?”
 - **know your reviewer**
 - conduct internal review
- writing for expert and non-expert
 - busy, rushed
 - did not choose to read your proposal

Know Your Reviewer

Be kind...you are not writing for yourself.

- use formatting as a roadmap
- be generous with white space
- fix grammar and proof proposal
- write clearly...shorter sentences

Know Your Reviewer

Parallel formatting provides a roadmap to help your reviewer

Example of NSF-style proposal outline

I. RATIONALE [2.5 pages]

- **Storyline**
 - What is the problem?
 - What has been done already?
 - What is the gap that still remains?
 - What do you propose to do to address this gap?

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Project 2

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 - Include who is doing what role
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- Need Gantt-style chart such as this
- Overview instance

Program Initiative	Year one	Year Two	Year Three	Year Four	Year Five
CHALLENGE! Administration					
Advisory Board Meeting					
DM Task for COC Meeting					
Marketing Academy					
Training for Teacher Skills					
MOU Signatures					
Departmental Transformation					
Efficient Faculty					
Classroom Work & PI					
All Time Activities					
Transformational Year Plans					
MOU II Signing Ceremony					
Proposals and Task Force					
Building Networks					
System					
MOU II Status					
Evaluation and Assessment					
STEM Critical Activities					
Space Resource System					
CRS/ST Mission					
Monitor Mission goal and off goal					
Additional Topics					
Team of Work					
Faculty					
Network Analysis					
External Project Analysis					
Discussion					
MOU III					
MOU III Mission in Academia					
MOU III Mission in Society					
MOU III Mission					
MOU III Mission					

3. RESEARCH ENVIRONMENT [2.5 pages]

- Describe the experience and record of involvement with K-12/community college education and research of the PI
- Describe faculty who may serve as research mentors. Consider table such as

Mentor Name	Dept/School	Expertise

- Describe institution
 - Include emphasis on cross-disciplinary partnership and past record of success in cross-disciplinary collaborations

Know Your Reviewer

Parallel formatting provides a roadmap to help your reviewer

Research Strategy (usually 12 pages) Option 2 with common preliminary studies

A. Significance

B. Innovation

C. Approach

- Overview sentence on the team and the approach

Preliminary Studies (for all the aims together)

- For all the aims together

Title of Specific Aim #1 (verbatim from your specific aims section)

- Introductory paragraph

Research Design

Expected Outcomes

Potential Problems and Alternative Strategies

Title of Specific Aim #2 (verbatim from your specific aims section)

- Introductory paragraph

Research Design

Expected Outcomes

Potential Problems and Alternative Strategies

Title of Specific Aim #3 (verbatim from your specific aims section)

- Introductory paragraph

Research Design

Expected Outcomes

Potential Problems and Alternative Strategies

Timetable

- Use Gantt chart

Future Directions (optional)

Know Your Reviewer

Avoid dense text by adding white space

Format 1

The NEES collaboration created a total of 15 advanced equipment sites for experimental work dedicated to the reduction of the earthquake threat (Figure 4). The current experimental reach of the equipment ranges from the marine to the geotechnical to the structural environments and can address almost any technical question that may arise on issues related to the safety of the built-environment in earthquakes. Development of this massive array of experimental capabilities demanded an intense and sustained effort. In retrospect, it would appear that the leaders of research groups involved in the creation of the 15 sites were totally absorbed, as they should have been, in the proper development of a magnificent experimental capability across the U.S. Unfortunately, there were three unplanned and unintended results: 1) a negative perception among a portion of the research community that equipment access was not equitable; 2) most, if not all, of the research work initiated has not yet been of a quality to transform the engineering community culture; and 3) the information technology infrastructure, which had initially inspired the NEES concept of a network of interconnected laboratories, has yet to reach its potential. The metaphor of a powerful fleet of battleships at anchor is not irrelevant to the current status. Our goal is to get the fleet moving in harmony.

Rapid advance in engineering knowledge and capability requires at least four ingredients: 1) a driving need; 2) a large community of well-educated professionals; 3) financial support; and 4) competing centers of research and development. As emphasized by the tragic disaster in Wenchuan, PRC, in May 2008, there continues to be a critical need for advances in earthquake-loss reduction. Considering the seismic histories of population centers such as San Francisco, Los Angeles, Kammandu, and Istanbul, there is no basis for expecting the earthquake threat to abate in the foreseeable future. In large measure because of the encouragement of the National Science Foundation since the early 1970's, the U.S. is blessed with an impressively large community of professionals well trained in earthquake engineering and related sciences. The first two ingredients are very much in place. As long as the U.S. continues to have a strong economic profile and maintains its proven ability to plan beyond the immediate future, financial support for research and development in earthquake issues will continue. Our mission, then, is for NEES to take the lead in providing the competing centers of research and development to achieve catalysis of the existing essential ingredients as described below. The seminal idea for the NEES network was the creation of an experimental-research infrastructure with many visions and capabilities at different research centers connected with a single purpose through the opportunity provided by information technology. The objective of creating a successful equipment infrastructure has been achieved. A driving challenge now is to resuscitate what was intended to be the cortex of the system: the information technology (IT) that can enable the required catalysis of ideas.

Our overall strategy is designed to: 1) inspire the NEES researcher to pursue a more ambitious research agenda; 2) entice the rest of the research community to compete for the opportunity to benefit from the sites; 3) encourage academic researchers to interact with the professional engineers in order to accelerate the implementation of new knowledge in practice; and 4) develop a NEES community that will include all individuals, institutes, agencies, corporations, professional societies, and non-governmental organizations (NGO) interested in protecting society from the harmful consequences of earthquakes.

A brief look at the history of civilizations will reveal that the nuclear ingredient in their development has been the "agora," or the market. Using the opportunities provided by information technology, we plan to develop the intellectual equivalent of the agora in order to get the "fleet at anchor" moving at an ever-increasing pace. We will employ operational excellence, innovative computational tools, outreach that advances knowledge, and an environment for the catalysis of ideas. Among the qualitative and quantitative performance metrics for measuring our success and developing a compelling basis for continued operation are: 1) the *satisfaction* of users (including both physical and analytical researchers); NEEShub users; and education, outreach and training targets; 2) a *greater diversification* of users, research sponsors, operations sponsors, outreach community, and the NEEShub community; 3) *increased research productivity* in earthquake engineering, including the increased use of NEES equipment by remote users; 4) *greater impact* on codes, technical committees, professional societies, and research directions; and, eventually, 5) *reduced losses* from earthquakes.

Format 2

The NEES collaboration created a total of 15 advanced equipment sites for experimental work dedicated to the reduction of the earthquake threat (Figure 4). The current experimental reach of the equipment ranges from the marine to the geotechnical to the structural environments and can address almost any technical question that may arise on issues related to the safety of the built-environment in earthquakes. Development of this massive array of experimental capabilities demanded an intense and sustained effort. In retrospect, it would appear that the leaders of research groups involved in the creation of the 15 sites were totally absorbed, as they should have been, in the proper development of a magnificent experimental capability across the U.S. Unfortunately, there were three unplanned and unintended results: 1) a negative perception among a portion of the research community that equipment access was not equitable; 2) most, if not all, of the research work initiated has not yet been of a quality to transform the engineering community culture; and 3) the information technology infrastructure, which had initially inspired the NEES concept of a network of interconnected laboratories, has yet to reach its potential. The metaphor of a powerful fleet of battleships at anchor is not irrelevant to the current status. Our goal is to get the fleet moving in harmony.

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Strategic Plan

Our overall strategy is designed to: 1) inspire the NEES researcher to pursue a more ambitious research agenda; 2) entice the rest of the research community to compete for the opportunity to benefit from the sites; 3) encourage academic researchers to interact with the professional engineers in order to accelerate the implementation of new knowledge in practice; and 4) develop a NEES community that will include all individuals, institutes, agencies, corporations, professional societies, and non-governmental organizations (NGO) interested in protecting society from the harmful consequences of earthquakes.

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Know Your Reviewer

Sloppy writing = sloppy science



Know Your Reviewer

Mechanics matter. Sloppy writing = sloppy science

Elemental mapping of animal tissues has been investigated, and results have been documented.

changed to:

We investigated elemental mapping of animal tissues and documented results.

Know Your Reviewer

Be concise. Less is better.

There are a growing number of scientists **who** believe the system is capable of addressing user demands.

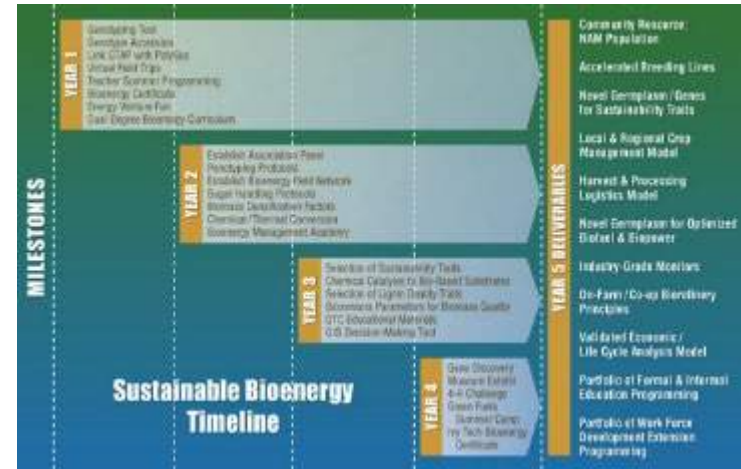
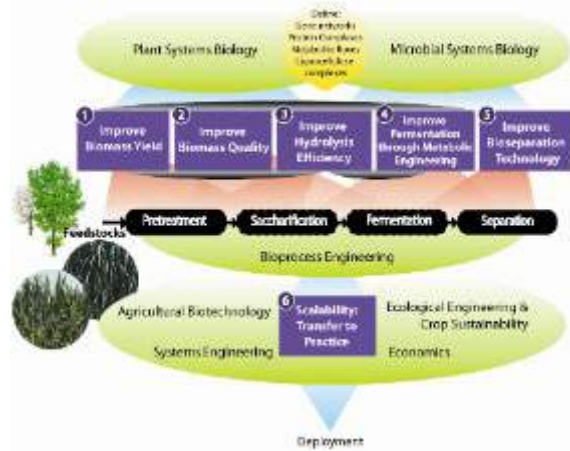
(17 words)

A growing number of scientists believe the system can address user demands.

(12 words)

Know Your Reviewer

Use high-quality, easy-to-read graphics for conceptual and organizational info



Know Your Reviewer

Use visuals to summarize narrative when possible.

Program Initiatives	Year 1	Year 2	Year 3	Year 4	Year 5
Indiana administration					
Membership approved by Executive Council for working committees
Partner retreat
Create I-hub
Create Passport tracking
External Advisory Board meetings
Annual Alliance-wide conference
Goal 1: Alliance-wide practices					
Campus director monthly centralized training
Augmented training sets
Faculty/students training on I-hub
Cross-Alliance recruiting, including veterans
Goal 2: Effective community college partnership facilitating transfer to four-year STEM programs					
Co-mentored domestic research experience at partner campuses
Co-mentored international research experience
Industry guest speakers
Cross-Alliance teaching symposia and workshops with community college faculty
Goal 3: Aligning experiences with Tinto's principles of iteration					
Map activities and identify gaps
Pair scholars with mentors
Create individualized portfolios
Map incentives to Passport Badges
Cross-Alliance international research cohort
Disseminate model-based best practices
Goal 4: Research longitudinal model of Scholar development					
Compile a list of Scholar attributes
Test and validate Scholar attributes
Collect Scholar data
Analyze Scholar data and portfolios
Conduct interviews with Scholars
Evaluation and Assessment					
Formative site visits
Formative focus groups/interviews
Formative web-based surveys
Formative analysis and reporting
Summative data plan development
Summative quantitative data gathering
Summative analysis and final reporting

Key Strategies

Addressing common trouble spots

- tell a compelling story
- respond to solicitation
- answer “Why?”
- know your audience
 - planned from beginning
 - formal or informal
- conduct internal review

Internal Review

New eyes on your draft before submission

General 10-week project timeline:

	1	2	3	4	5	6	7	8	9	10
Analysis and Planning										
Distribute documents noted in RFP										
Identify previously successful proposals										
Identify PI										
Notify Pre-Award Center for assigned specialist										
Problem Overview										
<ul style="list-style-type: none"> ▪ <i>What is the problem</i> ▪ <i>What has already been done to address problem</i> ▪ <i>What gaps remain</i> ▪ <i>How we propose to address gaps</i> 										
Vision										
Goals										
Identify proposal win themes/discriminators										
Program Officer Input										
Contact PO	initial									
Team debrief on meeting										
Refine initial analysis/planning										
Proposed Outline										
Discuss/refine outline structure										
More detailed outline, if needed										
Identify graphics needed										
Partnerships										
Recruit collaborative partners										
Produce "talking points" brochure or website										
Recruit industry affiliates										
Recruit advisory board members										
Collect letters of commitment										
Management and Personnel										
Identify basic management structure										
Collect biosketches										
Proposal Writing and Editing										
Assign writing										
Write section components										
Compile 1 st draft										
Project team 1 st edit										
Any outside review input/edit										
Editing iterations										
Write summary or abstract										

Red Text: Important to have agreement (and explicit text for problem overview) prior to proposal writing

Internal Review

Because sometimes what is obvious to you is not obvious to others





**GETTING
STARTED**



**STORYLINE
STRATEGY**



**REQUEST A
GRANT WRITER**



**BOILERPLATE
TEXT**



**DATA MANAGEMENT
PLANS**



**BIOMEDICAL RESEARCH
DEVELOPMENT**



**SELF-HELP
TOOLS**



**BROADER
IMPACTS**



**AGENCY
RESOURCES**

Broader Impacts and Education Plans



What are Broader Impacts?



Broader impacts are the potential to benefit society and contribute to the achievement of specific, desired societal outcomes. They may be accomplished through:

1. the research itself
2. activities directly related to research projects
3. activities supported by and complementary to the project

A broader impact **statement** describes benefits and outcomes—not logistics.



"Cords" of research, education and outreach, and diversity-related activities integrate through your project to deliver **broader impacts**. For instance:

- Fuller Participation of Women, Persons with Disabilities, and Underrepresented Minorities in STEM
- Improved STEM Education and Educator Development
- Increased Public Scientific Literacy
- Improved Well-Being of Individuals
- Development of a Diverse, Globally Competitive Workforce
- Increased Partnerships among Academia, Industry, Government, and Non-Profits
- Improved National Security
- Increased U.S. Economic Competitiveness
- Informed Public Policy
- Enhanced Research and Education Infrastructure

(Coming Soon!)

Example Broader Impact Statements from Funded NSF Proposals

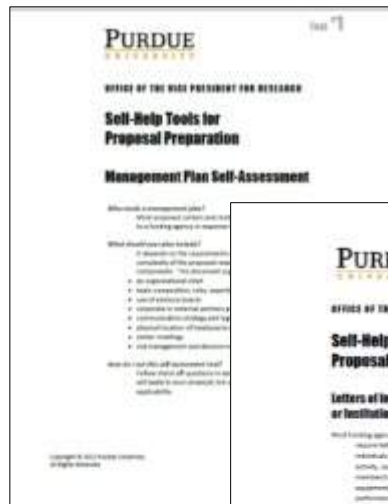
Steps to Develop an Education and Workforce Development Plan

Tips for Broadening Participation and Diversity, Equity, and Inclusion Plans

Other Broader Impact Resource

Request a Broader Impact Consultation

Templates and Step-by-Step Guidance



Drop-in Text for Resource/Facilities



The screenshot shows the Purdue e-Pubs website. At the top, the Purdue University logo is on the left, and "Purdue e-Pubs" is on the right. Below the logo is a navigation menu with "Home", "About", "FAQ", and "My Account". The main content area is divided into a left sidebar and a main right section. The sidebar contains sections for "Search" (with a search box and "Advanced Search" link), "Links" (with links to "Purdue Libraries" and "Purdue University Press Journals"), "Links for Authors" (with a link to "Policies and Help Documentation"), and "Browse" (with links to "Collections", "Disciplines", and "Authors"). At the bottom of the sidebar is the Purdue University logo and the text "Libraries and School of Information Studies". The main right section features a large banner image of a building and a fountain. Below the image is the heading "OFFICE OF RESEARCH AND PARTNERSHIPS" and a paragraph of text describing the office's role. A "Follow" button is located to the right of the text. Below this is a section titled "Browse the Office of Research and Partnerships Collections:" with two links: "University General Facility Boilerplate Descriptions" and "University Research Core Facility Boilerplate Descriptions". At the bottom of the page, there is a reader information box showing "Reader from: Montreal, Quebec, Canada" and "Macromolecular Crystallography" by "C Nidhaus Sloussy, Tim Schmidt, Purdue University Office of Research and Partnerships".

Data Management Plans



DMP Development Resources

- [Purdue Libraries Data Management Guidelines](#)
- [Purdue-Affiliated dmptool.org](#) for data management plans templates, sample documents, and funder guidance.
- [Purdue's Research Repository \(PURR\)](#) contains step-by-step instructions for completing the data management plan requirements and citable boilerplate text that can be inserted into your DMP.
- [Data Storage Options at Purdue](#) explains different data storage options available to the Purdue community

Sample DMPs from funded Purdue projects

[NSF Division of Engineering Education and Centers \(CISTAR 2017\)](#)

[NASA Space Technologies Research Institutes \(Dyke 2019\)](#)

[NSF Division of Behavioral and Cognitive Sciences \(Ma 2017\)](#)

[NSF Division of Research on Learning \(Ryu 2018\)](#)

Questions?