Successful Grant Writing Strategies

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Proposal Coordination
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and Partnerships

PURDUE UNIVERSITY

Persuasive Writing

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										
Problem Overview • *What is the problem* • *What has already been done to address problem* • *What gaps remain* • *How we propose to address gaps*										
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 1st draft										
Project team 1st 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

Remember…you are not the audience. Don’t write for yourself.

- show something important is at stake
- answer “So what?”
- make it memorable, not complex, and have clear logic flow
- back it up with references…not anecdotal.

Build the Storyline

A good story is more important than good data.

Jon Lorsch, director of the National Institute of General Medical Sciences at NIH,

quoting

Francis Collins, director of NIH

Build the Storyline

Gap analysis

- tell a compelling story
- respon
- answe
- know y
- conduc

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

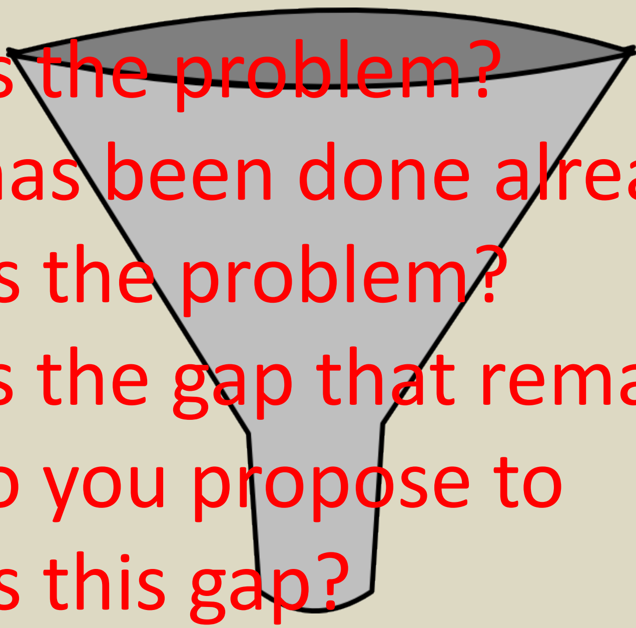
- tell a compelling story
- respo
- answe
- know
- condu

- 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
- respon
- answe
- know
- condu



- 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

Start with phrase answers (Example from Brenda Capobianco NSF IUSE)

What is the problem?

- Next generation standards highlight integration of engineering and technology into science education
- However, current K-12 science curriculum/pedagogy does not equip teachers to include engineering in their classroom. Particularly a problem at elementary level where teachers have less preparation in science and no formal exposure to engineering

What has been done to address this problem?

- Texas UTeach, Boston Museum of Science's Engineering is Elementary, Purdue's Science Learning through Engineering Design
- Integrate engineering design for **inservice** elementary teacher
- strong proof-of-concept that elementary teachers can effectively translate concepts

What is the gap that remains?

- despite strong local/regional impact, not scalable or sustainable
- requires continual district resourcing and limited capacity to reach 1.6 million elementary science teachers

How do you propose to address this gap?

- Immerse **preservice** teachers in authentic engineering design-based science learning

Build the Storyline

Turn phrases into narrative

Continued scientific and technological innovations are critical to fostering sustained economic growth, global competitiveness, and, most importantly, meeting an increased demand for STEM talent. To harness the nation's great scientific and technological potential, attention must be given to improving the state of STEM education and to build a robust STEM workforce (PhRMA, 2014). As noted by the President's Council of Advisors on Science and Technology, "the most important factor in ensuring excellence in K-12 STEM education is great STEM teachers" (PCAST, 2015). Compounding this demand for high-quality STEM teachers is the introduction of new academic standards (NGSS Lead States, 2013). Reform documents such as *A Framework for K-12 Science Education* (NRC, 2012) and the *Next Generation of Science Standards* (NGSS Lead States, 2013) highlight the significant role science and engineering practices play in building students' early understanding of the world around them. The *Framework* indicates that all children should develop competencies in engineering design, and the *NGSS* explicitly includes a "conceptual shift" toward "the integration of engineering and technology into the structure of science education." However, such an imminent shift cannot be realized without adjustment of K-12 science curriculum and pedagogy and a national *transformation in the preparation of K-12 teachers* so that teachers possess the knowledge and skills necessary to include the discipline of engineering in their classrooms. This is especially important at the elementary school level where teachers tend to have the most limited academic preparation in science (Abell, 2007; Appleton, 2007; Mellado, Blanco, & Ruiz, 1998) and essentially non-existent formal exposure to engineering (Cunningham & Carlsen, 2014; Wendell, 2014).

To fill this void in professional training of elementary science teachers, considerable national strides have been made to integrate engineering design for inservice elementary science teachers (Capobianco & Lehman, 2015; Capobianco & Rupp, 2014; Sargianis, Yang, & Cunningham, 2012; Yasar, et al., 2013; Yoon, at al., 2014). Programs such as the University of Texas's *UTeach Engineering*, Boston's Museum of Science's *Engineering is Elementary*, Purdue University's *Science Learning through Engineering Design (SLED) Partnership*, The John Hopkins University's *STEM Achievement in Baltimore Elementary Schools (SABES)*, and University of Minnesota's *Engr: TEAMS* are grounded in the delivery of high-quality, content-rich, engineering design-based experiences for inservice elementary science teachers. Results show strong proof-of-concept that elementary teachers can effectively translate engineering basics into the classroom environment. The successful NSF-funded SLED Partnership, for example, demonstrated that elementary inservice science teachers can develop deep conceptual knowledge of engineering practices, translate knowledge into teaching that facilitates students' science learning, and address both first and second-order classroom challenges with implementing engineering design-based science instruction (Capobianco & DeLisi, 2015; Capobianco, Lehman, & Kelley, 2015).

While such inservice training has had strong impact on students and teachers across various elementary school settings, a significant gap remains in developing a nationally scalable and sustainable solution. Current inservice efforts rely on an existing base of teaching experience, require continual district resourcing for on-site or workshop-oriented training, and have limited capacity to reach the more than 1.6 million elementary science teachers nationwide (NCES, 2015). We lack a strategic, research-based nationwide process for elementary science teacher preparation programs to answer the call for implementing new engineering standards (Capobianco, 2012, 2015; Wendell, 2014).

To address this gap in engaged student learning, we propose a research-based project that will create an innovative, scalable, and sustainable model for elementary science teacher preparation that can address the unprecedented need to prepare elementary science teachers to teach engineering practices nationwide. In our *IUSE Using Principles of Design to Advance Teacher Education (UPDATE)* project, we will draw on STEM and education expertise to collaboratively transform elementary science teacher preparation by immersing preservice teachers in authentic engineering design-based science learning tasks in a sequence of core required undergraduate science content courses. We will utilize the constructs of *situated learning* and *teacher as learner* to uncover, evaluate, and explain the multiple and diverse ways preservice elementary teachers learn engineering practices, how they begin to conceptualize engineering design, and how they most effectively teach elementary school science using engineering practices.

Build the Storyline

Carolina Wählby of the Broad Institute
http://www.niaid.nih.gov/researchfunding/grant/pages/appsamples.aspx

A Significance

The NIH is committed to translating basic biomedical research into clinical practice and thereby impacting global human health[1], and Francis Collins identifies high-throughput technology as one of five areas of focus for the NIH's research agenda[2]. 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 assays[3–6]. 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 targets[7–9]. 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 exhausted[10]. 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 itself[11]. 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 completed[14–16]. 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:**

Practice

- 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

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

Build the Storyline

Where do you put it?

- as soon as solicitation allows!
  - background, rational, vision and goals
- NIH
  - start of specific aims page and expanded version in significance section

What about in a Fellowship Application?

2018 GRFP Application

The 2018 GRFP competition is now accepting applications. Please see the Program Solicitation for full guidelines.

Application Components

The following material is required as part of the 2018 GRFP application.

- Personal, Relevant Background and Future Goals Statement
- Graduate Research Plan Statement ➡
- 3 Reference Letters
- Academic Transcripts

Below is the prompt for the Graduate Research Plan Statement:

Present an original research topic that you would like to pursue in graduate school. Describe the research idea, your general approach, as well as any unique resources that may be needed for accomplishing the research goal (i.e., access to national facilities or collections, collaborations, overseas work, etc.) You may choose to include important literature citations. Address the potential of the research to advance knowledge and understanding within science as well as the potential for broader impacts on society. The research discussed must be in a field listed in the Solicitation (Section X, Fields of Study).

Important questions to ask yourself before writing the statement:

1. What issues in the scientific community are you most passionate about?
2. Do you possess the technical knowledge and skills necessary for conducting this work, or will you have sufficient mentoring and training to complete the study?
3. Is this plan feasible for the allotted time and institutional resources?
4. How will your research contribute to the "big picture" outside the academic context?
5. How can you draft a plan using the guidelines presented in the essay instructions?
6. How does your proposed research address the Intellectual Merit and Broader Impacts criteria?

Key Strategies

Addressing common trouble spots

- tell a compelling story
- respond to solicitation
- answer “W
- know you
- conduct internal review

- follow all instructions!
- outline before writing

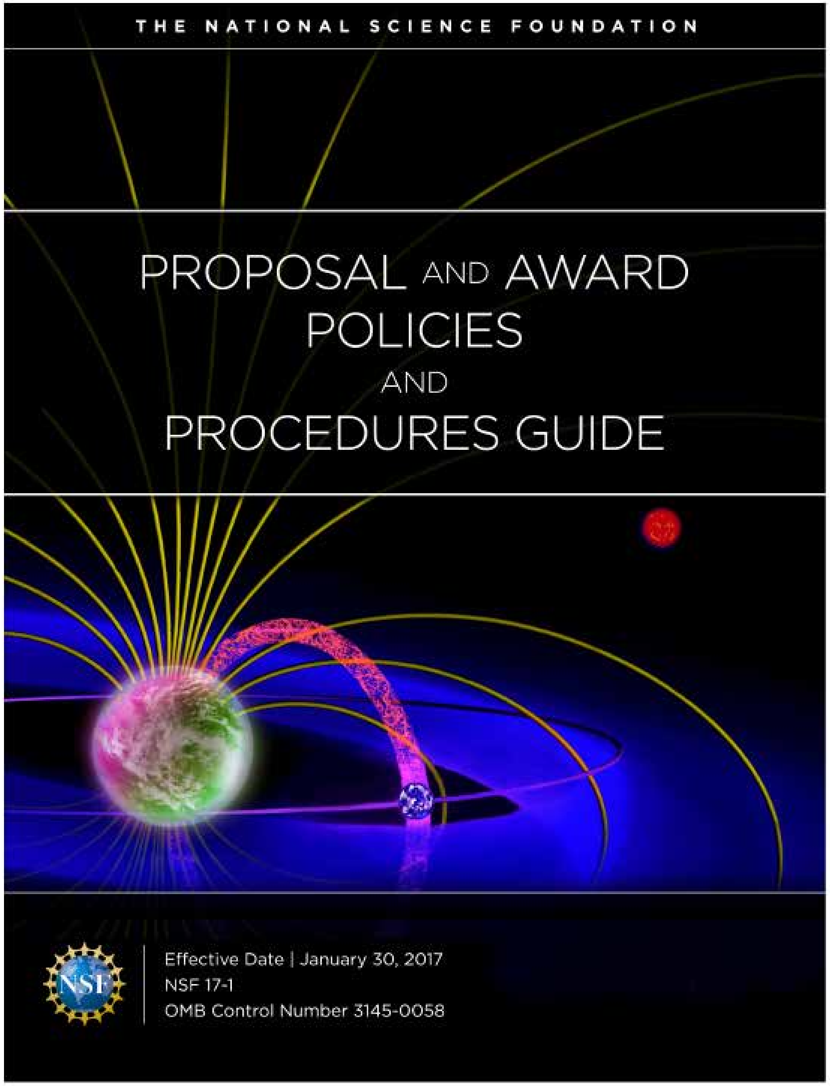
Respond to Solicitation

Do not be returned without review!!

- Eligibility, due date, length, margins
- But also…
  - prescriptive headings
  - merit review criteria in ***multiple*** locations
  - cited documents for language, rationale

Respond to Solicitation

Know the agency guidelines as well as solicitation



Faculty Early Career Development Program (CAREER)

Includes the description of NSF Presidential Early Career Awards for Scientists and Engineers (PECASE)

PROGRAM SOLICITATION
NSF 17-537

REPLACES DOCUMENT(S):
NSF 15-555

NSF

National Science Foundation

Directorate for Biological Sciences

Directorate for Computer & Information Science & Engineering

Directorate for Education & Human Resources

Directorate for Engineering

Directorate for Geosciences

Directorate for Mathematical & Physical Sciences

Directorate for Social, Behavioral & Economic Sciences

Office of Integrative Activities

Office of International Science and Engineering

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

July 19, 2017

Third Wednesday in July, Annually Thereafter

for BIO, CISE, EHR

July 20, 2017

Third Thursday in July, Annually Thereafter

for ENG

July 21, 2017

Third Friday in July, Annually Thereafter

for GEO, MPS, SBE

IMPORTANT INFORMATION AND REVISION NOTES

Eligibility requirements have been revised to clarify the required early-career status of applicants.

Support for senior personnel other than the PI that is commensurate with a limited collaborative role in the project is now allowed in the budget of the proposal or of a subrecipient.

Proposal due dates:

Directorate	2017 due dates	2018 due dates	2019 due dates
BIO, CISE, EHR	July 19, 2017	July 18, 2018	July 17, 2019
ENG	July 20, 2017	July 19, 2018	July 18, 2019
GEO, MPS, SBE	July 21, 2017	July 20, 2018	July 19, 2019

Any proposal submitted in response to this solicitation should be submitted in accordance with the revised *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 17-1), which is effective for proposals submitted, or due, on or after January 30, 2017.

Respond to Solicitation

Know general guidelines but solicitation overrides.

Part I Overview Information

Department of Health and Human Services

Participating Organizations
National Institutes of Health (NIH), (http://www.nih.gov/)

Components of Participating Organizations
This RFA is developed as a Roadmap initiative. All NIH Institutes and Centers participate in Roadmap initiatives. This RFA will be adminis

Title: Institutional Clinical and Translational Science Award (U54)

Announcement Type
This is a reissue of RFA-RM-06-002, which was released previously October 12, 2005.

Update: The following update relating to this announcement has been issued:

- March 22, 2007 - This RFA has been reissued as (RFA-RM-07-007).
- November 8, 2006 (NOT-RR-07-003) - See Notice NOT-RR-07-003 for clarification, Institutional Clinical and Translational Science

Request For Applications (RFA) Number: RFA-RM-07-002

Catalog of Federal Domestic Assistance Number(s)
93.389, 93.310

Key Dates
Release Date: August 22, 2006
Letters of Intent Receipt Date(s): December 18, 2006
Application Receipt Date: January 17, 2007
Peer Review Date(s): Summer 2007
Council Review Date(s): September 2007
Earliest Anticipated Start Date(s): September 30, 2007
Additional Information To Be Available Date (URL Activation Date): October 2006
Expiration Date: January 18, 2007

Due Dates for E.O. 12372

Not Applicable

Additional Overview Content

Executive Summary

- Growing barriers between clinical and basic research, along with the ever increasing complexities involved in conducting clinical r enterprise at a time when it should be expanding.
- The purpose of this initiative is to assist institutions to create a uniquely transformative, novel, and integrative academic home for C information technologies to promote the application of new knowledge and techniques to patient care. Clinical and Translational S

FORMS VERSION D SERIES
UPDATED MARCH 24, 2017

DEPARTMENT OF HEALTH & HUMAN SERVICES, USA

GENERAL INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES

SF424 (R&R) Application Packages

Guidance developed and maintained by NIH for preparing and submitting applications via Grants.gov to NIH and other PHS agencies using the SF424 (R&R)

Respond to Solicitation

True for fellowships also

Department of Health and Human Services

Part 1. Overview Information

Participating Organization(s)	National Institutes of Health (NIH)
Components of Participating Organizations	National Cancer Institute (NCI) National Eye Institute (NEI) National Heart, Lung, and Blood Institute (NHLBI) National Human Genome Research Institute (NHG National Institute on Aging (NIA) National Institute on Alcohol Abuse and Alcoholisr National Institute of Allergy and Infectious Disease National Institute of Arthritis and Musculoskeletal a National Institute of Biomedical Imaging and Bioer Eunice Kennedy Shriver National Institute of Child National Institute on Deafness and Other Commur National Institute of Dental and Craniofacial Resea National Institute of Diabetes and Digestive and Ki National Institute on Drug Abuse (NIDA) National Institute of Environmental Health Science National Institute of General Medical Sciences (NI National Institute of Mental Health (NIMH) National Institute of Neurological Disorders and St National Institute of Nursing Research (NINR) National Institute on Minority Health and Health Di National Library of Medicine (NLM) National Center for Complementary and Integrativ Division of Program Coordination, Planning and St Office of Research Infrastructure Programs (ORIP **Special Note:** Not all NIH Institutes and Centers p which ICs participate in this announcement and vi *Table of IC-Specific Information, Requirements* announcement will not consider applications for fu
Funding Opportunity Title	Ruth L. Kirschstein National Individual Predoctoral Fellov
Activity Code	F31 Predoctoral Individual National Research Ser

FORMS VERSION D SERIES

UPDATED MARCH 24, 2017

FELLOWSHIP INSTRUCTIONS FOR NIH AND OTHER PHS AGENCIES

SF424 (R&R) APPLICATION PACKAGES

Guidance developed and maintained by NIH for preparing and submitting applications via Grants.gov to NIH and other PHS agencies using the SF424 (R&R)

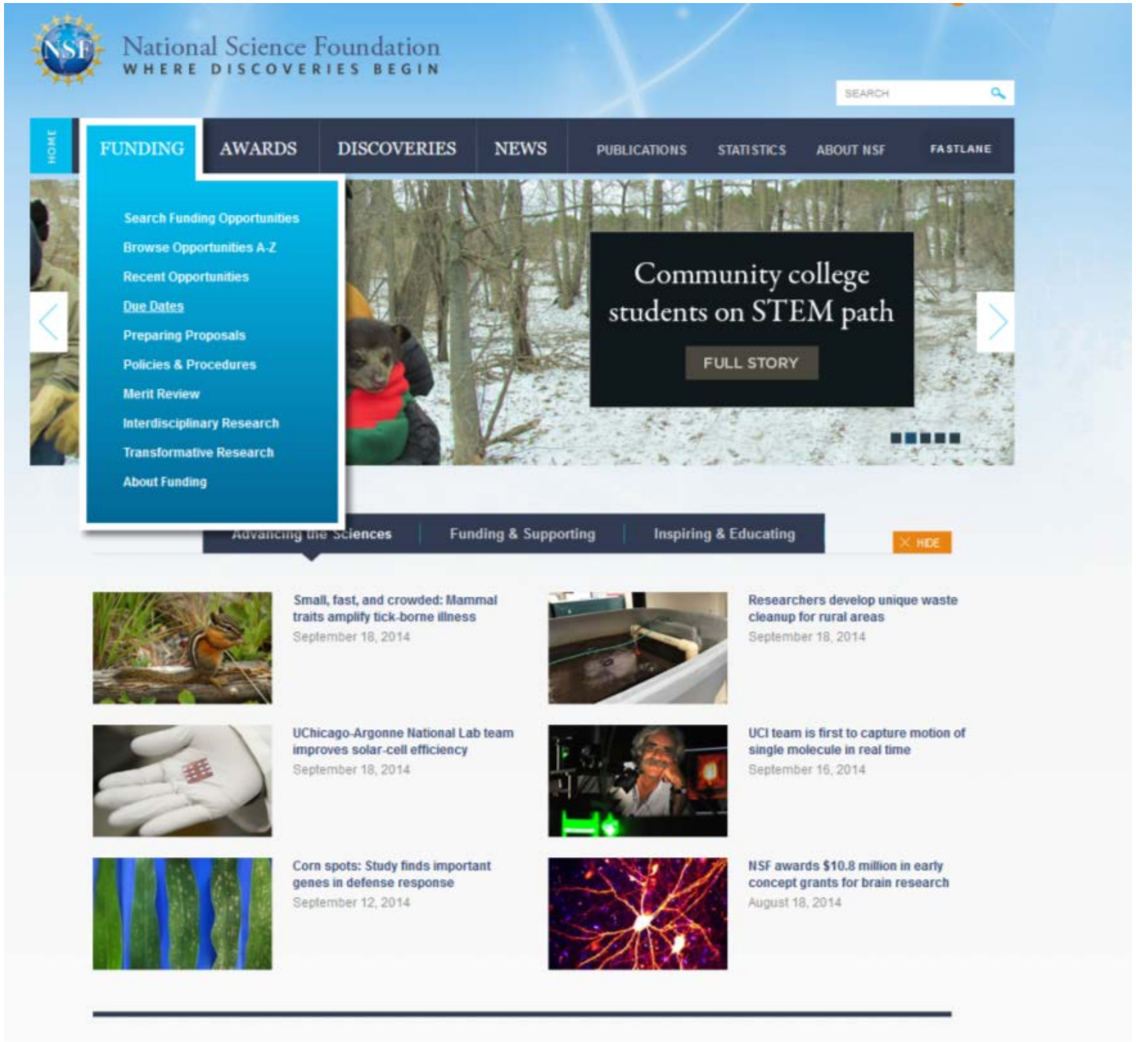
Respond to Solicitation

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.



www.nsf.gov

Respond to Solicitation

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

- Browse Funding Opportunities A-Z
- Due Dates
- Find Funding
- Merit Review
- Policies and Procedures
- Preparing Proposals
- Recent Opportunities
- Transformative Research

Joint NSF/NIH Initiative on Quantitative Approaches to Biomedical Big Data (QuBBD)

CONTACTS

Name	Email	Phone	Room
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Lora Billings	lbilling@nsf.gov	(703) 292-8039	1025 N
Vinay Pai	BD2K_QuBBD@mail.nih.gov	(301) 451-4781	NIH

PROGRAM GUIDELINES

Solicitation 16-573

Important Information for Proposers

A revised version of the *NSF Proposal & Award Policies & Procedures Guide* (PAPPG) (NSF 16-1), is effective for proposals submitted, or due, on or after January 25, 2016. Please be advised that, depending on the specified due date, the guidelines contained in NSF 16-1 may apply to proposals submitted in response to this funding opportunity.

DUE DATES

Full Proposal Deadline Date: September 28, 2016

Full Proposal Deadline Date: September 12, 2017

Second Tuesday in September, Annually Thereafter

SYNOPSIS

Recent advances in medical and healthcare technologies are creating a paradigm shift in how medical practitioners and biomedical researchers approach the diagnosis, prevention, and treatment of diseases. New imaging technologies, advances in genetic testing, and innovations in wearable and/or ambient sensors are allowing researchers to predict health outcomes and develop personalized treatments or interventions.

Coupled with the rapid growth in computing and infrastructure, researchers now have the ability to collect, store, and analyze vast amounts of health- and disease-related data from biological, biomedical, behavioral, social, environmental, and clinical studies. The explosion in the availability of biomedical big data from dispar... including images, networks, and graphs, pose significant challenges in term...

While there have been some encouraging developments related to foundati... approaches for big data challenges over the past decade, there have been ... challenges related to biomedical data science. The National Science Foun... (NIH) recognize that fundamental questions in basic, clinical, and translatio... multidisciplinary approaches that involve experts in quantitative disciplines ... science.

The Quantitative Approaches to Biomedical Big Data Program is designed t... application areas at the intersection of the biomedical and data sciences by... collaborations that focus on innovative and transformative approaches to ad...

REVISIONS AND UPDATES

THIS PROGRAM IS PART OF

What Has Been Funded (Recent Awards Made Through This Program, with Abstracts)

Map of Recent Awards Made Through This Program

THIS PROGRAM IS PART OF

What Has Been Funded (Recent Awards Made Through This Program, with Abstracts)

Map of Recent Awards Made Through This Program

Respond to Solicitation

Review related abstracts.

Export up to 3,000 Awards: CSV | XML | Excel | Text

Email this Link | Export All Results

Sort By: Relevance | Results size: 30 per page | Table | List

Page 1 of 5 | Displaying 1 - 30 of 131

CDS&E/Collaborative Research: The Integration of Data-Mining with Multiscale Engineering Computations
Award Number:1310173; Principal Investigator:Yannis Kevrekidis; Co-Principal Investigator:Amit Singer; Organization:Princeton University;NSF Organization:CMMI Start Date:08/15/2013; Award Amount:$525,000.00; Relevance:48.0;

CDS&E/Collaborative Research: The Integration of Data-Mining with Multiscale Engineering Computations
Award Number:1309858; Principal Investigator:Ronald Coifman; Co-Principal Investigator:Ronen Talmon; Organization:Yale University;NSF Organization:CMMI Start Date:08/15/2013; Award Amount:$475,000.00; Relevance:48.0;

Complexity to Clarity: Nonparametric Procedures that Exploit Structured Data and Models
Award Number:1521786; Principal Investigator:Ann Lee; Co-Principal Investigator:Shirley Ho, Chad Schafer; Organization:Carnegie-Mellon University;NSF Organization:DMS Start Date:09/01/2015; Award Amount:$400,000.00; Relevance:48.0;

High-Performance, High-Level Tools for Statistical Inference and Unsupervised Learning
Award Number:1622501; Principal Investigator:John Owens; Co-Principal Investigator:John Fisher, Alan Edelman, Jeff Bezanson; Organization:University of California-Davis;NSF Organization:DMS Start Date:09/15/2016; Award Amount:$164,612.00; Relevance:48.0;

Collaborative Research: Towards an Accurate, High-Fidelity Modeling System for Multiphysics and Multiscale Coastal Ocean Flows
Award Number:1622459; Principal Investigator:Hansong Tang; Co-Principal Investigator:; Organization:CUNY City College;NSF Organization:DMS Start Date:09/15/2016; Award Amount:$100,000.00; Relevance:48.0;

"Big-Data" Asymptotics: Theory and Large-Scale Experiments
Award Number:1418362; Principal Investigator:David Donoho; Co-Principal Investigator:Iain Johnstone; Organization:Stanford University;NSF Organization:DMS Start Date:08/15/2014; Award Amount:$700,594.00; Relevance:48.0;

Expanding the Computational Statistics Toolbox for General Hierarchical Models
Award Number:1622444; Principal Investigator:Perry de Valpine; Co-Principal Investigator:Duncan Temple Lang, Abel Rodriguez, Christopher Paciorek; Organization:University of California-Berkeley;NSF Organization:DMS Start Date:09/15/2016; Award Amount:$199,920.00; Relevance:48.0;

Statistical Analysis for Partially-Observed Markov Processes with Marked Point Process Observations
Award Number:1228244; Principal Investigator:Yong Zeng; Co-Principal Investigator:; Organization:University of Missouri-Kansas City;NSF Organization:DMS Start Date:09/01/2012; Award Amount:$278,533.00; Relevance:48.0;

Collaborative Research: Scalable Statistical Validation and Uncertainty Quantification for Large Spatio-Temporal Datasets
Award Number:1417857; Principal Investigator:Douglas Nychka; Co-Principal Investigator:Douglas Nychka; Organization:University Corporation For Atmospheric Res;NSF Organization:DMS Start Date:08/01/2014; Award Amount:$75,090.00; Relevance:48.0;

Nonparametric Network Comparison

Respond to Solicitation

Review related abstracts.

Search Awards

Recent Awards

Presidential and Honorary Awards

About Awards

How to Manage Your Award

Grant Policy Manual

Grant General Conditions

Cooperative Agreement Conditions

Special Conditions

Federal Demonstration Partnership

Policy Office Website

Award Abstract #1622501

High-Performance, High-Level Tools for Statistical Inference and Unsupervised Learning

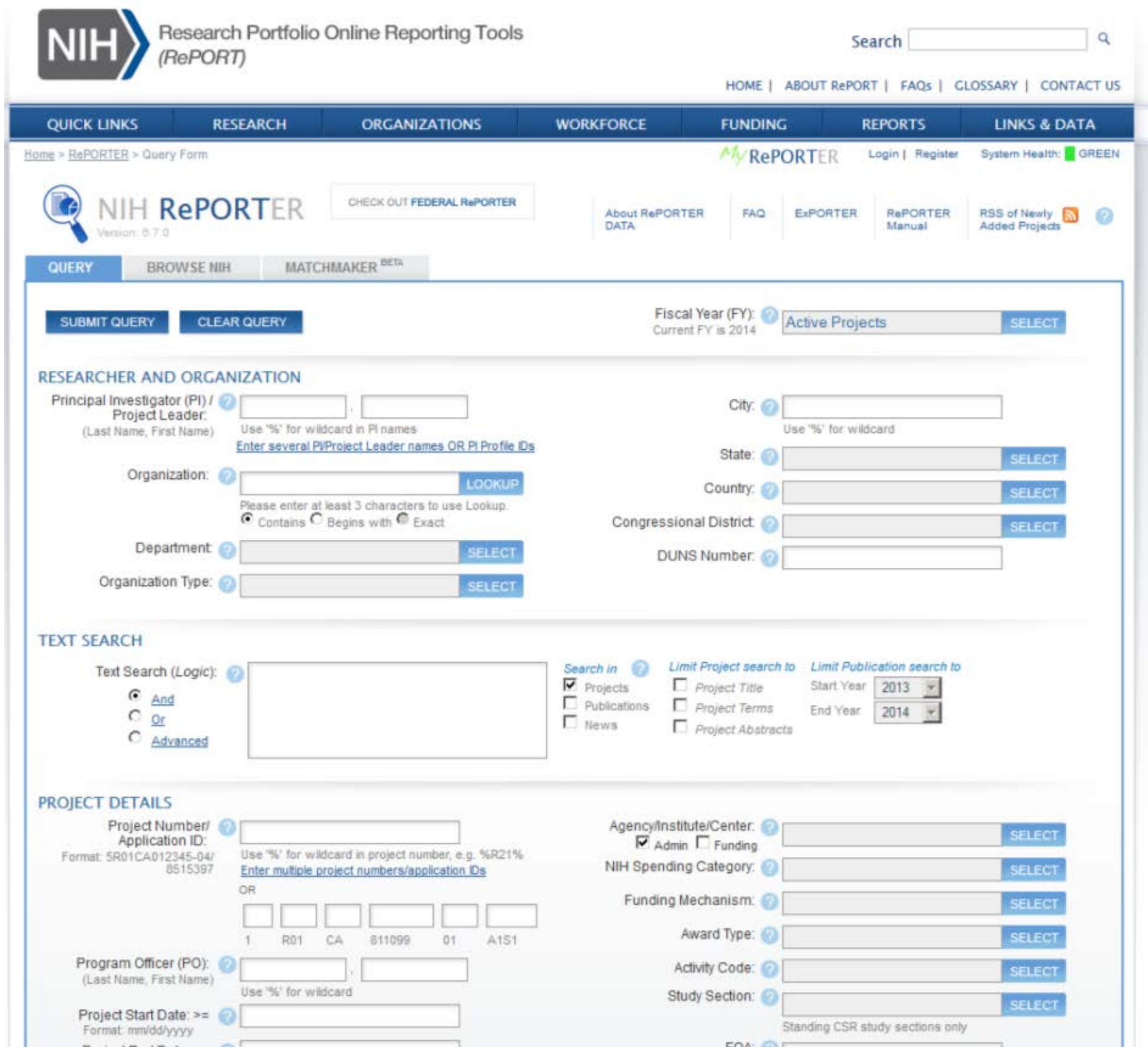
NSF Org:	DMS Division Of Mathematical Sciences
Initial Amendment Date:	September 13, 2016
Latest Amendment Date:	September 13, 2016
Award Number:	1622501
Award Instrument:	Continuing grant
Program Manager:	Yong Zeng DMS Division Of Mathematical Sciences MPS Direct For Mathematical & Physical Scien
Start Date:	September 15, 2016
End Date:	August 31, 2019 (Estimated)
Awarded Amount to Date:	$164,612.00
Investigator(s):	John Owens jowens@ece.ucdavis.edu (Principal Investigator) John Fisher (Co-Principal Investigator) Alan Edelman (Co-Principal Investigator) Jeff Bezanson (Co-Principal Investigator)
Sponsor:	University of California-Davis OR/Sponsored Programs Davis, CA 95618-6134 (530)754-7700
NSF Program(s):	CDS&E-MSS, CDS&E
Program Reference Code(s):	7433, 8083, 8084, 9263
Program Element Code(s):	8069, 8084

ABSTRACT

Using the "Julia" language for scientific computing developed at MIT, the UC Davis, MIT, and Julia Computing, Inc. teams funded by this project will extend the Julia language and runtime to utilize massively-parallel graphics processing units (GPUs) as first-class processors for scientific computing. Julia offers the twin advantages of straightforward, high-level programmability as well as excellent performance; adding GPU capability within Julia opens the door to even greater performance. The team will use Julia and its new

Respond to Solicitation

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



Respond to Solicitation

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

NIH Research Portfolio Online Reporting Tools (RePORT)

Search

HOME | ABOUT RePORT | FAQs | GLOSSARY | CONTACT US

QUICK LINKS | RESEARCH | ORGANIZATIONS | WORKFORCE | FUNDING | REPORTS | LINKS & DATA

Home > RePORTER > Search Results

MyRePORTER Login | Register System Health: GREEN

Search Results

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There were **4946** 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 ... 196 197 198 Page 1 of 198 Next Last

T: Application Type; Act: Activity Code; Project: Admin IC,Serial No.; Year: Support Year/Supplement/Amendment

T	Act	Project	Year	Sub #	Project Title	Contact PI/ Project Leader	Organization	FY	Admin IC	Funding IC	FY Total Cost by IC	Similar Projects
4	R01	DK089201	05		CONSERVED FETAL EPIGENOMIC SIGNATURES IN A PRIMATE MODEL OF MATERNAL OBESITY	AAGAARD, KJERSTI MARIE	BAYLOR COLLEGE OF MEDICINE	2016	NIDDK	NIDDK	$287,212	
1	F31	DK111186	01		OBESITY AND DIABETES AS MEDIATORS OF BENIGN PROSTATIC HYPERPLASIA	AARON, LATAYIA	MEHARRY MEDICAL COLLEGE	2016	NIDDK	NIDDK	$40,417	
4	P20	GM103527	09	5042	ROLE OF BIOACTIVE LIPIDS IN THE PROTECTIVE PATHWAYS OF OBESITY IN ISCHEMIC CARDI	ABDEL-LATIF, AHMED	UNIVERSITY OF KENTUCKY	2016	NIGMS		$255,850	
4	UH3	TR000928	04		TARGETING TUMOR-DERIVED EXRNA-CONTAINING MICROVESICLES BY HIGH THROUGHPUT SCREENI	ABDEL-MAGEED, ASIM B	TULANE UNIVERSITY OF LOUISIANA	2016	NCATS	OD	$999,920	
4	R01	HL117626	04		STUDIES OF RARE GENETIC VARIATION IN THE ISOLATED POPULATION OF SARDINIA	ABECASIS, GONCALO	UNIVERSITY OF MICHIGAN	2016	NHLBI	NHLBI	$711,517	
7	R01	HL108379	04		INSULIN RESISTANCE AND MYOCARDIAL AUTOPHAGY	ABEL, E DALE	UNIVERSITY OF IOWA	2014	NHLBI	NHLBI	$369,950	
5	R01	HL112413	02		CARDIAC DYSFUNCTION IN THE MET SYNDROME: CROSS-TALK BETWEEN IR AND BAR SIGNALING	ABEL, E DALE **et al.**	UNIVERSITY OF IOWA	2016	NHLBI	NHLBI	$386,250	
5	R01	HL127764	02		INSULIN INHIBITION OF BETA-AR SIGNALING IN THE MYOCARDIUM	ABEL, E DALE **et al.**	UNIVERSITY OF IOWA	2016	NHLBI	NHLBI	$594,618	

Respond to Solicitation

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

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Project Information

4R01DK089201-05

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Project 1 of 4946 NEXT

DESCRIPTION | DETAILS | RESULTS | HISTORY | SUBPROJECTS | SIMILAR PROJECTS | NEARBY PROJECTS BETA | LINKS | NEWS AND MORE

Project Number: 4R01DK089201-05 **Former Number:** 5R01DK089201-05

Title: CONSERVED FETAL EPIGENOMIC SIGNATURES IN A PRIMATE MODEL OF MATERNAL **OBESITY**

Contact PI / Project Leader: AAGAARD, KJERSTI MARIE

Awardee Organization: BAYLOR COLLEGE OF MEDICINE

Abstract Text:

DESCRIPTION (provided by applicant): According to the Developmental Origins of Adult Disease Hypothesis, perturbations in the gestational orearly postnatal environment influence the development of adult diseases. Data from our laboratory and others collectively suggest that this occurs with reprogramming of gene expression via epigenetic changes to the 'histone code'. What constitutes the 'histone code'? While almost all cells of an individual bear near identical genomic constitutions, phenotype is ultimately determined by the gene expression profile. Gene expression is maintained by two major mechanisms: (1) transcription factors and post-transcriptional modifiers, and (2) epigenetic modifications, in particular DNA methylation and core-histone modifications. Research is rapidly demonstrating the importance of the epigenetic code to normal human development as well as the burden of disease that occurs when the epigenetic code or machinery malfunctions. However, it remains a fundamental question in the field of epigenomics research if and how the fetal epigenome varies in response to maternal phenotype and diet modifications, and if it is truly predictive of later in life disease states (suh as **obesity** and diabetes). Our lab is dedicated to studying the effects of the in utero milieu on epigenetic changes in the fetus. We have developed a non-human primate model of **obesity**, now in its ninth year, to study the fetal histone code. We have shown that it is maternal high fat diet consumption (rather than maternal **obesity** per se) which results in abnormal development of both the hypothalamic neurocircuitry and peripheral entrainment integral to regulation of fetal glucose and lipid homeostasis; these alterations are accompanied by epigenetic changes in chromatin structure resulting in reprogramming of fetal gene expression. As a result of this work, we are now uniquely poised to apply concomitantly developed high throughput sequencing technologies with advanced analytical approaches to decipher the molecular means by which the primate epigenome is modified. In this proposal we present our application of these technologies (ChIP-Seq, RNA-Seq, and custom CpG arrays) in our genome wide characterization of the fetal primate hepatic epigenome. Our studies are relevant to public health since they will clarify how the maternal diet influences the developing primate infant, and whether these changes increase the risk of later in life **obesity**.

Public Health Relevance Statement:

Given the growing body of evidence that many (if not the vast majority) of chronic, non-communicable disease have their origins in fetal life, understanding the in utero factors that impact fetal metabolism and development are among the most important public health issues of our time. Our lab is dedicated to studying the effects of the in utero miliu on epigenetic changes in the fetus. We have developed a non-human primate model of **obesity**, now in its ninth year, to study the fetal histone code. We have shown that it is maternal high fat diet consumption (rather than maternal **obesity** per se) which results in abnormal development of both the hypothalamic neurocircuitry and peripheral

Proposal Preparation Process

Always outline!

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										
Problem Overview • *What is the problem* • *What has already been done to address problem* • *What gaps remain* • *How we propose to address gaps*										
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 1st draft										
Project team 1st edit										
Any outside review input/edit										
Editing iterations										
Check proposal worksheet to verify for DLRC, DP, or other DP center credit										
Write summary or abstract										

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

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 HUBzero 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?

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Project Timetable

- Need Gantt-style chart such as this.
- Overview sentence

Program Initiatives	Year one	Year Two	Year Three	Year Four	Year Five
CICAWEST Administration					
Advisory Board Meeting					
D&I Team and COD meeting					
Mentoring Academy					
Training of coaches/chairs					
Mentoring pairs					
Departmental Transformation					
Diversity Forums					
Chairs/Dept Heads @ PU					
All Three Institutions					
Transformational Team Visits					
NCWIT Visiting Committees					
Promotion and Tenure Review					
Building Networks					
Summit					
Invited Lectures					
Evaluation and Assessment					
STEM Climate Assessment					
Space/Resource Inventory					
Coaching Measures					
Mentor/Mentee percp/self-eff/prod					
Attitudinal Surveys					
Deans and Heads					
Faculty					
Network Analysis					
External Project Analysis					
Dissemination					
Website					
CIC *Women in Academia*					
Summit Attendees Mailings					
Publications					
National Presentations					

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

Key Strategies

Addressing common trouble spots

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

Key Strategies

Addressing common trouble spots

- tell a compellin
- respond to soli
- answer “Why P
- know your reviewer
- conduct internal review

- writing for expert and non-expert
- busy, rushed
- did not choose to read your proposal

Know Your Reviewer

The secret to editing your work is simple: you need to become its reader instead of its writer.

—Anna Deavere Smith

Know Your Reviewer

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

- use formatting as a roadmap
- be generous with white space
- be clear and concise
- proof proposal

Know Your Reviewer

Parallel formatting provides a roadmap to help your reviewer

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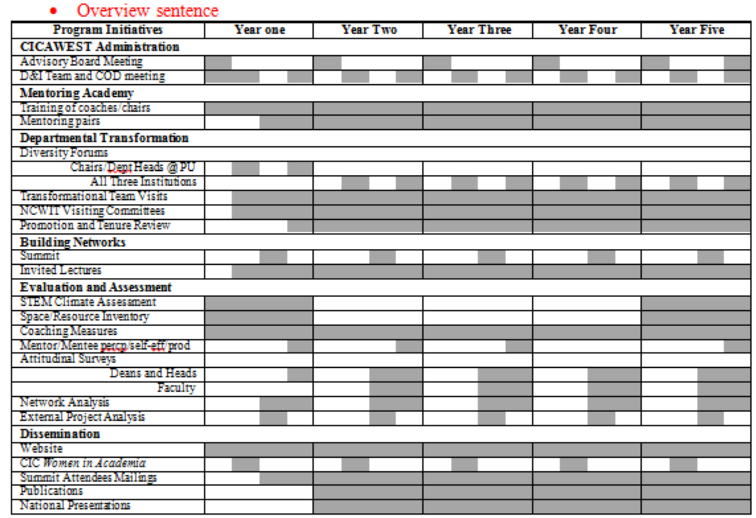

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Know Your Reviewer

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, Katmandu, 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

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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

Avoid long, dense sentences.

There are several innovations of this proposed research, including: a) analysis of air contaminant mixtures and health, particularly with extremely high spatiotemporal resolution; b) consideration of climate change impacts; and c) incorporation of novel risk assessment methodology. (37 words)

Our key innovations include: a) analyzing air contaminant mixtures and health with extremely high spatiotemporal resolution; b) considering climate change impacts; and c) incorporating novel risk assessment methodology.
(28 words)

Know Your Reviewer

Get rid of passive voice

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

We investigated elemental mapping of animal tissues and documented results.

Know Your Reviewer

Get rid of passive voice

More detailed evaluations of different policy scenarios will also be developed with input from key decision makers and local communities in each state.

We will also develop more detailed evaluations of different policy scenarios with input from key decision makers and local communities in each state.

Know Your Reviewer

Delete words that do not add anything

The development of a process to screen new high-throughput products for further evaluation is certainly one of the most important features.

Know Your Reviewer

Remove ambiguity particularly with reference words.

When Nature published research that explored gene editing of embryos using CRISPR–Cas9 to correct a specific genetic mutation, it did not include embryos from IVF clinics.

What is “it”? The paper? The research? The gene editing? CRISPR-Cas9?

Know Your Reviewer

Delete words that do not add anything

- The fund provides a match to outside investor funding for critical capital.

Know Your Reviewer

Delete words that do not add anything

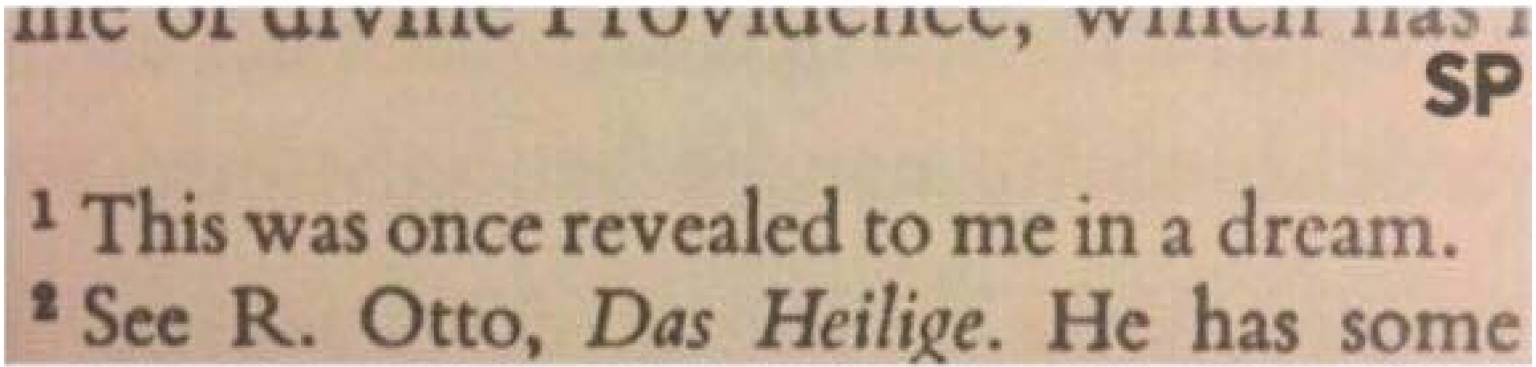
- The fund provides a match to outside investor funding for critical capital.
- The fund matches outside investor funding for critical capital.

Know Your Reviewer

Sloppy writing = sloppy science

Know Your Reviewer

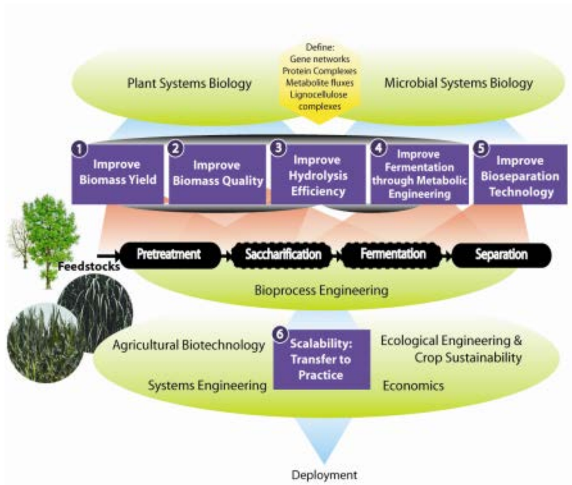
Be particular....even check that references are compliant

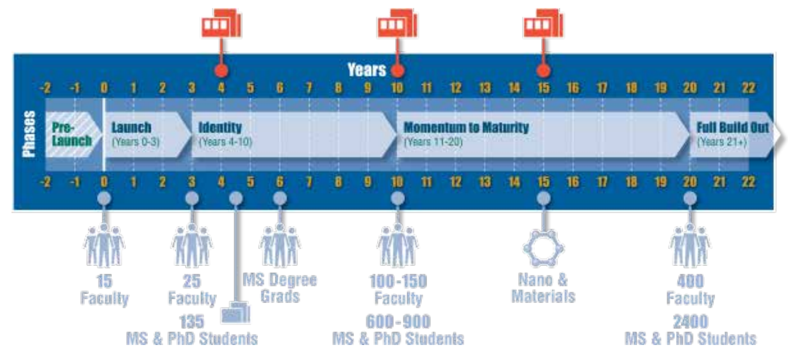

SP

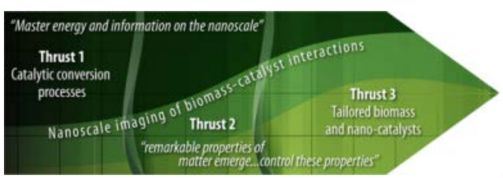
[1] This was once revealed to me in a dream.
[2] See R. Otto, *Das Heilige*. He has some

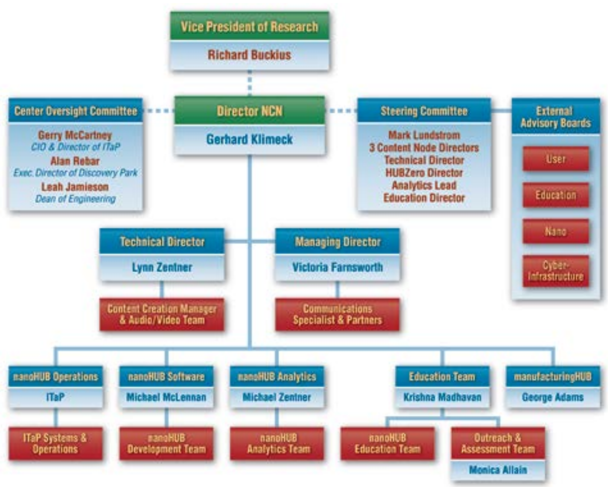
Know Your Reviewer

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 "W
- know you
- conduct internal review

- planned from beginning
- formal or informal

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 • *What is the problem* • *What has already been done to address problem* • *What gaps remain* • *How we propose to address gaps*	■	■	■							
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 1st draft						■				
Project team 1st 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