

## **Request for Proposals: UNC Research Opportunities Initiative (ROI)**

### **Introduction**

The UNC Research Opportunities Initiative (ROI; [roi.northcarolina.edu](http://roi.northcarolina.edu)) provides targeted funding for innovative and potentially game-changing research projects. Funded by a recurring annual appropriation from the North Carolina General Assembly, the ROI represents a significant financial investment in the UNC system's strategic goals.

Priority research areas eligible for ROI funding include advanced manufacturing; marine and coastal science; defense, military, and security; pharmacoengineering; energy; and data science. ROI awards demonstrate North Carolina's growing appreciation of the role that university research can play in supporting economic development across our state.

The ROI accepts pre-proposals from any institution (or collection of institutions) in the 17-campus UNC system. Invited full proposals will be reviewed externally through a process refereed by the American Association for the Advancement of Science (AAAS).

### **Priority Areas for Funding**

UNC is home to world-class researchers across many fields. The University has the potential to benefit the state of North Carolina by working in partnership with each other and with businesses, foundations, nonprofits, and others. The research areas identified as strategically important for North Carolina as outlined in the UNC Strategic Plan are the following:

#### **Advanced manufacturing**

Advanced manufacturing integrates information technology, design methodology, rapid prototyping, automation, computation, software, sensing, networking, and new materials in the production of products as well as the systems that support and enable them. Examples include robotics and other automation; additive and traditional machining; computation; and visualization equipment.

Advanced Manufacturing approaches and techniques can apply to cutting-edge technical fields such as aerospace, nanotechnology, and biopharmaceuticals as well as to traditional industries such as furniture, textiles and motor vehicles, all of which are part of the North Carolina manufacturing economy.

#### **Coastal and marine science**

North Carolina has hundreds of miles of ocean beaches, thousands of miles of estuarine coastline, and millions of acres of sounds, creeks, and marshes. As such, coastal and marine-related activities are important to the State's economy, both in traditional sectors (e.g., tourism, fisheries, hazard resilience, and marine heritage), and in emerging areas (e.g., ocean energy and marine biotechnology).

UNC System researchers are leaders in areas such as coastal hazards modeling and protection, marine biotechnology, seafood technology, ocean energy, and others. It is incumbent on UNC institutions to be at the forefront of coastal and marine science research.

### **Data science**

The volume of data available for making decisions has increased dramatically in the recent past, creating a corresponding need to make sense of and take advantage of that vast data to inform decision-making in fields including scientific research, homeland security, defense, energy management, and many more.

Nearly every sector of the U.S. economy struggles with growing data volumes, resulting in “big data” becoming an increasingly important research field. The data management and data analytics sectors are worth \$125 billion and are growing rapidly. Other big data markets include health care genomics, the financial sector, emergency management, climate, and agribusiness. UNC has strengths in big data that, if collectively harnessed, can provide national leadership in this important sector.

### **Defense, military, and security**

North Carolina has a robust and growing military community, with the third-largest military population in the United States distributed among six military installations. North Carolina also is home to more than half of all U.S. Special Operations Forces, including three of the five subordinate commands of the U.S. Special Operations Command.

UNC has distinct talents and cutting-edge technology that can be coupled with our strong relationships with these operational end users. These relationships, along with having the U.S. Army Research Office located in Research Triangle Park, offer a distinct advantage: face-to-face interactions with military customers, combat developers, and program managers to help us better understand DOD and Homeland Security research & development needs, programs, and processes.

### **Energy**

Energy touches the lives of every North Carolinian every day. Critical activities ranging from transportation to operation of factories and offices to heating and cooling our homes hinge on our ability to produce and consume energy. Recognizing that most sources of easily accessible energy are limited and many are non-renewable, UNC must be at the forefront in making discoveries that will fuel our state and the world in the future.

ROI investments will take advantage of the wide array of energy research, development, outreach, and training provided by these and other programs, in collaboration with both private and nonprofit organizations and will yield scientific advances in the field and economic advances for the state.

### **Pharmacoengineering**

Pharmacoengineering is the science behind the development of materials and technologies to improve the delivery of therapeutic and diagnostic agents. Advances in this field can lead to new generations of drugs, drug delivery systems, and novel means to assess drug safety and efficacy through imaging and biosensing.

Targeted investment in pharmacoengineering within the UNC system will build on the success of medicine and life sciences at UNC-Chapel Hill and engineering at NC State and leverage the success of the existing joint Department of Biomedical Engineering between those institutions. The focus of this investment will be on building collaborations between UNC-Chapel Hill’s Schools of Medicine, Pharmacy, and College of Arts and Sciences, and NC State’s Colleges of Engineering, Agriculture and Life Sciences, Science, and Veterinary Medicine, as well as other UNC institutions, private companies, and nonprofits.

### **Award Focus and Scope**

UNC ROI awards are designed to build capacity in research areas that are strategically important to North Carolina. The intent of this funding is not to establish a research program *de novo*; rather it is to provide the needed boost to propel a team to national or international prominence. Successful proposals will fully describe how the research aligns with the ROI priority areas described above and will outline how the work will have positive short-term and long-term effects on the State. Proposals that demonstrate strong commercialization potential and collaboration with other universities and with the private and not-for-profit sectors will be viewed favorably.

Proposers should describe how this ROI funding would make them more competitive for follow-on funding from various funding sources. Facilities and Administrative (F&A) costs are not allowed. Investigators who have submitted proposals in previous rounds may submit *new* proposals in response to this call that offer a significantly new direction from the previous ROI-funded research.

This year two types of proposals will be considered: Planning Grants and Research Grants. ROI Planning Grants will provide a maximum of \$50,000 for 6 to 12 months. ROI Research Grant proposers may request from one to three years of funding at a maximum of \$600,000/year.

We encourage proposers to carefully consider an appropriate scope for their project given the amount of available yearly funds and goals for the project. In the first round of ROI funding, proposals were most successful when they demonstrated how ROI funds would help to position teams for 1) short- and long-term impact on the state (e.g., recruiting top faculty, building specialized instrumentation or research expertise, setting up North Carolina as a hub within a given field), 2) success in obtaining follow-on funding from other agencies, 3) successfully commercializing technologies, and 4) enhancing collaboration with other institutions.

For examples of projects selected in the first round of ROI awards, please visit <http://roi.northcarolina.edu/awardees.html>.

### **Guidelines for Proposal Submission**

The ROI accepts pre-proposals from any institution in the 17-campus UNC system. Although inter-institutional collaboration is not a requirement, pre-proposals that significantly involve two or more UNC institutions are desirable. **The Chief Research Officer of the primary institution must provide a ranking of pre-proposals when submitting multiple pre-proposals for his/her institution. A maximum of six pre-proposals may be submitted per institution (three Planning Grant proposals and three Research Grant proposals). Pre-proposals will be accepted only from the Chief Research Officer.** The period of performance is six months to one year for a Planning Grant and from one to three years for a Research Grant. Funding may commence as early as August 1, 2016.

### **Pre-proposals**

Pre-proposals may be reviewed by colleagues both inside and outside of the specific discipline(s); therefore, pre-proposals should use language that can be understood by those lacking expertise in the specific research area(s). Pre-proposals must be submitted electronically as a single PDF **by April 19, 2016.**

You may also access the application form at the ROI website:

<http://roi.northcarolina.edu/info.html>

While more than one institution may be involved, a single institution must be identified as the primary (lead) institution. Please name your file as follows:

Institution\_Lead PI Name\_RG

(RG = Research Grant; use PG for Planning Grant).

**Examples:**

Dr. Jones from East Carolina University submits a planning grant. The pdf should be named ECU\_Jones\_PG

Professor Smith from UNC Wilmington submits a research grant. The pdf should be named UNCW\_Smith\_RG

The pre-proposal must contain the following (12 point font):

- Front matter (1 page) including the title of the project, the type of grant application (Planning Grant or Research Grant), a list of 5 key words, principal investigator contact information, other key personnel and their campus affiliation, a 100-word synopsis of the proposed project, total amount requested, and duration of project (including a beginning and end date).
- Project description (2 pages for a Research Grant, 1 page for a Planning Grant) that specifically addresses how the proposed activities align with the goals of this RFP (see Proposal Review and Evaluation section). The description should include sufficient detail that reviewers can evaluate the goals and scientific approach of your planned proposal. The project description must include a list of key personnel with titles and departments.
- Preliminary combined budget and justification, including a brief timeline for usage of funds (1 page). Facilities and Administrative costs (F&A; also known as indirect costs or overhead) is not allowed. Cost-matching is not required, but if it is part of the proposed budget it must be included in this document.

Pre-proposals and invited proposals will undergo review based on the criteria outlined in the Proposal Review and Evaluation section.

**Proposals**

Invited proposals must be submitted electronically **by May 26, 2016**. Investigators who are invited to submit a full proposal will be provided with instructions on how to apply online. While more than one institution may be involved, a single institution must be identified as the primary institution. The Chief Research Officer of the primary institution (home campus of the principal investigator) must be the submitter; proposals from other individuals will not be accepted.

Proposals must contain the following (12 point font):

- Front matter (1 page) including the title of the project, the type of grant application (Planning Grant or Research Grant), a list of 5 key words, principal investigator contact information, other key personnel and their campus affiliations, synopsis of the proposed project appropriate for general

readership (200 words for a Research Grant, 100 words for a Planning Grant), total amount requested, and duration of project (including a beginning and ending date).

- Project description (10 pages max for Research Grant; 5 pages max for Planning Grant) that specifically addresses how the proposed activities align with the goals of this RFP (see Proposal Review and Evaluation section). The description should include sufficient detail that reviewers can evaluate the appropriateness and feasibility of the proposed plans. This section must outline a clear set of goals that are aspirational yet attainable, an outline of the plan of work with milestones and a timeline, and a clear set of metrics. Research Grants must also include a plan for sustainability. (A sustainability plan is not required for Planning Grants.)
- A management plan (1 page for Research Grants and Planning Grants) is required. This section should describe the roles of the various team members and the plans for how the team will function as a unit. If applicable, provide evidence for prior partnership.
- A single budget and justification, including projected expenditures by quarter (no page limit). Cost-matching is not required, but if it is part of the proposed budget it must be included in this section. Facilities and administrative costs (F&A; also known as indirect costs or overhead) is not allowed. Budget must adhere to the ROI budget template, which is posted on the ROI website (<http://roi.northcarolina.edu/info.html>). Proposers selected for funding will be required to submit an Excel version (rather than pdf) of the final budget document.
- One- to two-page biosketches of the principal investigator and all key personnel. There is no limit on the number of biosketches.
- Letters of support are not required, but are allowed. There is no restriction on the number of support letters that may be submitted.

While not a requirement, proposals that significantly involve two or more UNC institutions are desirable. The American Association for the Advancement of Science (AAAS) will manage the review of the invited full proposals. Each proposal will be assigned to three highly qualified third party reviewers from outside the state of North Carolina, selected for their expertise in the particular technical area(s) of the proposal. A full list of review criteria is provided in the Proposal Review and Evaluation section.

The period of performance for Research Grants may range from one to three years. The period of performance for Planning Grants may range from 6 to 12 months. Funding may commence as early as August 1, 2016. Annual reports on the activities and progress will be due at the end of each fiscal year, and additional interim reports will be requested on an as-needed basis. Awardees will be expected to respond to occasional ad hoc requests for information as needed.

### **Timeline**

March 28, 2016: Solicitation release  
April 5, 2016 at 10:00 am: Q&A teleconference call (919-962-2720; no access code needed)  
April 19, 2016: Pre-proposals due  
April 26, 2016: Pre-proposal decision  
May 26, 2016: Proposals due  
August 1, 2016: Earliest funding start

In this funding cycle, two types of proposals will be considered: Planning Grants (limit of \$50,000 for six months to one year) and Research Grants (limit of \$600,000 per year for one to three years).

### **Proposal Review and Evaluation**

A panel of UNC GA staff will invite proposals from a subset of the submitted pre-proposals. Invited proposals will be evaluated through an external review process managed by AAAS. The AAAS scoring is as follows:

- Excellent (very impressive proposal; deserves high priority)
- Very Good (high quality proposal; no serious concerns)
- Good (average proposal; some doubts or concerns)
- Fair (some deficiencies; needs improvement to meet the objectives of the UNC ROI)
- Poor (serious concerns or some conceptual flaws)

Criteria for pre-proposal and proposal evaluation are described below.

#### **1) ROI Planning Grants**

**ROI Planning Grants will be awarded to provide support to organize and develop the initial stages of a collaborative research program.** Proposals will be reviewed according to the criteria listed below, but special consideration will be given to proposals that have the potential to make North Carolina more competitive for large-scale grants such as NSF Science and Technology Center (STC), NSF Engineering Research Center (ERC), NSF Materials Research Science Engineering Center (MRSEC), DOD Multidisciplinary University Research Initiative (MURI) grants, or others. Planning Grant awardees are eligible for future ROI Research Grants. Applicants are encouraged to mention any grants that they plan to pursue at the end of their proposed ROI funding period.

Planning grants are not meant to cover research activities or equipment costs. For pilot or feasibility studies, applicants should apply for an ROI Research Grant. Proposed activities for a planning grant may include, but are not limited to the following:

- Establishing a research team
- Planning a new center or complex collaborative project
- Developing tools for data management or experimental design
- Support for release time, travel, workshops, and other expenses associated with conceptualization and preparation of large grants
- Travel to establish partnerships and to interact with federal and industry program officers
- Developing workshops, conferences, seminar series, or other professional activities related to the project
- Identification and recruitment of partners (industrial, academic or government)
- Concept development and white papers for large scale efforts
- Creation and support of resources such as websites, research collaboration sites, or other social networking tools to facilitate large scale research projects
- Other activities that will make the team more competitive for follow-on funding

ROI Planning Grants will provide a maximum of \$50,000 for six months to one year. At the end of the award, recipients of an ROI Planning Grant will be expected to deliver a report that outlines the outcomes of the work and defines next steps in the collaborative project.

Planning Grant evaluation criteria are as follows:

- Intellectual merit of the proposed collaborative research project
  - Importance of the planned project to advancing knowledge or understanding in its own field or in other fields. At this early stage, research ideas that are untested or unconventional are expected.
  - Originality of the planned project. Does the project have the potential to change a paradigm in your field or open up new and unexpected channels of collaboration?
  - Qualifications of the principal investigator and team to carry out the planning and the ultimate project, including strength of the Management Plan.
- “Game-changing” nature of the planned collaborative project
  - The possibility that the planned project will lead to major research opportunities that can be supported by federal agencies, industry, or non-profits. Special consideration will be given to proposals that position NC to be competitive for large-scale federal funding such as STC or MRSEC grants.
  - The degree to which the planned project builds on existing strengths.
  - The future potential for significant commercialization via patents, licensing, spin-offs, and/or investment from the private sector. We do not expect significant commercialization activities to take place during the planned funding period but would like to see this grant set the team up for future commercialization activities.
  - Potential for short-term (~1 year) and long-term impact on North Carolina if the team concludes that their collaboration will continue after the planned funding period.
- Project fit and feasibility
  - How well the planned project advances the UNC strategic plan (to be determined by a panel at UNC GA)
  - Clear targeting of one or more of the six priority areas
  - Clear description and feasibility of the milestones, metrics and anticipated planned project deliverables
  - Reasonableness of the budget

## 2) ROI Research Grants

**ROI Research Grants are awards to support research projects.** Investigators who intend to create a new center or research consortium are encouraged to apply for a Planning Grant if the team is just beginning to form. Centers and consortia will be considered as candidates for Research Grants, but any research projects subject to ROI funding must be specifically described in the proposal (i.e., proposals that request funds to be distributed to unnamed investigators/projects will not be considered). Proposals may request from one to three years of funding at a maximum of \$600,000/year.

Proposed activities may include, but are not limited to the following:

- Shared equipment, core facilities, and lease/upfit of research space (labs, shops, studios). (Funds are not to be used for capital expenditures.)
- Student (graduate and undergraduate) and postdoctoral support



- Support for faculty (e.g., startup packages or release time; ROI funds cannot be used to support faculty beyond the defined funding period)
- Workshops/conferences on emerging multidisciplinary research areas or seminar series to promote networking for innovative project formation
- Pilot or feasibility studies; proof-of concept funding for early data collection
- Travel
- Identification and recruitment of partners (industrial, academic, not-for-profit, or government)
- Creation and support of resources such as websites, research collaboration sites, or other social networking tools to facilitate large scale research projects

Evaluation criteria are as follows:

- Intellectual merit of the proposed activity
  - Importance of the project to advancing knowledge or understanding in its own field or in other fields
  - Originality of the proposed project. Does the project have the potential to change a paradigm in your field or open up new and unexpected channels of collaboration?
  - Qualifications of the principal investigator and team to carry out the project, including strength of the Management Plan.
- “Game-changing” nature of the proposed project
  - The possibility that the project will lead to major research opportunities that can be supported by federal agencies, industry, or non-profits. Special consideration will be given to proposals that position NC to be competitive for large-scale federal funding such as STC or MRSEC grants.
  - The degree to which the project builds on existing strengths
  - The opportunity for significant commercialization via patents, licensing, spin-offs, and/or investment from the private sector
  - Short-term (~1 year) and long-term impact on North Carolina
- Project fit and feasibility
  - How well the project advances the UNC strategic plan (to be determined by a panel at UNC GA)
  - Clear targeting of one or more of the six priority areas
  - Clear description and feasibility of the milestones, metrics and anticipated project deliverables
  - Reasonableness of the budget
  - Realistic nature of the long-term sustainability plan

### **Inquiries**

Questions regarding this solicitation may be directed to Dr. Erin Hopper or Dr. Christopher Brown:

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