

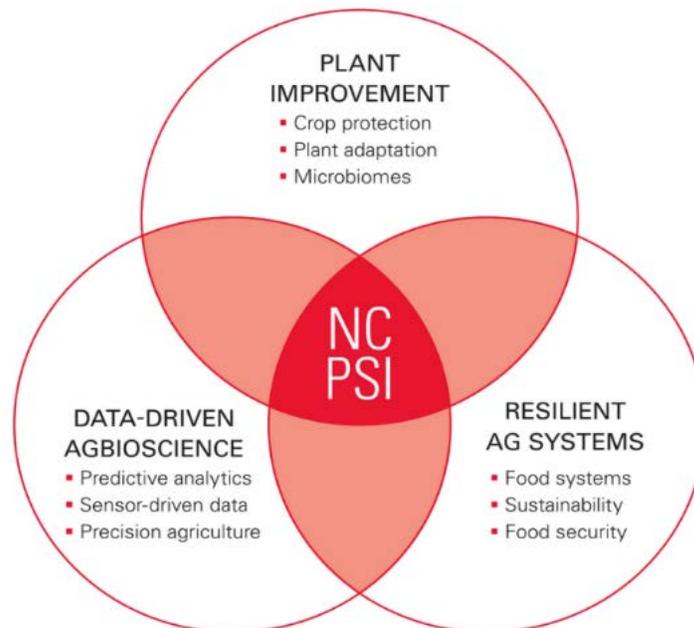
Game-Changing Research Incentive Program for Plant Sciences Initiative (GRIP4PSI)

Background: The NC Plant Sciences Initiative

A growing population. A reduction in farm acreage. Shifts in climates and water sources. The emergence of diseases, pests and herbicide-resistant weeds. Due to these and other grand challenges facing the global ecosystem today, significant increases in agricultural production are needed to feed, fuel and clothe the world in the coming decades. New varieties, methods, and technologies are needed across every sector of the agricultural industry, from food crops, to ornamentals and floriculture, turfgrass, forestlands and beyond. The NC Plant Science Initiative (PSI) was conceived by NC State and its partners to address these local and global challenges, and is envisioned to be a world-class transdisciplinary research initiative that will facilitate a convergence of research and development of innovative discovery tools across a wide spectrum of disciplines including plant sciences, engineering, economics, modeling and data analytics. It is the vision of the PSI that a productive and effective research and technology agenda will be the result of a portfolio of projects that are complex, highly integrated, driven by data and informatics, and that result in sustainable food and agricultural systems that are predictive and proactive.

A NC PSI Research and Technology Taskforce was created in 2016 to identify the core interdisciplinary research areas – called “research platforms.” The three research platforms are shown and described below:

NC PSI's research platforms...



Salient features of each research platform are described below. A comprehensive description of each platform may be found in the [Appendix](#) to this RFP. If you still have further questions, please contact the NC PSI launch director, Steve Briggs, at sbriggs@ncsu.edu.

1. Plant Improvement Platform

Crop Protection from Biotic and Abiotic Stress—In agriculture, biotic stress is stress to plants caused by pests (the collective term for microbes, weeds, insects, and other organisms that have a negative impact on plant health and yield). Abiotic stress is composed of plant stress due primarily to marginal growing conditions caused by weather events. This platform will focus on tools or production methods used to enhance plant growth due to biotic and/or abiotic stresses.

Agri-Symbiotics (plant symbiotic interactions with non-plant organisms)—This area focuses on advancing scientific understanding of the beneficial biological interactions between plants and other organisms (especially microbes, but also including fungi and invertebrates), and application of knowledge of such symbioses to technologies for advancing agricultural yield.

2. Data-Driven Agricultural Bioscience Platform

The Data-Driven Agricultural Bioscience Platform is the acquisition, processing, movement, and interpretation of data pertinent to crop production, from upstream basic research to downstream utilization by growers and consumers. It covers a systemic scale to include environmental, economic, phenotypic, molecular, and genetic data, spatial and predictive analytics, algorithmic development, computation, mobile geographic information systems (GIS), spatial data mining, and remote, sensor driven data.

3. Resilient Agricultural Systems Platform

The Resilient Agricultural Systems Platform will create a food system that reduces food insecurity, improve diet-related health outcomes and protect the environment for future generations while continuing to be profitable for our producers while answering societal questions about food and plant production.

For more information on the NC PSI, visit the following website (<https://cals.ncsu.edu/initiatives/plant-sciences-initiative/>) that provides history of the formation of the initiative and current news/programs.

Overview: The GRIP4PSI Large-Scale Seed-Funding Program

[The Game-Changing Research Incentive Program](#) (GRIP) was originally initiated in 2016 by the Office of Research and Innovation (ORI) to catalyze new, interdisciplinary research programs that are focused on societal grand challenges. With this RFP, ORI announces a new GRIP4PSI initiative to encourage the NC State community to collaborate on integrated research/outreach projects that are focused on one or more of the Research Platforms that comprise the NC PSI, that include:

- 1) Plant Improvement
- 2) Data-Driven Agricultural Bioscience
- 3) Resilient Agricultural Systems

The intention of this call for proposals is to attract a wide-breadth of disciplinary faculty to the field of plant sciences and catalyze the formation of effective and collaborative interdisciplinary teams that will challenge conventions, explore new ideas and open-up new avenues for sustainable research funding. ORI envisions that GRIP4PSI project teams will span multiple colleges at NC State, include external partners, develop from the full range of technical capabilities at NC State and beyond, and will boast world-class junior and senior faculty with clear potential for sustained success. Process learnings and research results from successful project teams should be game-changing for North Carolina's agricultural needs as well as national and global agricultural challenges.

The large-scale seed-funding of the GRIP4PSI initiative is provided to successful project teams with the expectation that their success will attract significant and sustained extramural follow-on research funding. Successful proposals will include:

- A clear and compelling statement of work that describes the novelty of the proposed work, and enumerates milestones to be accomplished and deliverables over the 3.5 years of funding (the first half year would be dedicated to planning, the latter three years for the research program).
- A rationale for the alignment of the proposed research program with one or more of the NC PSI Research Platforms (see above and refer to identified links for more details)
- Faculty teams that demonstrate strong collaboration potential, and, the integration of effective research programs. Outreach programs should also be developed for targeted stakeholders that would benefit from the proposed research (farmers, agribusiness companies, scientists, intellectual properties/technologists, start-ups, etc.)
- Evidence that the proposed research program addresses a research area for which there is compelling evidence of sustainable large-scale support (*e.g.*, Center-type grants, graduate and post-doctoral training grants, etc.) from government agencies, corporations, industrial consortia and/or foundations as well as a time-line for soliciting such support
- Letters of support from colleges and department heads, including agreements (if necessary) to provide release time, student support, supplies, travel funds and other financial resources to support the PI and other key faculty
- Letters of support from external partners, including financial support (if any) for the effort being proposed

Award Information

Funding for GRIP4PSI has been committed by ORI, the Provost's Office, the Kenan Institute for Engineering, Technology and Science, and the NC State Colleges of Agriculture and Life Sciences (CALs), Engineering (COE), Natural Resources (CNR), Sciences (COS), Management (PCOM), and Textiles (WCOT). This program is intended to seed, incentivize and amplify visionary research that will result in a high return on investment in terms of extramural funding, award-winning research impacts, and first-class interdisciplinary graduate education and training. **Proposals should focus on game-changing research ideas that are well-aligned with the NC PSI and go beyond traditional plant disciplinary sciences to break new ground.** Teams awarded GRIP4PSI funding will be considered, as a whole or in part, to be occupants of the new Plant Sciences Building to be constructed on Centennial Campus.

GRIP4PSI will provide up to \$650,000 over 3.5 years to up to three project teams (each team will receive \$50,000 for the first half-year for planning purposes, and \$200,000 per year for a 3-year period to complete research and outreach objectives). It is anticipated that one award will be made for each of the three PSI research platforms. After 1.5 years of funding, further funding will be contingent upon demonstration of satisfactory progress.

The primary focus of GRIP4PSI funds should be to support the efforts of interdisciplinary graduate student teams, post-docs, technical staff, and programmatic support. Funds may be used for any legitimate research-related expense except F&A costs, and may include faculty release time and summer salary support for faculty with 9-month appointments. Support for faculty salaries is restricted to 20% of the total cost of the project. Limited amounts of funds can be used for administrative support and/or to support workshops/symposia necessary for the success of GRIP4PSI awardees. Program funds are not intended to support equipment purchases, however, funds to build innovative devices or instruments are permitted if justified.

Key Dates:

Pre-planning proposal due date: **March 4, 2019**

Planning proposal due date: **May 15, 2019**

Full proposal due date: **September 16, 2019**

Funding anticipated to commence: **January 6, 2020**

Eligibility

Co-PIs are required for each proposal team and must be NC State faculty members from at least two colleges that have funded the GRIP4PSI initiative. Those colleges that have funded the GRIP4PSI include CALS, COE, COS, CNR, PCOM, and WCOT. Faculty in colleges that have not funded the GRIP4PSI initiative are also encouraged to participate on proposal teams. Should awards be made to teams with faculty from a college that has not funded the GRIP4PSI initiative, it is expected that their college will provide 50% of the funding that is awarded by GRIP4PSI to their college. For example, if faculty from college X are to be awarded \$50,000 over 3.5 years for their efforts as part of a GRIP4PSI team then college X would be expected to provide \$25,000 for their efforts over the 3.5 year period of performance.

Co-PIs should have a record of research accomplishment and experience leading or participating on successful interdisciplinary research teams. Faculty may participate on more than one GRIP4PSI team, but may not serve as co-PI on more than one GRIP4PSI full proposal. ORI envisions that teams will be comprised of faculty from several NC State colleges and that full proposals will include clearly stated plans for cross-college collaboration. Projects that leverage infrastructure available at NC State and the NC Dept. of Agriculture and Consumer Services' Research Stations and NC State University Field Labs are encouraged. Teams that include collaborators at other research institutions and industry are welcome, and GRIP4PSI funds may flow outside of NC State.

Process

A three-stage (pre-planning proposal stage, planning proposal stage, full proposal stage) submission and review process will be employed for this large-scale seed-funding initiative. ORI will administer and manage the solicitation, review, award and reporting process. Pre-planning proposals will be reviewed by ORI and senior NC State faculty with guidance from the CALS Dean and the PSI Launch Director to ensure alignment with NC PSI research platforms. Planning proposals and full proposals will each be reviewed via a two-stage process beginning with ORI and senior NC State faculty and ending with leadership from funders of the GRIP4PSI initiative. Reviewers external to NC State may be recruited as well to assist in the

review process. Key contacts for programmatic (Jon) or process (Marie) questions regarding this RFP are [Jon Horowitz](#) or [Marie Grubbs](#). The three-stage process is detailed below:

Pre-Planning Proposal Stage

The intention of this proposal stage is to “lower the barrier of entry” for plant and non-plant scientists, and maximize the number of novel and creative proposals for consideration. Two-page pre-planning proposals should be submitted electronically via [InfoReady Review](#) on or before 5 p.m. on **March 4, 2019**. Submissions must use 1-inch margins and a font size no smaller than 11pt. to ensure readability.

Submission through InfoReady Review: All pre-planning proposals must be submitted for review via [InfoReady Review](#). Follow the link for the GRIP4PSI opportunity and click “Apply.” The system only allows one proposal submission per user.

The first pre-planning proposal page should provide a title and vision of the proposed research program as well as a discussion of its game-changing implications and alignment with one or more NC PSI research platforms. Please be aware that research program descriptions must be written such that they can be assimilated and championed by reviewers with broad scholarly expertise. Specific sources of extramural funding that will be targeted for future proposals should be detailed.

The second pre-proposal page should be devoted to a description of the co-PIs and the proposed project team. This page should provide a compelling rationale for success of the proposed program by citing evidence that the co-PIs have a strong record of research accomplishment and experience leading or participating on successful interdisciplinary research teams. This page should also provide a rationale for the inclusion of participating key personnel as well as address the question “why should the assembled research team be anticipated to compete successfully for extramural funding?”. There is no budget requirement for the pre-planning proposal.

Pre-planning proposals will be selected to move on to the planning proposal stage on or before April 1, 2019.

Pre-planning proposals will be selected based on the following criteria:

Intellectual merit of the proposed activity:

- Impact of the proposed research program, and associated outreach program, on local and global agriculture
- Originality and game-changing implications of the proposed research program for NC State, North Carolina, the nation and the world
- Qualifications and track record of the co-PIs and project faculty
- Need to create the interdisciplinary team
- Potential impact of the project deliverables
- Likelihood that the proposed research program will lead to large-scale research support by government agencies, corporations, industrial consortia and/or foundations
- The degree to which the proposed research program builds on existing NC State strengths

Project fit and feasibility:

- How well the proposed research program advances NC PSI research platforms
- Likelihood that the proposed research program will be successful

Planning Proposal Stage

The intention of the planning proposal stage is to provide emerging GRIP4PSI teams time to ideate, solidify research and outreach strategies, potentially attract additional research team members and develop a proposal that will convey the novelty and impact of the proposed project, as well as its alignment with NC PSI research platforms. Five-page planning proposals should be submitted electronically via (i) [PINS](#) for administrative approvals and proposal tracking purposes and (ii) [InfoReady](#) for review purposes on or before 5 p.m. on **May 15, 2019**. Submissions must use 1-inch margins and a font size no smaller than 11pt. to ensure readability.

PINS Submission: Submit planning proposals through the contact co-PI's (see Management Plan section) college research offices in [PINS](#). Note that PINS routing does not have to be completed at the time of submission to [InfoReady](#). However, PINS routing must have been initiated and the PINS number assigned to the proposal must appear on the proposal cover page to be accepted for review.

Submission through InfoReady Review: All planning proposals must be submitted for review via [InfoReady Review](#). Follow the link for the GRIP4PSI opportunity and click "Apply." The system only allows one proposal submission per user.

The five page planning proposal should provide a title and description of the proposed research program as well as a detailed discussion of its game-changing implications and alignment with one or more NC PSI Research Platforms. Specific sources of extramural funding that will be targeted for future proposals should be detailed. There is no budget requirement for the planning proposal. In addition to detailing the proposed research program, and the role each member of the proposal team will play, the planning proposal should address:

1. The impact that the proposed program will have on graduate education and training.
2. How the proposed program will be leveraged for extension and outreach activities, including education of students and the general public.
3. Social implications of the proposed work and mechanisms that will be put in place to address these considerations.

Please be aware that research program descriptions must be written such that they can be assimilated and championed by reviewers with broad scholarly expertise. Planning proposals will be selected to move on to the full proposal stage on or before June 1, 2019.

Planning proposals will be selected based on the following criteria:

Intellectual merit of the proposed activity:

- Impact of the proposed research program, and associated outreach program, on local and global agriculture
- Originality and game-changing implications of the proposed research program for NC State, North Carolina, the nation and the world
- Qualifications and integration of the co-PIs and project faculty within the research program
- Need to create the interdisciplinary team
- Potential impact of the project deliverables
- Likelihood that the proposed research program will lead to large-scale research support by government agencies, corporations, industrial consortia and/or foundations

- The degree to which the proposed research program builds on existing NC State strengths
- Impact of the proposed research program on graduate education/training, extension activities, and society

Project fit and feasibility:

- How well the proposed research program advances NC PSI Research Platforms
- Likelihood that the proposed research program will be successful

Full Proposal Stage

The intention of the full proposal stage is to produce a compelling, mature research proposal that will facilitate the selection of teams for awards. Full proposals must be submitted via (i) [PINS](#) for administrative approvals and proposal tracking purposes and (ii) [InfoReady](#) for review purposes.

PINS Submission: Submit full proposals through the contact co-PI's (see Management Plan section) college research office in [PINS](#). Note that PINS routing does not have to be completed at the time of submission to InfoReady. However, PINS routing must have been initiated and the PINS number assigned to the proposal must appear on the proposal cover page to be accepted for review.

Submission through InfoReady Review: All full proposals must be submitted for review via [InfoReady Review](#). Follow the link for the GRIP4PSI opportunity and click "Apply." The system only allows one proposal submission per user.

Full proposals must be organized as follows:

Proposal Cover Page (1 page): Please use the template page found [here](#). Include the title of the project, a list of 5 key words, principal investigator contact information, list of other key personnel and their college affiliation, a 200-word (maximum) synopsis of the proposed research program that is appropriate for a broad faculty readership, and total amount of funding requested.

Project description (10 pages): The project description must address how the proposed project is consistent with the goals of the NC PSI, emphasizing game-changing implications and interdisciplinarity (including graduate education and training), its impact on local and global agriculture and the potential for large-scale extramural follow-on funding. Also describe how the proposed project complements existing research/outreach efforts at NC State. The description should include sufficient detail such that reviewers can evaluate the appropriateness and feasibility of the proposed plans. Please keep in mind that not all reviewers will be experts in every proposed field of study, and thus project descriptions should be written for a broad audience. The project description must outline a clear set of goals that are aspirational yet attainable, an outline of the plan of work with milestones to be achieved in the first year of funding, metrics to gauge success throughout the course of the three-years of funding, and a detailed plan for sustainability of the proposed research program via the attraction of extramural support. Should success of the proposed project be dependent on the acquisition of large-scale instrumentation to be located in University Shared Core Research Facilities, this information must be included as part of the project description. Plans for extramural funding should be as specific as possible, including agency or source names, programs that would be the source of funding, timelines for proposal submissions and potential amounts of funding. In addition to detailing the proposed research program, and the role each member of the proposal team will play, the planning proposal should address:

1. The impact that the proposed program will have on graduate education and training.
2. How the proposed program will be leveraged for extension and outreach activities, including education of students and the general public.
3. Social implications of the proposed work and mechanisms that will be put in place to address these considerations.

Management Plan (1 page): This section is intended to document plans for the interaction of co-PIs with themselves and other members of the project team, and delineate the co-PIs' respective roles and responsibilities. In particular, this page should describe specific "assignments" of the co-PIs (e.g., co-PI #1 will be responsible for Specific Aim #1 and be responsible for doing X, co-PI #2 will work on Specific Aim #2 and be in charge of Y, etc.). This section should also state who will serve as the contact co-PI for interactions with University administrators. The management plan should describe the process for deciding scientific direction and communication procedures, such as regularly scheduled meetings of the co-PIs, periodic evaluation of research progress and finances, as well as strategies to mitigate and resolve potential conflicts or disagreements.

Budget (1-2 pages): A single 3.5 year budget with justifications for specific expenditures, if necessary. Please use the budget template form found [here](#). Budgets should reflect the cross-college spirit of the GRIP4PSI initiative as well as the distribution of effort by the co-PIs. Funds may be used for any legitimate research-related expense except F&A costs, and may include faculty release time and summer salary support for faculty with 9-month appointments. Support for faculty salaries is restricted to 20% of the total cost of the project. Limited amounts of funds can be used for administrative support and/or to support workshops/symposia necessary for the success of GRIP4PSI awardees. Program funds are not intended to support equipment purchases, however, funds to build innovative devices or instruments are permitted if justified. As for planning proposals, collaborations with other research institutions and industry are welcome and funds may flow from NC State for this purpose. Cost sharing is allowed. Internal cost share amounts are capped at \$100,000 total. There is no limit on external cost share amounts.

Biosketches (1-2 pages): Please use the template found [here](#). One- to two-page bio sketches (each) of the co-PIs and all key personnel are required that includes relevant publications and research funding to date. PIs should not assume that reviewers will search for additional information elsewhere; bio sketches should provide complete, compelling arguments that the included faculty are both required and sufficient to accomplish the proposal's stated goals.

Submissions must use 1-inch margins and use a font size no smaller than 11pt. to ensure readability. The deadline for submission of full proposals will be on or before 5 p.m. on **September 16, 2019**.

Rankings of full proposals will be based on the following criteria:

Intellectual merit of the proposed activity:

- Impact of the proposed research program on local and global agriculture
- Originality and game-changing implications of the proposed research program for NC State, North Carolina, the nation and the world
- Qualifications and integration of the co-PIs and project faculty within the research program
- Likelihood that the proposed research program will lead to large-scale research support by government agencies, corporations, industrial consortia or foundations
- The degree to which the proposed project builds on existing NC State strengths

- Impact of the proposed research program on graduate education/training, extension activities, and society

Project fit and feasibility:

- How well the proposed research program, and associated outreach program, advances PSI's research platforms
- Synergy among team members to enable research of a scope and complexity commensurate with the scale of GRIP4PSI support
- Likelihood that the proposed research program will be successful
- Clear description and feasibility of the milestones and metrics
- A coherent management plan detailing how the project will be executed as a team effort
- Reasonableness of the budget
- Likelihood for long-term sustainability of the research program via extramural funding

Rankings of full proposals will be completed on or before October 16, 2019. All or a subset of full proposal teams will be required to make an oral presentation to a review panel prior to the finalization of rankings. Co-PIs of proposals selected for funding will be notified on or before December 2, 2019.

Expectations of Proposal Teams

In addition to research/training/outreach productivity and judicious use of resources, GRIP4PSI teams are expected to interact productively with a team of faculty funded to study the progress of the GRIP4PSI initiative and promote effective and collaborative science.

Decision Regarding Continued Funding

Seventeen months after funds are made available, a two-page report describing accomplishments to date as well as a complete financial accounting of GRIP4PSI fund expenditures will be due to the [Research Development Office](#). A decision regarding the release of funds for the next twelve months will be made by the Vice Chancellor for Research and Innovation and the CALS Dean within two weeks. Criteria to be employed to review accomplishments to date and assess research program progress include:

- Are the accomplishments to date consistent with the timeline and metrics presented in the full proposal? If not, do reasonable extenuating circumstances explain lack of progress?
- Are project expenditures to date consistent with progress of the research program and the budget accompanying the full proposal?
- Have there been any changes to the timeline for research or plans for the solicitation of extramural funding?

Similarly, eleven months later (*i.e.*, after 2.5 years of funding), a two-page report describing accomplishments to date as well as a complete financial accounting of GRIP4PSI fund expenditures will be due to the [Research Development Office](#). A decision regarding the release of funds for the third year of funding will be made within two weeks.

Assistance From the Proposal Development Unit for GRIP-Assisted Large-Scale Proposals

GRIP4PSI awardees are guaranteed assistance from the NC State Proposal Development Unit (PDU) for large-scale follow-on awards (*e.g.*, Center-type grants, training grants, etc.) that spring from GRIP4PSI funding. Please be aware that it is the PI's responsibility to contact the PDU well in advance of the due date to ensure that your proposal can be prioritized.

Final Report

On or before two months after the end of the third year of GRIP4PSI funding, a two-page final report will be due to the [Research Development Office](#) that details accomplishments to date. This report should describe research accomplishments as well as tangible results, such as publications, presentations, symposia, patents, grant submissions/awards, which were produced/obtained as a consequence of funding by the GRIP4PSI program. Plans for the submission of proposals for extramural funding should be included, and the Research Development Office should be notified of all subsequent awards. Failure to submit in a timely manner a final report on research facilitated by this seed-funding program will preclude the contact PI from receiving future awards from any ORI internal seed-funding program.

Research Retreat

An annual university-wide research retreat will be hosted by ORI to enable winning GRIP4PSI teams to share their accomplishments and findings with the NC State community. All project co-PIs would be required to attend and present at the annual retreat. The retreat will also include presentations on new grant funding opportunities and facilitated brainstorming sessions to identify additional new and innovative ideas for future interdisciplinary research projects.

Inquiries

Programmatic and process questions regarding this funding opportunity may be directed to:

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