

**Office of Science
Financial Assistance
Funding Opportunity Announcement
DE-FOA-0000417**

***Plant Feedstock Genomics for Bioenergy:
A Joint Research Funding Opportunity
Announcement USDA, DOE***

SUMMARY:

The U.S. Department of Energy's Office of Science, Office of Biological and Environmental Research (OBER), and the U.S. Department of Agriculture (USDA), National Institute of Food and Agriculture (NIFA), hereby announce their interest in receiving applications for genomics-based research that will lead to the improved use of biomass and plant feedstocks for the production of fuels such as ethanol or renewable chemical feedstocks. Specifically, applications are sought for fundamental research on plants that will improve biomass characteristics, biomass yield, or sustainability. Systems biology approaches to identify genetic indicators enabling plants to be efficiently bred or manipulated, or research to predict phenotype from underlying genotype that could lead to improved feedstock characterization and sustainability are also encouraged.

PREAPPLICATIONS

Potential applicants are required to submit a brief preapplication, referencing **DE-FOA-0000417** for receipt by DOE by **4:30 p.m.**, Eastern Time, **December 17, 2010**. Preapplications will be reviewed for conformance with the guidelines presented in the Funding Opportunity Announcement (FOA) and suitability in the technical areas specified. A response to the preapplications encouraging or discouraging formal applications will be communicated to the applicants by **January 10, 2011**. Applicants who have not received a response regarding the status of their preapplication by this date are responsible for contacting the program to confirm this status.

Only those preapplicants that receive notification from DOE encouraging a formal application may submit full applications. **No other formal applications will be considered.**

Preapplications referencing **DE-FOA-0000417** should be sent as PDF file attachments via e-mail to: SCbiomass.genomics@science.doe.gov with "**Preapplication DE-FOA-0000417**" as the subject. **No FAX or mail submission of preapplications will be accepted.**

Potential applicants must submit a brief preapplication that consists of a cover page plus two to three pages of narrative describing the research objectives, the technical approach(s), and the proposed team members and their roles. The intent in requesting a preapplication is to save the time and effort of applicants in preparing and submitting a formal project application that may be

inappropriate for the program. Preapplications will be reviewed relative to the scope and research needs as outlined in the summary paragraph and in the SUPPLEMENTARY INFORMATION. The preapplication must identify, on the cover sheet, the title of the project, the institution or organization, principal investigator name, telephone number, fax number, and e-mail address. No budget information or biographical data need be included, nor is an institutional endorsement necessary.

APPLICATION DUE DATE: February 25, 2011, 11:59 PM Eastern Time.

Formal applications submitted in response to this FOA must be received by February 25, 2011, 11:59 p.m. Eastern time, to permit timely consideration of awards. **APPLICATIONS RECEIVED AFTER THE DEADLINE WILL NOT BE REVIEWED OR CONSIDERED FOR AWARD.**

IMPORTANT SUBMISSION INFORMATION: The full text of the Funding Opportunity Announcement (FOA) is located on FedConnect. Instructions for completing the Grant Application Package are contained in the full text of the FOA which can be obtained at: <https://www.fedconnect.net/FedConnect/?doc=DE-FOA-0000417&agency=DOE>. To search for the FOA in FedConnect click on "Search Public Opportunities". Under "Search Criteria", select "**Plant Feedstock Genomics for Bioenergy: A Joint Research Funding Opportunity Announcement USDA, DOE**", then click on "Search". Once the screen comes up, locate the appropriate FOA.

In order to be considered for award, Applicants must follow the instructions contained in the FOA.

WHERE TO SUBMIT: Applications must be submitted through Grants.gov to be considered for award.

You cannot submit an application through Grants.gov unless you are registered. Please read the registration requirements carefully and start the process immediately. Remember you have to update your CCR registration annually. If you have any questions about your registration, you should contact the Grants.gov Helpdesk at 1-800-518-4726 to verify that you are still registered in Grants.gov.

Registration Requirements: There are several one-time actions you must complete in order to submit an application through Grants.gov (e.g., obtain a Dun and Bradstreet Data Universal Numbering System (DUNS) number, register with the Central Contract Registry (CCR), register with the credential provider, and register with Grants.gov). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist at <http://www.grants.gov/assets/OrganizationRegCheck.pdf> to guide you through the process. Designating an E-Business Point of Contact (EBiz POC) and obtaining a special password called an MPIN are important steps in the CCR registration process. Applicants, who are not registered with CCR and Grants.gov, should allow at least 21 days to complete these requirements. It is suggested that the process be started as soon as possible.

IMPORTANT NOTICE TO POTENTIAL APPLICANTS: When you have completed the process, you should call the Grants.gov Helpdesk at 1-800-518-4726 to verify that you have completed the final step (i.e. Grants.gov registration).

Questions: Questions relating to the registration process, system requirements, how an application form works, or the submittal process must be directed to Grants.gov at 1-800-518-4726 or support@grants.gov. Part VII of the FOA explains how to submit other questions to the Department of Energy (DOE).

All applications should be in a single PDF file.

GENERAL INQUIRIES ABOUT THIS FUNDING OPPORTUNITY ANNOUNCEMENT (FOA) SHOULD BE DIRECTED TO:

Technical/Scientific Program Contact:

Program Manager: Dr. Catherine M. Ronning
U. S. Department of Energy
Office of Biological and Environmental Research
Phone: 301-903-9549
E-Mail: Catherine.ronning@science.doe.gov

Program Manager: Dr. Ed Kaleikau
U.S. Department of Agriculture
National Institute of Food and Agriculture
Phone: 202-401-1931
E-Mail: ekaleikau@nifa.usda.gov

Merit Review

Applications will be subjected to scientific merit review (peer review) and will be evaluated against the following evaluation criteria which are listed in descending order of importance codified at 10 CFR 605.10(d):

1. Scientific and/or Technical Merit of the Project;
2. Appropriateness of the Proposed Method or Approach;
3. Competency of Applicant's Personnel and Adequacy of Proposed Resources; and
4. Reasonableness and Appropriateness of the Proposed Budget.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the FOA and the agencies' programmatic needs. Note that external peer reviewers are selected with regard to both their scientific expertise and the absence of conflict-of-interest issues. Both Federal and non-Federal reviewers may be used, and submission of an

application constitutes agreement that this is acceptable to the investigator(s) and the submitting institution.

DOE and USDA will make final funding decisions based on the results of the peer review and internal programmatic review. USDA agrees to abide by DOE's application review procedures. Applicants selected for funding may be required to provide additional information. The application will then be forwarded to the appropriate offices for funding in accordance with each agency's procedures. Applications that USDA has agreed to fund will be sent to the agency for final negotiations and implementation of awards. Applicants selected for funding by USDA will be required to submit NIFA agency-specific forms prior to awarding of the grant by USDA.

PROGRAM FUNDING: It is anticipated that up to \$6 million total will be available for multiple awards to be made in FY 2011 for the Plant Feedstock Genomics for Bioenergy: A Joint Research Funding Opportunity Announcement-USDA, DOE. The number of awards will be contingent on satisfactory peer review, the availability of appropriated funds, and the size of the awards. Multiple year funding is expected. Applications may request project support for up to three years, with out-year support contingent on the availability of funds, progress of the research, and programmatic needs; it is anticipated that this will reflect a long term commitment to improved use of primary feedstocks or residues for energy resources. Annual budgets are expected to range from \$200,000 to \$500,000 total costs.

Neither DOE nor USDA is under any obligation to pay for any costs associated with the preparation or submission of an application. DOE and USDA reserve the right to fund, in whole or in part, any, all, or none of the applications submitted in response to this FOA.

SUPPLEMENTARY INFORMATION: In FY 2011, USDA support for this Plant Feedstock Genomics for Bioenergy FOA is available through the Agriculture and Food Research Initiative (AFRI) Competitive Grants Program.

Renewable energy from biomass has the potential to reduce or remove dependency on fossil fuels as well as reduce negative environmental impacts from emissions of greenhouse gases and toxic pollutants. Realizing this potential will require the simultaneous development of high yielding biomass production systems and bioconversion technologies that efficiently convert biomass energy into the forms of energy usable by industry. Most agricultural research to date has focused on enhancing the production of seeds, roots and tubers that are used for food and feed production. However, these improvements in food crops have frequently been directed towards increases in starch content with a corresponding reduction of lignocellulose accumulation. Research applications are solicited for genomics-based research that will lead to improved utilization of plant biomass for the production of fuels such as ethanol or renewable chemical feedstocks. This FOA continues a commitment, initiated in 2006, to conduct a fundamental research program in biomass genomics, to provide the scientific foundation to facilitate the use of lignocellulosic materials, either primary material or agricultural residues, for bioenergy and biofuels. The rationale for developing lignocellulosic crops for energy is that less intensive production techniques and poorer quality land can be used for these crops, thereby avoiding competition with food production on better quality land.

Significant advances in breeding, molecular genetics, and genomic technologies provide an opportunity to build upon the existing knowledgebase of plant biology to be able to confidently predict and manipulate their biological function for bioenergy resources. Specific areas of interest include:

- Phenotyping plant germplasm collections and advanced breeding lines in public breeding programs of bioenergy crops (*Brachypodium*, energy cane, *Miscanthus*, sorghum, switchgrass) to discover and deploy valuable alleles for bioenergy traits such as:
 - biomass yield, quantity and quality of key metabolites (sugars, starches, lignocelluloses);
 - adaptation to temperature extremes, drought (water use efficiency), salinity, nitrogen use efficiency.

Applicants must ensure that 1) relevant germplasm is available for distribution and use; 2) standardized methods for high-throughput phenotyping are feasible or will need to be developed as part of the application; and 3) phenotype data generated will be publically available. In addition, if collections from the USDA National Plant Germplasm System (NPGS) are employed, research applicants must confer and coordinate with the crop-specific curators in the USDA NPGS (www.ars-grin.gov/npgs/index.html) and appropriate public plant breeding programs and ensure that phenotype data generated will be entered and curated in the Germplasm Resource Information Network database (GRIN) and other public databases for breeders to use. *Although high-throughput methods can be proposed and developed to facilitate efficient screening for these traits, applications focused solely on methods development are not acceptable.*

- Fundamental research to enhance translation of genomics information into cultivar improvement (“phenomics”) utilizing bioenergy crops for which genomic resources are available or are currently being developed: *Brachypodium*, *Miscanthus*, *Populus*, sorghum, switchgrass; *Brachypodium* is acceptable if the application to a bioenergy crop(s) is clearly outlined. Specific areas include:
 - genotype-to-phenotype: functionality determination and confirmation of candidate bioenergy-relevant genes (biomass yield, quantity, and quality; environmental adaptation);
 - systems biology approaches, including integration of complex data, to predict phenotype from genotype (e.g., reconstruction of metabolic pathways and regulatory networks relevant to bioenergy traits).

Research that seeks to increase starch content for improved nutrient qualities or to facilitate the digestion and fermentation of starch to produce sugars and other bio-based products or biofuels is not the focus of this FOA. Also, research that seeks to increase grain yield or seed-oil production is not the focus of this FOA.

Projects **should not** request support for whole genome-scale sequencing; such requests should be submitted separately to the DOE Joint Genome Institute's Community Sequencing Program for an independent merit review (see information at <http://www.jgi.doe.gov/CSP/index.html>). This FOA strongly encourages individual investigators as well as interdisciplinary teams that assemble a range of expertise into a coordinated approach; for the latter situation, applicants must include a clear plan describing the individual contributions of each participant, as well as the overall management scheme.

Information about the DOE Genomic Science Program (Genomics:GTL) data release policy, with which awardees will be expected to comply, is available at <http://genomicscience.energy.gov/datasharing/index.shtml>

For USDA:

- All sequence and expression data must be released to public repositories (e.g., GenBank under the Bermuda standards; Gene Expression Omnibus (GEO) under Minimum Information About a Microarray Experiment (MIAME) compliance; etc.). All phenotype and map data must be deposited into an appropriate public database (e.g., major databases of the research community, etc.) in a rapid timeframe after quality control tests.
- Researchers are encouraged to confer with the Crop Curators and Crop Germplasm Committees (CGCs) in the USDA National Plant Germplasm System (NPGS) (www.ars-grin.gov/npgs/index.html) regarding the desirability of depositing genetic stocks and experimental plant populations generated into the NPGS genebanks. Crop curators and the researchers need to define mutual responsibilities for quality assurance, replenishing depleting stock, and the projected duration for the NPGS's commitment to curate these materials.
- Beginning in 2007, Consultative Group on International Agricultural Research (CGIAR) International Agricultural Research Centers (e.g., International Maize and Wheat Improvement Center (CIMMYT); International Rice Research Institute (IRRI), International Center for Tropical Agriculture (CIAT), International Potato Center (CIP), International Crops Research Institute for the Semi-Arid Tropics (ICRISAT), International Center for Agricultural Research in the Dry Areas (ICARDA)) and some national genebanks began distributing germplasm of certain crops accompanied by the Food and Agriculture Organization (FAO) International Treaty's Standard Material Transfer Agreement (SMTA). Researchers are encouraged to confer with their host institution regarding how such materials should be handled. For further information, see the International Treaty's web site at http://www.planttreaty.org/smta_en.htm
- For issues about intellectual property policy, applicants should consult the Agency's intellectual property web page at <http://www.nifa.usda.gov/business/awards/intellprop.html>

Information about the program, including prior year award abstracts, is available at <http://www.genomicscience.energy.gov/research/DOEUSDA/>.

Indirect Costs:

For DOE: Explain the basis for each overhead and indirect cost. Include the current rate.

For USDA: Section 7132 of the Food, Conservation, and Energy Act of 2008, amended the National Agriculture Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3310(a)), limiting indirect costs to 22 percent of the total Federal funds provided under each award. To accommodate USDA limit on indirect costs, applicants may be required at the time of award to submit a revised budget.

Applications selected for funding by USDA will be required to limit their requests for recovery of indirect costs to the lesser of their institution's official negotiated indirect cost rate or the equivalent of 22 percent of total Federal funds awarded.

Annual Meeting:

If a project is funded, beginning in the first year of funding, at least one member of the project team will be required to attend annual investigator meetings; these meetings may be held in conjunction with internationally attended genomics meetings (e.g. Plant and Animal Genome) or jointly with other DOE or USDA program meetings (e.g. the Genomic Science Program meeting) as specified by the USDA and DOE program managers. Reasonable travel expenses may be submitted as part of the project budget.

The Catalog of Federal Domestic Assistance number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605.

Posted on the Office of Science Grants and Contracts Web Site
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