

Office of Science
Notice DE-FG02-06ER06-03

Plant Feedstock Genomics
for Bioenergy: A Joint Research Solicitation- USDA, DOE

U.S. Department of Energy

**Office of Science Financial Assistance Program Notice
DE-FG02-06ER06-03; Plant Feedstock Genomics for Bioenergy: A Joint Research
Solicitation- USDA, DOE**

AGENCY: U.S. Department of Energy
Office of Science

ACTION: Notice inviting grant applications.

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), Cooperative State Research, Education, and Extension Service (CSREES), National Research Initiative (NRI) 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 that will facilitate lignocellulosic degradation. Systems biology approaches to identify genetic indicators enabling plants to be efficiently bred or manipulated, or research that yields fundamental knowledge of the structure, function and organization of plant genomes leading to improved feedstock characterization and sustainability are also encouraged.

DATES: Potential applicants are required to submit a brief preapplication, **referencing Program Notice DE-FG02-06ER06-03 for receipt by DOE by 4:30 p.m., Eastern Time, December 15, 2005.** Preapplications will be reviewed for conformance with the guidelines presented in this Notice and suitability in the technical areas specified in this Notice. A response to the preapplications encouraging or discouraging formal applications will be communicated to the applicants by **December 23, 2005.**

Only those preapplicants that receive notification from DOE or USDA encouraging a formal application may submit full applications. **No other formal applications will be considered.** Formal applications in response to this Notice must **be received by DOE by 8:00 p.m., Eastern Time, February 23, 2006.**

ADDRESSES: Preapplications referencing Program Notice DE-FG02-06ER06-03 should be sent as PDF file attachments via e-mail to: **SCbiomass.genomics@science.doe.gov** with

"Preapplication DE-FG02-06ER06-03" as the subject. No FAX or mail submission of preapplications will be accepted.

DOE Eligibility Criteria: Applicants from U.S. Colleges and universities, non-profit organizations, for-profit commercial organizations, state and local governments, and unaffiliated individuals. Researchers from Federally Funded Research and Development Centers (FFRDCs) or DOE National Laboratories should respond to Program Announcement LAB 06-03. Researchers from other Federal agencies are encouraged to submit a preapplication referencing this Program Notice DE-FG02-06ER06-03; if a formal proposal is encouraged, additional submission information will be provided.

USDA Eligibility Criteria: The source of USDA funds to support the fiscal year (FY) 2006 Plant Feedstock Genomics for Bioenergy Program is the National Research Initiative (NRI) Competitive Grants Program. Except where otherwise prohibited by law, State agricultural experiment stations, all colleges and universities, other research institutions and organizations, Federal agencies, national laboratories, private organizations or corporations, and individuals are eligible to apply for and to receive a competitive grant. Faculty at small and mid-sized academic institutions with limited institutional success and faculty at institutions in USDA Experimental Program for Stimulating Competitive Research (EPSCoR) entities are encouraged to apply (for definitions of small and mid-sized institutions and for EPSCoR eligibility see Part II, C., 2.(c) of the FY 2006 NRI Request for Applications at http://www.csrees.usda.gov/funding/rfas/nri_rfa.html). Applications from scientists at non-U.S. organizations will not be accepted. Award recipients may subcontract to organizations not eligible to apply, provided such organizations are necessary for the conduct of the project. This program is listed in the Catalog of Federal Domestic Assistance (CFDA) under 10.206, Grants for Agricultural Research Competitive Research Grants.

Formal Applications

Applications submitted to the Office of Science must be submitted electronically through Grants.gov to be considered for award. The Funding Opportunity Number is: DE-FG02-06ER06-03 and the CFDA Number for the Office of Science is: 81.049. Instructions and forms are available on the [Grants.gov](http://www.grants.gov) website. Please see the information below and also refer to the "Funding Opportunity Announcement", Part IV - Application and Submission Information; H. Other Submission and Registration Requirements for more specific guidance on "Where to Submit" and "Registration Requirements." If you experience problems when submitting your application to Grants.gov, please visit their customer support website: <http://www.grants.gov/CustomerSupport>; email: support@grants.gov; or call 1-800-518-4726.

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](http://www.grants.gov)). See <http://www.grants.gov/GetStarted>. Use the Grants.gov Organization Registration Checklist 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 14 days** to complete these requirements. It is suggested that the process be started as soon as possible.

VERY IMPORTANT - Download PureEdge Viewer: In order to download the application package, you will need to install PureEdge Viewer. This small, free program will allow you to access, complete, and submit applications electronically and securely. For a free version of the software, visit the following Web site: <http://www.grants.gov/DownloadViewer>.

GENERAL INQUIRIES ABOUT THIS NOTICE SHOULD BE DIRECTED TO:

SCbiomass.genomics@science.doe.gov

Agency Contacts:

Dr. Sharlene C. Weatherwax
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The full text of Program Notice DE-FG02-06ER06-03 is available via the Internet using the following web site address: <http://www.science.doe.gov/grants/grants.html>.

SUPPLEMENTARY INFORMATION: 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 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 topic.

Research applications are solicited in the area of improved fundamental understanding of lignocellulosic accumulation and regulation that will lead to improved utilization of plant biomass for the production of fuels such as ethanol or renewable chemical feedstocks. This notice initiates a commitment to establish 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:

- Elucidation of the regulation of genes, proteins and metabolites for manipulation of recalcitrant lignocellulosics for improved productivity, processing, or growth characteristics on marginal environmental conditions (e.g. drought tolerance);
- Development of novel technologies to facilitate the analysis and manipulation of cell wall structure and composition for both breeding and basic research;
- Genomic approaches leading to identification of genetic markers enabling more efficient plant breeding or manipulation;
- Enhanced fundamental knowledge of the structure, function, and organization of plant genomes leading to improved feedstock characterization;
- The use or development of model biological systems is acceptable; however, a specific statement must be provided on the linkage of the model to current or future biomass energy crops. The use or augmentation of existing genomic information and resources is strongly encouraged.

Projects that would involve field demonstrations or testing or empirical screening for biomass quality characteristics **will not be** considered for funding. Projects requesting support solely for whole genome sequencing **will not be** considered for funding. Any requests for genome sequencing (e.g., for development of novel biomass model plant systems) should provide clear justification for the need for the sequence, efficient use of any currently available sequence information, and a coherent description of how this new genome sequencing will lead to improvements in feedstock characterization and bioenergy resources. Such requests will be coordinated with existing programmatic and technical capabilities and capacity at the DOE Joint Genome Institute and thus should not be included in the budget request and justification.

This notice 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.

Preapplications

Potential applicants **must** submit a brief preapplication that consists of two to three pages of narrative describing the research objectives, the technical approach(s), and the proposed team members and their expertise. 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 should identify, on the cover sheet, the title of the project, the institution, 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.

Program Funding

It is anticipated that up to \$3 million total will be available for multiple awards to be made in FY 2006 for the Plant Feedstock Genomics for Bioenergy: A Joint Research Solicitation-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 \$100,000 to \$500,000 total costs, unless there is prior approval from the Program Manager. 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 Notice.

FY 2006 USDA support for this Plant Feedstock Genomics for Bioenergy solicitation is authorized in 7 U.S.C. 450i(b). The NRI Competitive Grants Program supports research grants addressing key problems of National and regional importance to agriculture, forestry, and related sciences. The biomass and plant feedstock is a key component to the sustainability of U.S. agriculture, forestry, and environmental health.

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.

In addition to the above evaluation criteria, applications will also be evaluated on the robustness of the organizational framework and its coordination plan if a consortium is proposed.

The evaluation process will include program policy factors such as the relevance of the proposed research to the terms of the announcement 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. Awards may be given as cooperative agreements, or grants, at each agency's discretion. Proposals that USDA has agreed to be fund will be sent to the agency for final negotiations and implementation of awards. Applicants selected for funding by USDA will be requested to submit paper copies of their proposals with all associated USDA forms. These Application Forms may be downloaded from the USDA website at <http://www.csrees.usda.gov/funding/forms.html>.

For USDA: As prescribed by section 1462 of the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (7 U.S.C. 3310), USDA limits indirect cost rates to 19 percent of total Federal funding for applicable direct costs. Section 709 of the FY 2006 Consolidated Appropriations Act (Public Law 109-97) limits indirect costs to 20 percent of the total Federal funds provided under each award. Therefore, when preparing budgets, applicants should limit their requests for recovery of indirect costs to the lesser of their institution's official negotiated indirect cost rate or the equivalent of 20 percent of total Federal funds awarded. Another method of calculating the maximum allowable is 25 percent of the total direct costs. If no rate has been negotiated, a reasonable dollar amount (equivalent to or less than 20 percent of total Federal funds requested) in lieu of indirect costs may be requested, subject to approval by USDA. This same indirect cost limitation applies to subcontracts. If USDA funds a project through this solicitation, the indirect cost rate will be adjusted to a maximum of 20 percent, and the award level will be adjusted accordingly. To accommodate the USDA limit on indirect costs, applicants may be required at the time of award to submit a revised budget. Proposals selected for funding by USDA will be asked to comply with the USDA 20 percent limit on indirect cost rates.

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 Genomics:GTL program meeting). Reasonable travel expenses may be submitted as part of the project budget.

Submission Information

Other information about the development and submission of applications, eligibility, limitations, evaluation, selection process, and other policies and procedures including detailed procedures for submitting applications from multi-institution partnerships may be found in 10 CFR Part 605, and in the Application Guide for the Office of Science Financial Assistance Program. Electronic access to the Guide is available at: <http://www.science.doe.gov/grants/grants.html>.

The following is a list of essential items that an application must contain:

1. The Face Page SF-424 (R&R) - completed and signed by appropriate officials.
2. Research and Related Budget Page(s) (OMB Number: 4040-0001) using U.S. dollars, with supporting written justification sufficient to evaluate the costs of the proposed project. List and explain cost-sharing arrangements, if any. If the application is for a multi-year period, use one budget page for each year of requested support.
3. Research & Related Other Project Information
 - a. Project Narrative: A detailed description of the proposed project, including the objectives of the project, its relationship to the Office of Science and CSREES programs and the applicant's plan for carrying it out. Use English only.
 - b. Biographical Sketches: Detailed information about the background and experience of the principal investigator(s) including references to publications.
 - c. Facilities and Resources: Include information on the experience of the applicant organization, its facilities and resources.
 - d. Bibliography of Literature.
 - e. Statement of all current and pending support for the project and all related projects, and description of support for all projects which involve the principal investigator(s) and the period of time devoted to each project.

In addition, for this Notice, applications must conform to the following requirements:

- f. The Project Narrative comprises the research plan for the project and is limited, including text and figure legends, to **15 pages maximum** (8.5x11-inch pages of single-spaced, standard 11-point type with 1-inch margins pages), exclusive of attachments such as figures or references. It should contain enough background material in the Introduction, including review of the relevant literature, to demonstrate sufficient knowledge of the state of the science. The major part of the narrative should be devoted to a description and justification of the proposed project, including details of the method to be used. It should also include a timeline for the major activities of the proposed project, and should indicate which project personnel will be responsible for which activities.
- g. Inclusion of an abstract or project summary on a separate page with the name of the applicant, mailing address, phone number, FAX number, and E-mail listed.
- h. Inclusion of a Table of Contents.

i. Inclusion of letters of intent from collaborators (briefly describing the intended contribution of each to the research), and short curriculum vitas for the applicant and any co-PIs.

j. Inclusion of a Conflict of Interest Document (no page limit): This document should be provided in table or spreadsheet form only as an appendix to the full application at the time of submission. The document should consist of a list, in the form of a single alphabetized table, with the full names (Last name, first name, middle initial) of all people having a conflict of interest with any senior personnel (PI and Co-PIs) and any named personnel member whose salary is requested in the project budget. Conflicts to be identified are (1) Ph.D. thesis advisors or advisees, (2) collaborators or co-authors for the past 48 months, including postdoctoral advisors or advisees, and (3) any other individuals or organizations with which the investigator has financial ties (please specify type). Members of current Advisory Committees who receive reimbursement for travel or honoraria should be included in this last category.

For USDA: If an application is recommended for funding by USDA-CSREES, the applicant must submit the following on Form CSREES-2007, Conflict of Interest: (a) All co-authors on publications within the past four years, including pending publications and submissions; (b) all collaborators on projects within the past four years, including current and planned collaborations; (c) all thesis or postdoctoral advisees/advisors within the past four years; and (d) all persons in your field with whom you have had a consulting or financial arrangement within the past four years, who stand to gain by seeing the project funded. The program contact must be informed of any additional conflicts of interest that arise after the application is submitted.

The Catalog of Federal Domestic Assistance (CFDA) number for this program is 81.049, and the solicitation control number is ERFAP 10 CFR Part 605. The CFDA number for the USDA program is 10.206, Grants Agricultural Research - Competitive Research Grants.

Martin Rubinstein
Director
Grants and Contracts Division
Office of Science

Posted on the Office of Science Grants and Contracts Web Site
November 29, 2005.