

# Microbial Biology (B): Microbial Associations with Plants

## National Program Leader: Ann Lichens-Park

[apark@csrees.usda.gov](mailto:apark@csrees.usda.gov)

### Program Goals

- To improve resistance to high-impact plant diseases
- Develop novel mechanisms of manipulating plant-associated microbes by interfering with microbial cell-to-cell signaling
- Improved understanding of pathogen survival & spread

### Program Priorities

- Molecular mechanisms of disease or resistance interactions between microbial pathogens and host plants
  - Note: Proposals that focus on plant genes without significant focus on the microbe are not appropriate for this program.
- Molecular mechanisms of microbial communication with other microbes and with non-microbial organisms
- Mechanisms by which plant pathogens and human food safety pathogens spread over short distances

# Microbial Biology (B): Microbial Associations with Plants Program Changes for FY 2008

- Letters of Intent now required. **Due: 10/9/07**
- Short distance spread may be studied using plant pathogens and/or food safety pathogens

**Please Note:** If use of model systems is proposed, knowledge gained from model systems must be applied to systems of economic importance or importance to sustainable agriculture.

# Biology of Plant-Microbe Associations

## Program Statistics – FY 2007

- # of Proposals Submitted: 65
- # of Proposals Funded: 21
- % Success: 26% overall; 24% standard proposals
- Average Award Size: \$375,750 (not including conferences, equipment, seed, research career enhancement or postdoc)
- Average Award Duration: 37 months for Standard Awards

# Microbial Genomics (B): Functional Genomics

## National Program Leader: Ann Lichens-Park

[apark@csrees.usda.gov](mailto:apark@csrees.usda.gov)

### Program Goals

- Increase ability to manipulate microbes for the benefit of U.S. agriculture
- Faster, more accurate and cost-effective detection and diagnosis of plant and animal pathogens
- Improved methods of managing plant and animal pathogens

### Program Priorities

- Characterization of microbial mechanisms of pathogenicity
- Characterization of mechanisms of non-pathogenic interactions between microbes or between microbes and their hosts
- Characterization of mechanisms used by microbes to survive or respond to environmental change

## **Microbial Genomics (B): Functional Genomics**

- Applications must characterize on a large scale genes or networks of genes in a microbe having a **completely or nearly completely sequenced genome.**
- Microbe must be of importance to U.S. agriculture
- Projects are expected to utilize current and emerging **high-throughput technologies**
- Anticipated Program budget for FY 07 is \$6 million

# Microbial Genomics (B): Functional Genomics Program Statistics – FY 2005

- # of Proposals Submitted: 25 Standard
- # of Proposals Awarded: 5
- % Success: 20
- Average Standard Award Size: \$725,000
- Average Award Duration (months): 34

# NSF/CSREES

## Microbial Genome Sequencing Program

National Program Leaders: Ann Lichens-Park: [apark@csrees.usda.gov](mailto:apark@csrees.usda.gov)

Daniel Jones: [djones@csrees.usda.gov](mailto:djones@csrees.usda.gov)

### **FY 07 Program Goals**

- High-throughput sequencing of the genomes of viruses, bacteria, archaea, fungi, oomycetes, protists and agriculturally important nematodes
- Development and implementation of strategies, tools and technologies to make currently available genome sequences more valuable to the user community

### **FY 07 Program Priorities**

#### **Microbes must be:**

- of fundamental biological interest
- of national interest (e.g. homeland security)
- important to the productivity and sustainability of agriculture and natural resources
- important to the safety and quality of the nation's food supply

# NSF/CSREES

## Microbial Genome Sequencing Program

### Program Statistics – FY 2007

- # of Proposals Submitted: 73 Standard
- # of Proposals Awarded: 16 Standard  
(4 CSREES, 11 NSF, and 1 both NSF & CSREES)
- % Success: 22%
- Average CSREES Award Size: \$1,000,000
- Average CSREES Award Duration (months): 29

# **NSF/CSREES Interagency Program Microbial Observatories (MO) and Microbial Interactions and Processes (MIP)**

National Program Leader / Program Director:  
John L. Sherwood [jsherwood@csrees.usda.gov](mailto:jsherwood@csrees.usda.gov)  
Matt Kane [mkane@nsf.gov](mailto:mkane@nsf.gov)

**Goals / Priorities** – (Due date 10/08/07)

See: [www.nsf.gov](http://www.nsf.gov), NSF 05-0600 for RFA  
(CSREES will only support MO projects)

- 1) Discovery of undescribed microbes and microbial consortia in diverse habitats
- 2) Characterization of novel biochemical, metabolic, physiological, genomic, and other properties and processes in these consortia and communities

# No Significant Changes for FY07

Proposals might address, *but are not limited to*:

- Properties and mechanisms responsible for microbial growth, adaptation and survival in natural and managed environments;
- Mechanistic basis of interactions among microbes;
- Microbial processes for flow of energy and cycling of nutrients in different environments;
- Studies that characterize the microbial diversity and composition of microbial communities associated with healthy and diseased hosts or different management systems;
- Patterns of microbial distribution in time and space

Genomics, functional genomics and proteomics approaches to these studies are encouraged.

USDA-CSREES relevant awards: \$2 million

# Funding Stats. and Proposal Process

(FY06 was 1<sup>st</sup> yr. for CSREES partnership)

- Proposals are submitted to NSF (FY06,n=74; FY07,n=72)
- All MO proposals reviewed by one panel. MIP proposals are a separate panel. MO success rate approx. 10%. Average award size \$1.05 million for proposals supported by USDA-CSREES.
- Highly ranked proposals relevant to CSREES mission are supported by CSREES alone or w/ NSF. If awarded, PI submits proposal with CSREES forms for processing.
  1. CSREES duration limited to 4 years.
  2. Abstracts of awardees for FY06 and FY07

Go to: <http://cris.csrees.usda.gov/>

**NSF has yet to commit for a joint program in FY08**

# Plant Biosecurity Program

Liang-Shiou Lin, [lilin@csrees.usda.gov](mailto:lilin@csrees.usda.gov)

John L. Sherwood, [jsherwood@csrees.usda.gov](mailto:jsherwood@csrees.usda.gov)

## Goals

- Provide the understanding and technologies to mitigate threats to the Nation's agricultural plant production systems
- Provide decision makers and responders the knowledge and tools to cope with high-consequence plant pathogens
- Enable strategies for control and elimination of high-risk plant pathogens

# Priorities for FY 2008

- 1) Development of rapid detection/diagnostic procedures that build on genomic sequences as available to facilitate monitoring and mitigation of plant pathogens and arthropods of high consequence and importance. The application must contain a compelling case for the proposed work relative to plant biosecurity. See RFA for additional information.
- 2) Monitoring and mitigation of diseases caused by high consequence plant pathogens and arthropods through extension / education programs to implement strategies resulting from, or developed in conjunction with, etiological and epidemiological investigations. The application must contain a compelling case for the proposed work relative to plant biosecurity. See RFA for additional information.

# **Significant Changes**

1. **Program Scope Broadened.** Based on community input, the program does not identify specific taxa. The PI identifies and supports basis of pathogen / arthropod being of high consequence.
2. **Letter of Intent Required.** March 14, 2008. See RFA for submission directions.
3. **Parameters of “relative to plant biosecurity” defined in RFA.** Be sure proposal addresses.

**Not new, but a reminder:**

**Only integrated projects supported that must include research, education, and extension / outreach objectives (at least 2 of 3).**

# Funding Statistics: Plant Biosecurity

	<b>FY 2003</b>	<b>FY 2004</b>	<b>FY2005</b>	<b>FY2006</b>
No. of Awards / No. submitted	8 / 40	6 / 27	6 / 30	3 / 12
% success	20	22	20	25
<b>Funding Distribution</b>				
Avg (all years) = \$709,227; nearly all 3-4 yr duration Range: \$50,000 to \$1,746,937				

**(FY 2007 proposals currently being processed)**

Program will likely continue at \$4 million for the FY

Maximum request = \$1,000,000

Letter of intent = March 14, 2008

Application Deadline = June 5, 2008