



**USDA Cooperative State Research, Education and Extension Service (CSREES) Stakeholders
Workshop on Plant and Pest Biology - November 20, 2007**

Presenter: Charles W. Rice, Ph.D., Kansas State University

The American Society for Microbiology (ASM) is the largest single life science organization in the world, with more than 42,000 members who work in academic, industrial, medical, and governmental institutions. The ASM's mission is to enhance the science of microbiology, to gain a better understanding of life processes, and to promote the application of this knowledge for improved health and environmental well-being.

Agriculture's role in society has expanded and understanding of all steps in the process of plant and animal production, soil and water management, and harvesting, storage and processing of agricultural products is necessary. Microbes and their activities are present at each step in the process, and microbial research can help USDA meet the six CSREES Strategic Goals: 1) Enhance International Competitiveness of American Agriculture; 2) Enhance the Competitiveness and Sustainability of Rural and Farm Economies; 3) Support Increased Economic Opportunities and Improved Quality of Life in Rural America; 4) Enhance Protection and Safety of the Nation's Agriculture and Food Supply; 5) Improve the Nation's Nutrition and Health; and 6) Protect and Enhance the Nation's Natural Resource Base and Environment.

Research Priorities

In order to remain competitive in the world market, adapt to climate change and challenges of land and water use, agriculture must continue to innovate. Below are recommendations to foster innovation and accomplish the above goals:

- Study the impact of production and processing practices, land use, and climate change on microbial evolution, persistence and resistance in animal, plant and the environment.
- Apply a systems biology approach to understanding microbial communities in the agricultural production system, long-term projects and multi-disciplinary research in food and agricultural microbiology.
- Pursue multidisciplinary strategies for developing knowledge and technologies to meet the food and agriculture problems.
- Study microbe interactions and processes in the biofuel development process from production of feedstock to fermentation and subsequent waste disposal.
- Develop a deeper understanding of the nature, specificity and adaptation of microbes to animals, plants, food environments and humans; and host responses to both pathogenic and beneficial organisms.
- Use comparative pathobiology to understand the means of transmission of pathogens from animal or plants to humans, and vice versa.
- Study the impact and interactions of invasive plant species and microorganisms on ecosystem function, and to devise appropriate interventions.
- Provide educational initiatives to supply adequately trained researchers in the food and agricultural communities.

Increased investment in the field of agricultural research is necessary, just as the challenges the nation faces in competitiveness, food safety, energy, and climate change, place more emphasis on the need to answer these demands. Microbiology research is an essential component to sustaining and improving production, food safety, alternative energy sources, and environmental quality. USDA must aggressively seek funding and identify opportunities and needs to facilitate these issues.