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## Executive Summary

### ***The Need for a Coordinated Federal Effort in Microbial Genomics***

Microorganisms have been present for over 3.8 billion years; we have known about their existence for over 300 years. Yet, despite the fact that microbes comprise most of the earth's biomass, maintain its environments, and hold the key both to understanding the history and health of life on Earth and to exploiting the full potential of biotechnology for myriad applications, we still know almost nothing about most of them. Now, with the advent of genomics, we are entering a new era of scientific discovery. Recognizing the broad importance of microbial genomics research, in 1999 an interagency task group conducted an informal inventory of Federally-supported research in microbial genomics. While it is clear that genomics offers unprecedented opportunities, this inventory showed that there are major areas of research as yet untouched that would increase our understanding of the broader microbial world, its diversity, and its potential applications. A coordinated interagency (and international) effort is needed to seize the opportunities offered by genome-enabled microbial science. In recognition of this need, the Microbe Project Interagency Working Group was convened in August 2000, and charged with developing a coordinated interagency action plan for microbial genomics activities.

### ***Goals of the Coordinated Effort***

The Microbe Project has three broad goals: to build needed infrastructure, to promote research, and to develop human resources and an informed public.

- The three major components of infrastructure needed to support microbial genomics research are 1) genome sequences, 2) tools, technologies and biological resources, and 3) databases and bioinformatics.
- Genome-enabled microbial research holds enormous promise for understanding life at its most basic level, and for enabling breakthrough applications in health, agriculture, biotechnology, the environment, and national defense.
- The education and training of students, scientists, and the public in genome-enabled microbial biology, and assuring a diversity of participants in this area, is essential.

### ***Recommendations***

- Microbial genome sequencing should be expanded to include scientifically important but as yet understudied microbes.
- Individual agencies should continue or, as necessary, increase support for research on technique and tool development.
- The Federal government should initiate a deliberate planning effort to address the issue of providing sustained support for and access to microbial genomic resources.
- Develop standardized bioinformatics tools for the analysis of microbial genomes.
- Database issues (including standardized annotation, inter-operability, and long term support) must be resolved through an interagency effort with planning activities to begin immediately.
- Each agency, as its mission directs, should encourage and support genome-enabled microbial research objectives, as described in this report.
- Individual and interagency activities initiated as part of the Microbe Project should contain elements that encourage training and/or educational activities, and include efforts to enhance the diversity of participants in all aspects of each activity. Interagency coordination of the development and distribution of training materials should be encouraged.
- Continue coordination across agencies of all Microbe Project activities, in part through the development of an interagency Microbe Project web site.