

DOE/SC-0090

DOE GENOMICS:GTL ROADMAP



**SYSTEMS BIOLOGY
FOR ENERGY AND
ENVIRONMENT**

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Office of Biological and Environmental Research
and
Office of Advanced Scientific Computing Research



DOEGenomesToLife.org



Genomics:GTL Programmatic Background

The Department of Energy's (DOE) Office of Science (SC) plays four key roles in U.S. research:

- Contributes essential scientific foundations to DOE's national energy and economic security missions;
- Invests in research at more than 280 universities, 15 national laboratories, and many international institutions;
- Builds and operates major research facilities for open access by the science community; and
- Supports core capabilities, theories, experiments, and simulations at the extreme limits of science.

An SC goal for its Office of Biological and Environmental Research (BER) is to "harness the power of our living world and provide the biological and environmental discoveries necessary to clean and protect our environment and offer new energy alternatives" [*Office of Science Strategic Plan* (2004)].

To address this priority, BER and SC's Office of Advanced Scientific Computing Research (OASCR) are sponsoring the Genomics:GTL program. Established in 2002, GTL uses microbial genome data to launch investigations of microbes with capabilities relevant to DOE energy and environmental missions. The GTL scientific program was developed with input from hundreds of scientists from universities, private industry, other federal agencies, and DOE national laboratories. Many genome sequences used in GTL and determined by BER programs have made important contributions to the understanding of biology, genetics, and evolution.

Scientific and technological progress during the Human Genome Project, initiated in 1986 by DOE, provides the foundation for GTL research.

SC's goal for OASCR is to deliver computing for the frontiers of science. OASCR's primary missions are to discover, develop, and deploy integrated computational and networking tools that enable researchers in scientific disciplines to analyze, model, simulate, and predict complex phenomena important to DOE. To this end, OASCR fosters and supports fundamental research in advanced scientific computing—applied mathematics, computer science, and networking—and operates supercomputer, networking, and related facilities. OASCR's leadership will be critical to GTL's success.

To aid program progress, GTL is in the process of populating its web site with such communications resources as research in progress, image galleries, presentations, fact sheets, topical web pages, and meeting calendars. Feedback and other interactions are welcome to assist in the development of dynamic, next-generation web tools for educational purposes and to facilitate the research of diverse scientific contributors and users of GTL resources and data.

Visit the roadmap web site for electronic download of this publication and its graphical content. To order hardcopies or submit comments, call or use the web:

- doegenomestolife.org/roadmap/
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