Fungal Genomics Program

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ABSTRACT

Doubling the number of sequenced and annotated genomes every year, the JGI Fungal Program (jgi.doe.gov/fungi) is moving towards the new large scale initiatives aligned with the 2010 Grand Challenges for Biological and Environmental Research: a long term vision. One of the initiatives, the 1000 Fungal Genomes project, is aimed to explore fungal diversity across the Fungal Tree of Life in order to provide references for research on plant-microbe interactions and environmental metagenomics. Another initiative, the Genomic Encyclopedia of Fungi, is focused on diversity among DOE relevant fungi in the areas of plant health and biorefinery parts lists, which will help us to explore the interactions of bioenergy crop species with symbionts and pathogens as well as to catalog industrially relevant genes, pathways, and hosts for biotechnology applications. In addition to broad exploration of fungal diversity, we will also focus on the functional analysis of several fungal systems of varying complexity: new model organisms, symbiotic systems such as lichens, and metagenomes of complex communities.
The JGI Fungal Genomics Program aims to scale up sequencing and analysis of fungal genomes to explore the diversity of fungi important for energy and the environment, and to promote functional studies on a system level. Combining new sequencing technologies and comparative genomics tools, JGI is now leading the world in fungal genome sequencing and analysis. Over 120 sequenced fungal genomes with analytical tools are available via MycoCosm, a web portal for fungal biologists. Our model of interacting with user communities, unique among other sequencing centers, helps organize these communities, improves genome annotation and analysis work, and facilitates new larger-scale genomic projects. This resulted in 20 high-profile papers published in 2011 alone and contributing to the Genomics Encyclopedia of Fungi, which targets fungi related to plant health (symbionts, pathogens, and biocontrol agents) and biorefinery processes (cellulose degradation, sugar fermentation, industrial hosts). Our next grand projects. This resulted in 20 high-profile papers published in 2011 alone and contributing to the Genomics Encyclopedia of Fungi, which targets fungi related to plant health (symbionts, pathogens, and biocontrol agents) and biorefinery processes (cellulose degradation, sugar fermentation, industrial hosts). Our next grand projects.