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Title

JGI Fungal Genomics Program

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JGI Fungal Genomics Program

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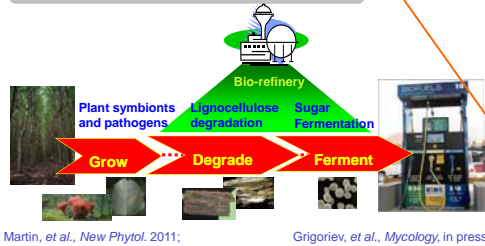
Abstract

Genomes of energy and environment fungi are in focus of the Fungal Genomic Program at the US Department of Energy Joint Genome Institute (JGI). Its key project, the Genomics Encyclopedia of Fungi, targets fungi related to plant health (symbionts, pathogens, and biocontrol agents) and biorefinery processes (cellulose degradation, sugar fermentation, industrial hosts), and explores fungal diversity by means of genome sequencing and analysis. Over 60 fungal genomes have been sequenced by JGI to date and released through MycoCosm (www.jgi.doe.gov/fungi), a fungal web-portal, which integrates sequence and functional data with genome analysis tools for user community. Sequence analysis supported by functional genomics leads to developing parts list for complex systems ranging from ecosystems of biofuel crops to biorefineries. Recent examples of such 'parts' suggested by comparative genomics and functional analysis in these areas are presented here.

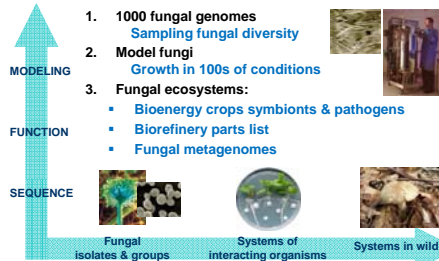
Genomic Encyclopedia of Fungi

- Plant Feedstock Health
- Biorefinery
- Fungal Diversity

Energy & Environment Fungi

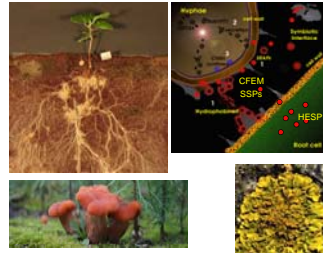


Future Grand Challenges



Plant Health

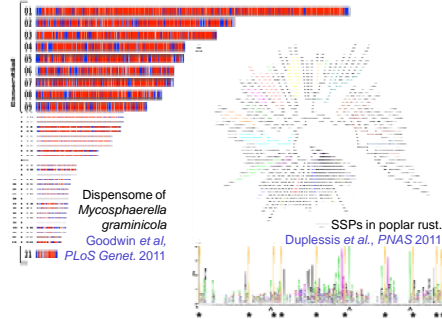
Symbionts



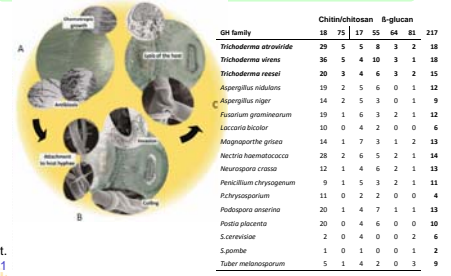
Laccaria bicolor:
Ectomycorrhizal symbiont of poplar.
Martin et al., *Nature* 2008

Xanthoria parietina:
lichen fungus (Pt: Paul Dyer)

Plant Pathogens



Biocontrol

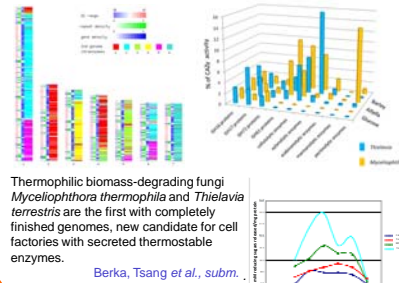


Integrated genomic and transcriptomic analysis reveals mycoparasitism as the ancestral life style of *Trichoderma*.

Kubicek et al., *Genome Biol.* 2011;
Druzhinina et al., *Nature Microbiol Rev.*, in press

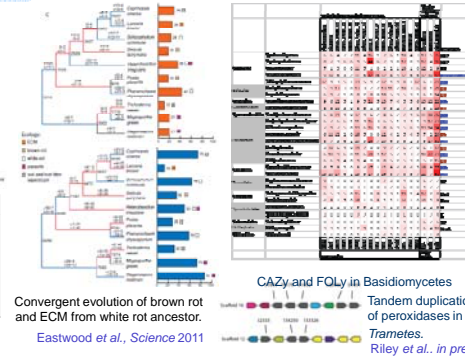
Biorefinery

Thermophiles

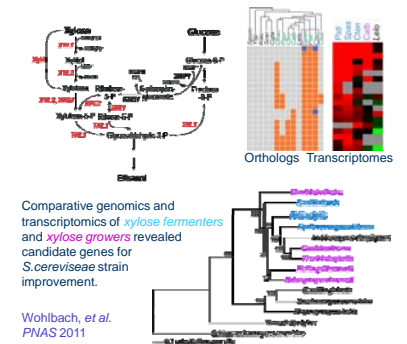


Release of reducing sugars from alfalfa straw by extracellular enzymes

Lignocellulose Degradation

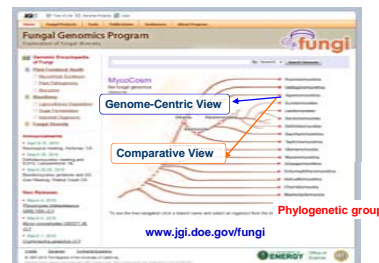


Xylose Fermenters



Fungal Diversity

MycoCosm: 80+ fungal genomes



Genome-centric View

Supports genome analysis, functional genomics, user data deposition & curation



Comparative View

Enables analysis of groups of related fungi

