

Fueling the Future with Fungal Genomes

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Fueling the Future with Fungal Genomics

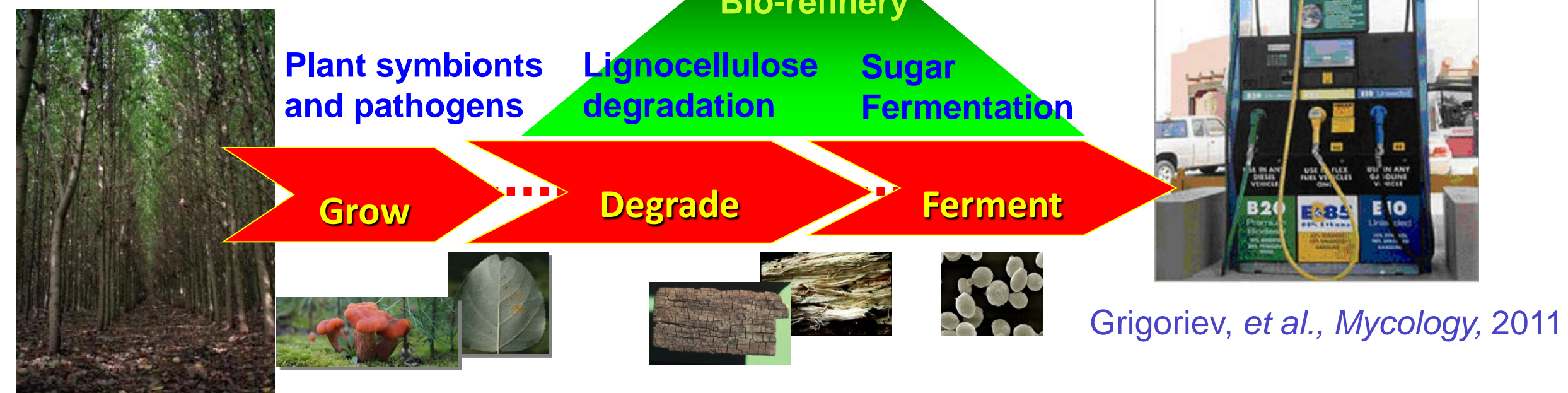
Igor V. Grigoriev, DOE Joint Genome Institute



Abstract

Genomes of fungi relevant to energy and environment are in focus of the JGI Fungal Genomic Program. One of its projects, the Genomics Encyclopedia of Fungi, targets fungi related to plant health (symbionts and pathogens) and biorefinery processes (cellulose degradation and sugar fermentation) by means of genome sequencing and analysis. New chapters of the Encyclopedia can be opened with user proposals to the JGI Community Science Program (CSP). Another JGI project, the 1000 fungal genomes, explores fungal diversity on genome level at scale and is open for users to nominate new species for sequencing. Over 400 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 will lead 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.

Fungi for Energy

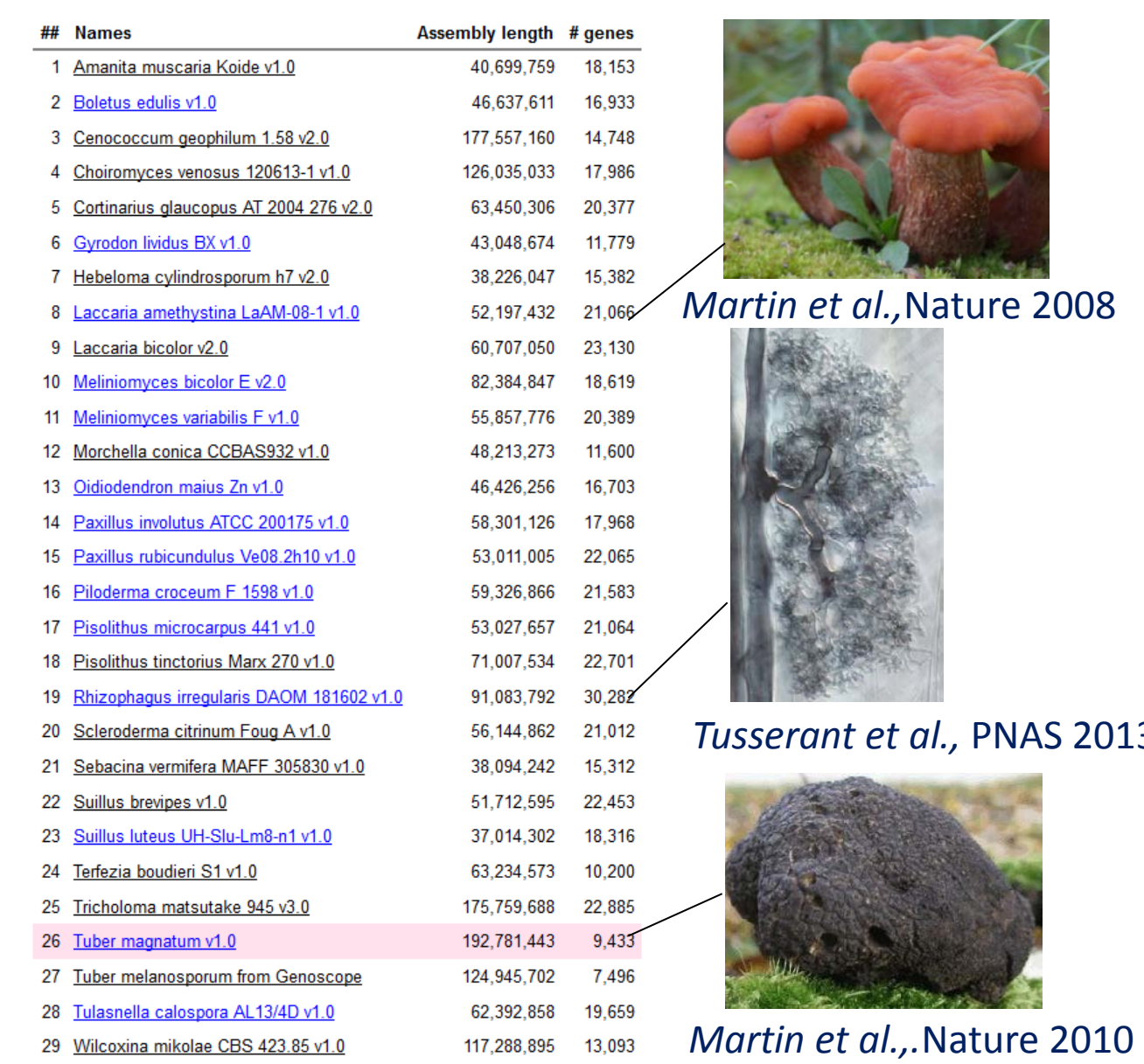


Fungal System Biology



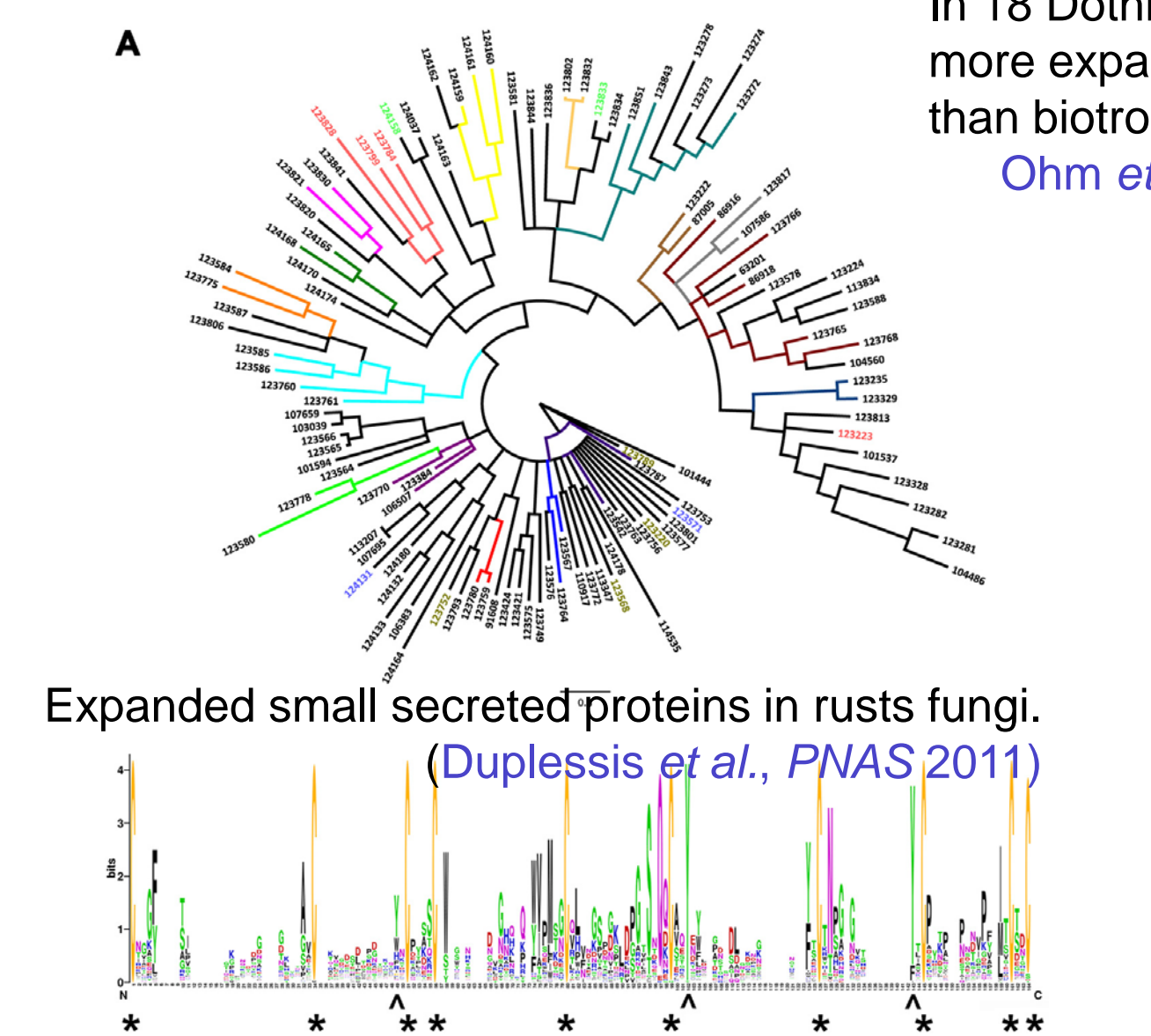
Mycorrhizal Symbionts

http://genome.jgi.doe.gov/Mycorrhizal_fungi

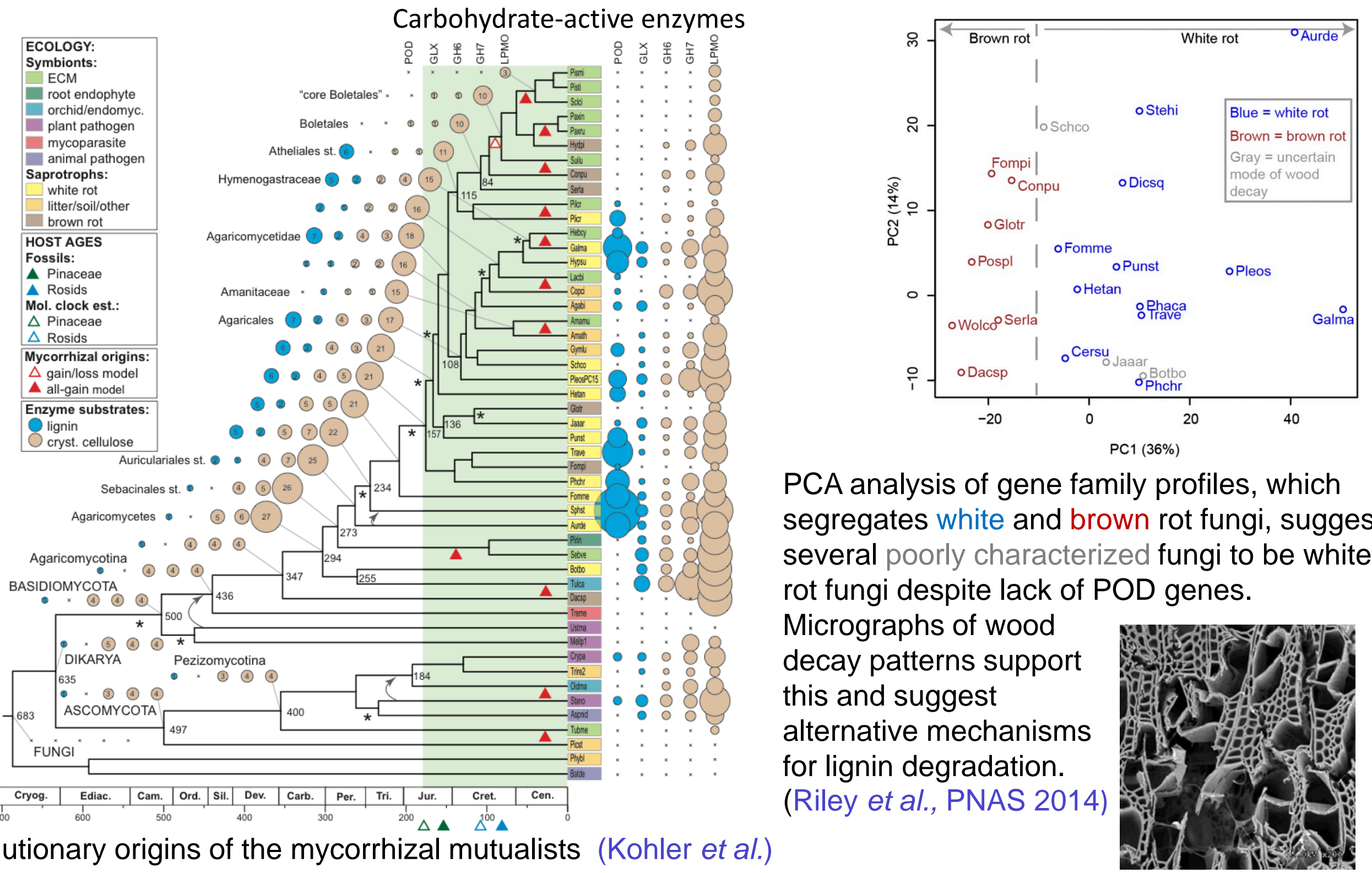


Mycorrhizal Genomics Initiative open doors for analysis of convergent evolution (Martin et al. CSP11)

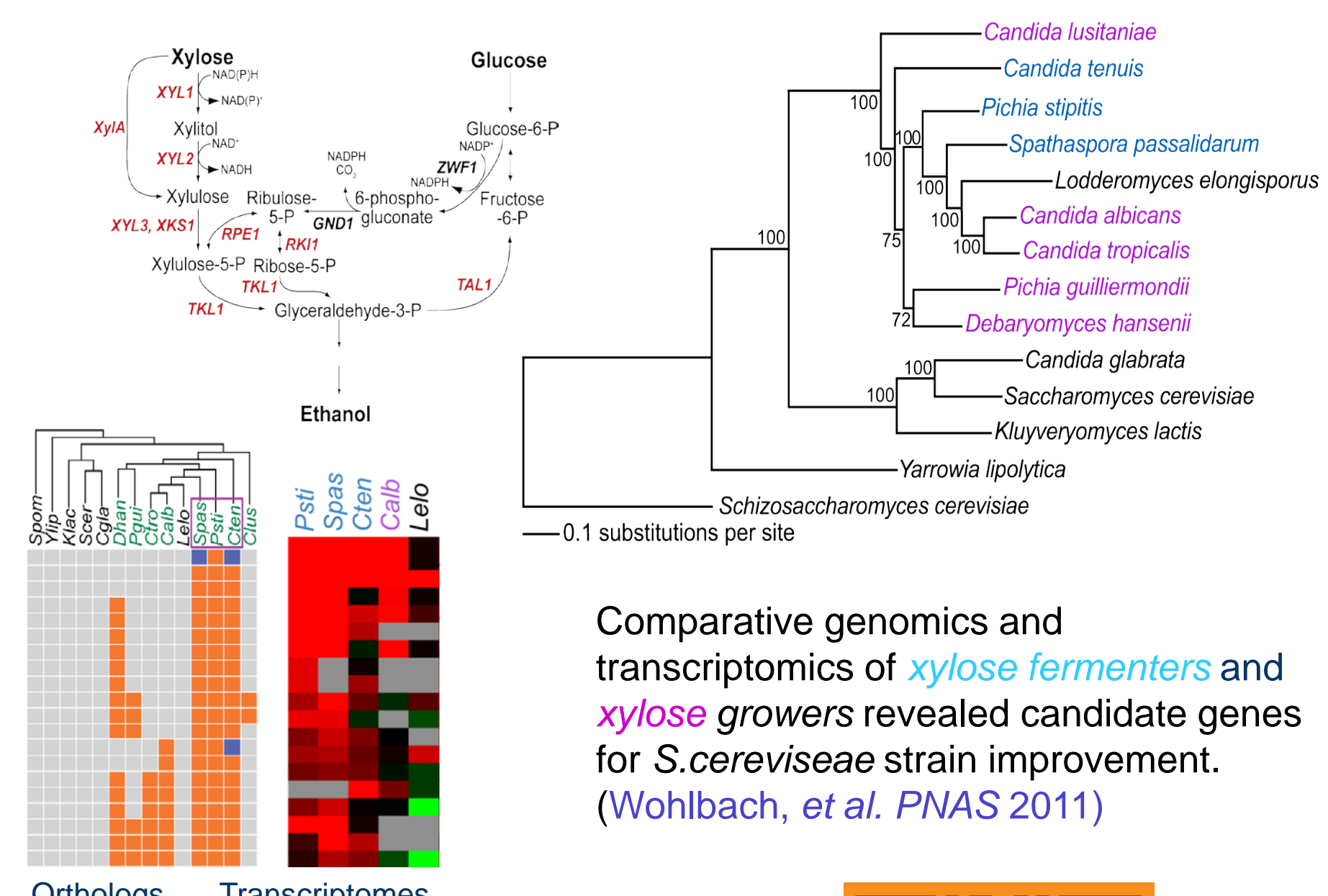
Plant Pathogens



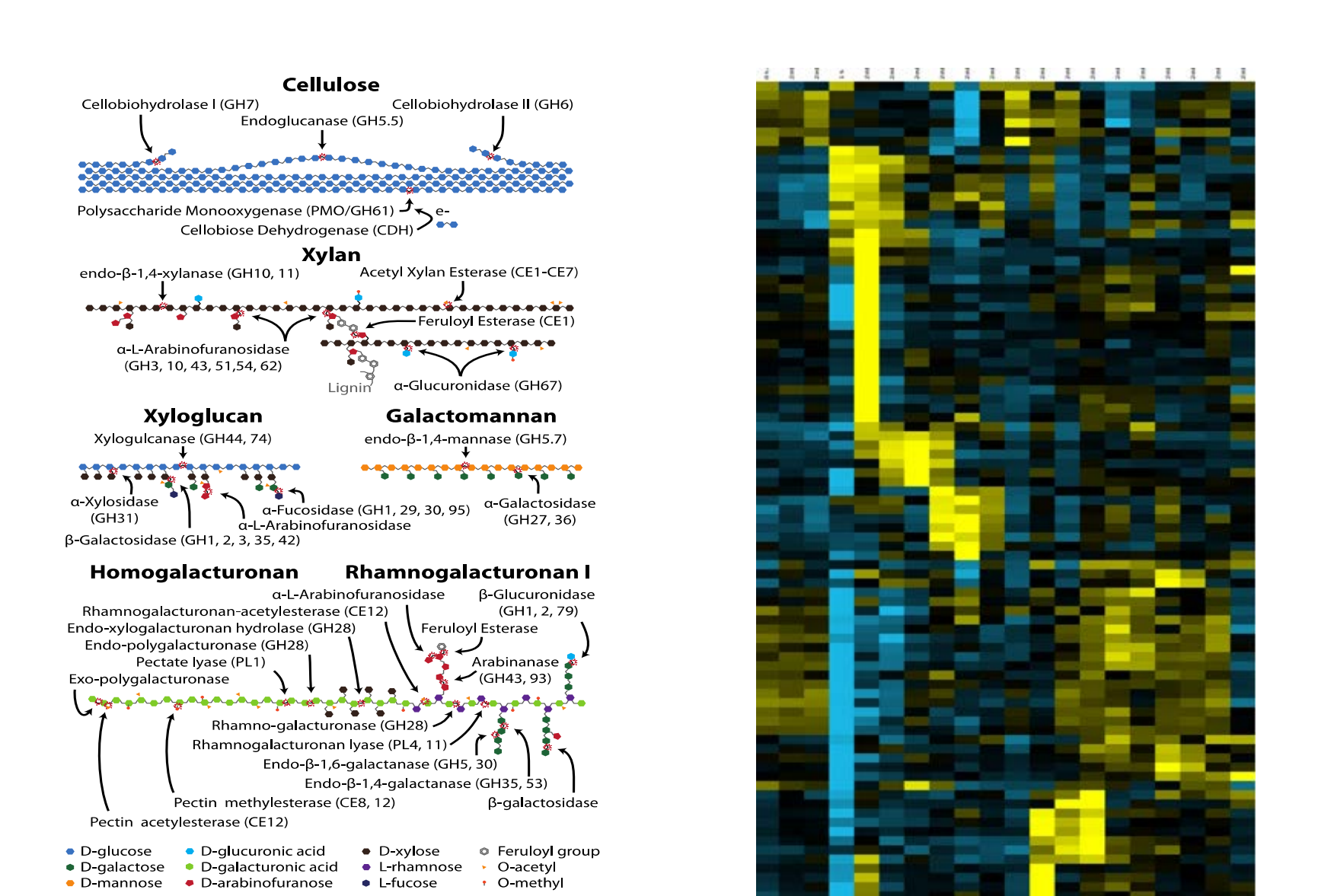
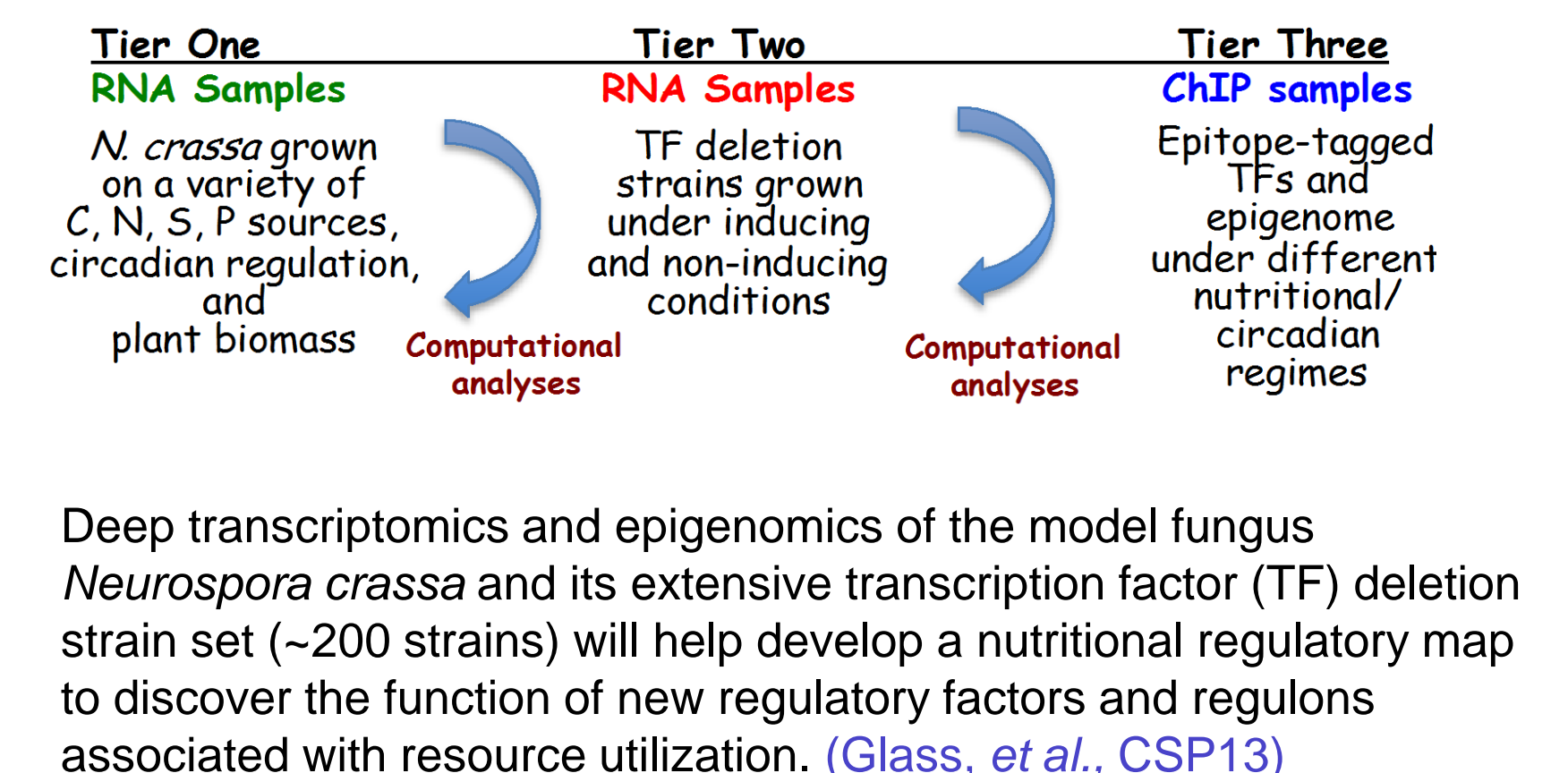
Wood Decayers



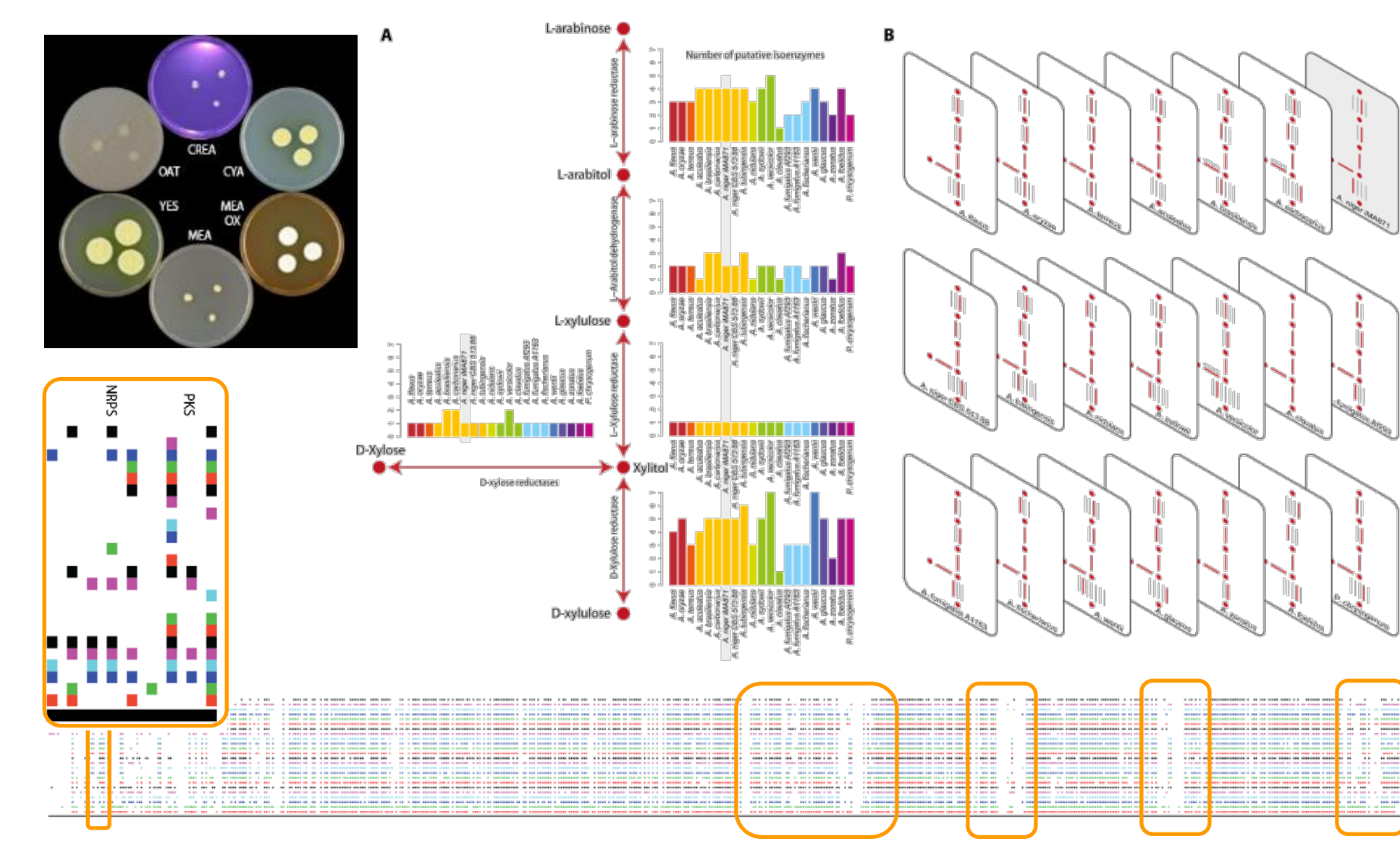
Xylose Fermenters



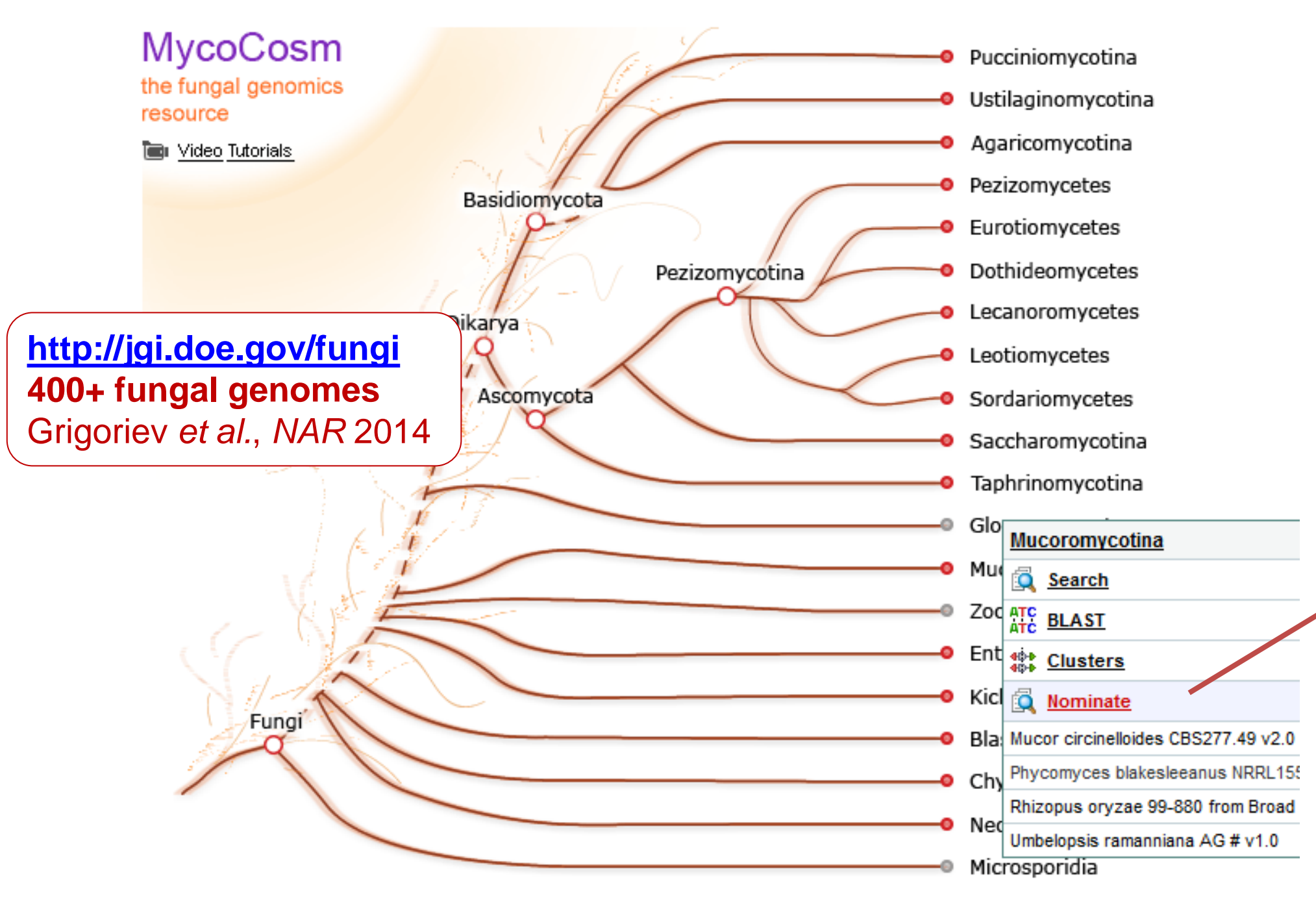
Fungal Nutritional ENCODE



Aspergillus Deep Sequencing



MycoCosm



1000 Fungal Genomes Project

Step 1: Login

Sequencing 1000 fungal genomes from across the Fungal Tree of Life will provide references for research on plant-microbe interactions and environmental metagenomics. (Spatofora et al., CSP12.)

Step 2: Nominate new species

Nominate new species for sequencing for families of Fungi with no sequenced genomes!

Step 3: Prepare DNA and RNA samples