

***sDiv Workshop***  
**“3<sup>rd</sup> Mycorrhizal Genomics Initiative (MGI)”**  
**09.-10.07.2013**  
**Workshop Summary**

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## Summary

From 9th to 10th of July 2013, François Buscot (UFZ-iDiv) and Francis Martin (INRA Nancy, France) organised an sDiv workshop on genomics of mycorrhizal symbiosis. This workshop invited some 30 participants from North-America, Europe but also from the Middle-East. Most of them are members of the “Mycorrhizal Genome Initiative” (MGI), an ongoing research program coordinated jointly by INRA (France) and DOE Joint Genome Institute (California) to sequence the genomes and the symbiotic transcriptomes of 25 fungal species living in mycorrhizal symbiosis with plant roots (<http://mycor.nancy.inra.fr/IMGC/MycoGenomes/>). The main objective of the MGI is to understand the origin and the functional diversity of mycorrhiza, symbiotic interaction that emerged independently within distinct fungal lineages since the onset of terrestrial habitat colonization by plants some 560 M years ago.

The sDiv workshop that was held at the Leipzig BioCity, the actual house of iDiv, took place at a time point where sequencing of most of the selected fungi was achieved and synthesis of the results for a high rank publication and a wealth of more detailed papers were on the agenda. Discussions were on annotation strategies and on defining lines and architectures for common publications. Obviously, acquisition of the mycorrhizal trait in fungi corresponds to both a loss of genes related to degradation of complex plant cell wall polymers and a gain of genes encoding small secreted proteins acting as effectors to control genome expression of the plant partners. The goal of the synthesis is to clarify which genetic adaptations are common, and which are unique, to the different fungal lineages that switched to the mycorrhizal lifestyle independently from each other and thus to disentangle the functional diversity of mycorrhizal symbioses. With other words, is mycorrhiza a unique organ with recognizable general features or a repeated and diverse success story?

## Program-Presentations

The goal of the meeting was to establish the current status of the mycorrhizal genome projects to bring the teams of the consortium together for a discussion of the most recent findings.

Therefore we started the workshop in a presentation of the actual project status about the exploration of the genome diversity of mycorrhizal fungi by F. Martin which was completed by an update presentation of the MycoCosm Database & Fungal Genomics at JGI by I. Grigoriev. After these general informations, specific presentations followed dealing with “Identifying transposable elements and other repeated elements in mycorrhizal genomes” (C Murat,), “Phylogenomics of mycorrhizal species

and the fate of decay-related gene families in mycorrhizal genomes (L.G. Nagy), Analysis of multigene families and duplications in mycorrhizal genomes (E Morin), Secretome (incl. CAZYmes) in mycorrhizal species (C Fourrey). New results on the ectomycorrhizal fungi *Paxillus involutus*, *P. rubicundulus* *Hebeloma cylindrosporium*, *Amanita muscaria*, *A. thiersii*, *Piloderma croceum*: *Suillus luteus*, *Pisolithus tinctorius*, *P. microcarpus*, *Sebacina vermifera*, *Tulasnella calospora*, *Cenococcum geophilum*, *Oidiodendron maius*, *Meliniomyces bicolor*, *M. variabilis*, *Tuber* species were presented by different members of the consortium in further 12 short presentations.

Finally F. Martin presented new mycorrhizal two genome projects dealing with "Metatranscriptomics of Forest Soil Ecosystems" and "Exploration of the Symbiotic Transcriptomes"

## Outlook

In a conclusive discussion the major goals of a master publication dealing with symbiosis-related gene families, gene families encoding enzymes involved in wood decay, and gene diversification relative to evolution of woody plants were presented. Actually the first draft of the master paper is under construction, and it will be circulated in the consortium in the next weeks. In addition outlines of companion papers for a special issue in the *New Phytologist* have been submitted to F. Martin.

The follow-up 4th Mycorrhizal Genomics Initiative (MGI) Workshop will be held in Sevilla (Spain): on March 27th, 2014 as a satellite meeting of the 12th European Conference on Fungal Genetics (ECFG12).

## Greetings

The participants were extremely grateful to iDiv, for the great hospitality and the financial support of sDiv, which contributed to the success of the 3rd MGI workshop.

## Participants

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