Comparative Genomics of Mycorrhizal Symbiosis and Wood Decay in Forest Ecosystems

Igor Grigoriev¹, Francis Martin²

¹ US Department of Energy Joint Genome Institute/ Lawrence Berkeley National Laboratory (USA)
² Institut National del la Recherche Agronomique (INRA-Nancy, France)

May 2014

The work conducted by the U.S. Department of Energy Joint Genome Institute is supported by the Office of Science of the U.S. Department of Energy under Contract No. DE-AC02-05CH11231

DISCLAIMER

This document was prepared as an account of work sponsored by the United States Government. While this document is believed to contain correct information, neither the United States Government nor any agency thereof, nor The Regents of the University of California, nor any of their employees, makes any warranty, express or implied, or assumes any legal responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by its trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof, or The Regents of the University of California. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof or The Regents of the University of California.
Forests, very important and complex ecosystems, depend on tree-microbial associations above and below ground. Understanding molecular mechanisms of associations between trees and fungi in forests requires a novel, community-driven, multi-disciplinary approach based on genomics and ecological and data tools. Here we propose a three-way approach to strengthen collaboration between our institutions, LBNL and INRA, and with a larger scientific community on exploration of associations between trees and fungi in forests to create a basis for understanding forest ecology and management strategies.

1. Strengthen collaboration between INRA and JGI (LBNL) in analysis of multi-dimensional datasets on tree-microbial interactions within the context of forest ecology and management. Establish regular communication and working visits to exchange data and tools, experimental and computational techniques, and general expertise developed in each laboratory. Collaboration between these two leading institutions will facilitate interactions between larger scientific communities on both sides of the Atlantic Ocean.

2. Organize, coordinate, and attend several workshops to maximize the number of interactions and design of future experiments. Training abroad will facilitate exchange of younger researchers from both laboratories to participate in the framework of forest ecosystems, its microbial components, and mechanisms of interactions with plants. Support younger researchers from different disciplines to develop new resources and strategies to exchange data and tools, experimental and computational techniques, and general expertise developed in each laboratory. Collaboration between these two leading institutions will facilitate interactions between larger scientific communities on both sides of the Atlantic Ocean.

3. Provide training opportunities and support for young researchers in both groups to learn new techniques developed at partner labs, to explore new research environments, and develop new collaborations for better interpretation of data and design of future experiments. Training abroad will facilitate exchange of different approaches offered by American and European scientific schools.