Fisher Award Recipient:

Dr. Étienne Yergeau, INRS-Institut Armand Frappier, Laval, QC

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Étienne Yergeau completed is B.Sc. in biological sciences with a spcialization in plant biology and biotechnology at the Universtié de Montréal in 2002. He then obtained M.Sc under the supervision of Marc St-Arnaud at the Université de Montréal for his research on the fungal diseases of asparagus. He then joined the team of George Kowalchuk in the Netherlands where he obtained his Ph.D. from the Free University of Amsterdam in 2008 for his thesis on the consequences of global warming on Antarctic soil microorganisms. Étienne then joined the team of Charles Greer as a postdoctoral fellow and worked on the microorganisms involved in the remediation of contaminated soils. In 2013, he was recruited as a research scientist by the National Research Council of Canada. He then joined the faculty of the Centre INRS-Institut Armand-Frappier in January 2016. The vision of "Le Labo Yergeau" is that the plant microbiota can be reengineered to promote specific plant phenotypes, potentially generating solutions to many real-life problems like climate change, contaminated soils and declining food production. In the mid-term, the research program of “Le Labo Yergeau” aim at finding new approaches to purposefully, reliably, and sustainably enhance the beneficial microbiota of important crops.

Understanding and manipulating the plant holobiont

Étienne YERGEAU, INRS-Institut Armand Frappier, Laval, Quebec

Plants and their microbiota form and inseparable entity known as a holobiont. The concept of the hologenome (all the genomes of the holobiont) as an evolutionary unit suggests mechanisms that could be harnessed to rapidly evolve/adapt holobionts. For this presentation, I will discuss recent studies that aimed at understanding and manipulating the microbial part of the plant holobiont. More specifically, I will: 1) compare the capacity of various plant genotypes to recruit beneficial microorganisms under stressful conditions, 2) contrast the effects of the plant genotype and the environment on the stress response and 3) show that manipulating the microbiota can modify the phenotype of the host plant. Globally, my research shows that it is possible to modify the plant holobiont through microbiota manipulation, highlighting the central role of microbes in plant phenotypic plasticity. More research will be however necessary to completely understand the mechanisms involved and apply them for e.g. increase crop yields.