Expression of interest: PhD project in plant-microbiome interactions

Plant-microbe interactions are central to key ecosystem services such as agricultural production and nutrient cycling. However, most of what is known about these interactions are restricted to the effects of a small number of bacteria and fungi that are amenable to cultivation[1], while the role of most microorganisms associated with plants remains poorly understood. Advancements in DNA sequencing over the last decade have dramatically increased our capacity to analyse diverse microbial communities, opening an exciting opportunity to investigate the role of the huge pool of uncultured microbes in plant biology. Increasingly, the microbial communities living in close association with the plant (i.e. the rhizosphere, endosphere and phyllosphere microbiomes) are thought to have co-evolved with their plant partners, acting as an extra-organismal extension of the plant genome and promoting greater environmental adaptability, resource acquisition, and defence[2,3]. Strategies to influence the plant microbiome could therefore be added to the plant-management toolbox for improving crop performance in agriculture.

This project will investigate how shifts in the plant microbiome diversity affect plant phenotypes, as well as the role of specific plant genes on plant-microbe interactions. To achieve this, this project will have access to the plant genetic model system *Arabidopsis thaliana*, a powerful and well-characterised system that allows detailed analyses of plant genetics, epigenetics and metabolism. The project will be based in the Plant & AgriBiosciences Research Centre at NUI Galway and will be led by Dr. Alexandre de Menezes, in collaboration with Prof. Charles Spillane.

This project is suited to students with interests in microbiology, plant genetics, molecular biology and crop science. Experience or willingness to work with bioinformatics in Linux and statistics in R is essential.

Prospective students are advised to contact the supervisory team to discuss applications to the Irish Research Council (http://www.research.ie/funding/postgraduate-funding) and for the NUI Galway Hardiman Scholarships (http://www.nuigalway.ie/hardiman-scholarships/).

This position is open to EU students. Prospective non-EU students are advised to enquire about potential funding opportunities.

Please contact ASAP for applications to NUI Galway Hardiman Scholarships and prior to 1 of September 2017 for IRC Postgraduate Scholarships. For further information, contact alexandre.demenezes@nuigalway.ie.

Website: www.plantagbiosciences.org

1 van der Heijden (2008) *Ecology Letters* **11**, 296-310;
2 Lapsansky (2016) *Curr Opin Biotech* **38**, 137-142;
3 Vandenkoornhuyse (2015) *New Phytologist* **206**, 1196-1206;