Proposition for a Master 2 internship (January 2020 – June 2020)

Laboratory and Institute:
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Profile of the internship:
Crops, Arabidopsis, potyvirus, genetic resistances, CRISPR-Cas9, base editing,

Brief description of the internship:
Potyviruses, the largest group of RNA viruses, and the related group of luteoviruses, are of major concern for crops, by causing heavy losses in the field. The development of genetic resistances is an efficient way to provide healthy culture while reducing the use of pesticides.

We previously showed in Arabidopsis how the host translation initiation factors eIF4E are major susceptibility factors to potyviruses, and how genetic resistance strategies can be designed by editing the plant genes encoding those factors (Bastet et al., 2017, 2018 and 2019).

In the current project, the internship will focus on characterizing in several crops which genes are hijacked by some potyviruses. For this, protein-protein interaction studies, as well as in planta ectopic overexpression approach will be carried out. At the same time, 3D protein modelisation will also be performed to help defining efficient resistance alleles and plan gene editing approaches.

This will be performed in close collaboration with the private company Limagrain, set in Clermont-Ferrand, in the Gene Discovery team, and will allow the trainee to perform bioanalysis, molecular cloning and interact and participate in gene editing activities in several crops. Altogether, this work aims at generating durable genetic resistances in crops while maintaining the plant development and yield.