**PROJECT PROPOSITION - Lab1** (M1, second semester)

Supervisor(s): Sandra Cortijo

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Hosting lab: BPMP (Biochemistry and Plant Molecular Physiology)

Campus INRAE / Montpellier SupAgro Batiment 7

2, place Pierre Viala

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Period of proposed project (put **x** instead of ロ) :

Only 1st slot ロ Only 2nd slot

ロ One slot, but I have no preference on which ロ Both slots (with different groups)

1st slot: thursdays and fridays, from 3/2/2021 to 18/3/2021

2nd slot: thursdays and fridays (except for the last 2 weeks), from 31/3/2021 to 6/5/2021

Study of transcriptional variability between cells and between plants

Subject (5 lines max for the description)

Genetically identical cells or individuals under the same environment can display widely different gene expression levels. While we start to have some knowledge about transcriptional variability, we are still crucially missing the link between cell-to-cell and individual-to-individual gene expression variability. The aim of the project is to explore this in plants, by analyzing transcriptional variability between cells and between plants, and to compare them.

Technical tools to be used:

The students will use confocal microscopy to analyse the level of expression in cells of Arabidopsis roots for a gene of interest, known to have a high level of gene expression variability between plants. They will use a reporter line expressing mTurquoise addressed to the nucleus under the control of the gene of interest, and also H2B:RFP under the control of the 35S promoter as a control. Several plants will be analysed in order to compare signal between cells in a plant with signal between plants.

They will then use the software Imaris to extract signal in individual cells from the confocal images.

Finally, they will use R to analyse the data and quantify the level of gene expression variability.

Objectives:

The main objectives of this project are (i) to develop ways to analyse microscopy images and the data extracted and (ii) to quantify the level of transcriptional variability between cells and between plants for a gene of interest.