MEICOM Marie Curie ITN 2018 ESR Progress Summary

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Workpackage Title:

Interplay between the genomic environment and CO formation

Research aims and progress for the period:

1. Optical mapping
    I learned about the optical mapping technology such as theory, experimental process, related publication and so on. After having a better understanding of the technology, we found that optical mapping technology has some problems and it is not suitable for crossover detection. So we checked the information with Sander Peter (WUR) and decided to use 10x genomic technology to detect crossovers.

2. 10x genomics
    When it comes to 10x genomics, I also learned some knowledge including theory, process, related publication and so on. Then we spend time on questions related to its coverage and decided to use genomic DNA samples rather than single cell samples. We checked 10x genomic's resolution, SNP and indel frequency and crossovers landscape in maize to make sure the resolution is enough to detect crossovers in maize (B73xMo17). We decided to examine crossovers distribution in the F1 B73xMo17 because they are completely sequenced.

3. Experiment preparation
    We have done preparations including plants/seeds, protocol, reagents, plants' condition. We are working on protocol for nuclei isolation from pollen, high molecular weight DNA purification from nuclei, DNA fragment size check by PFGE, protocol for 10x system (droplet generation, index incubation, cleanup, library construction and quality control)

4. Meiosis cell detection under microscopy to check stage
    In this experiment, we collect anthers from maize, cut it to get out of meiosis cells, get the cells stained with different dyes and observe the cell under usual microscopy and fluorescence microscopy. In this experiment, we get to know how to detect meiosis cell under microscopy and know the plant meiosis time in the situation of our green house (B73).

Skills Training received:

A workshop of Hi-c data analysis from Dr.S.Grob university of Zurich.
A training of FACS technology: principle, usage and experiment from BD company.

Meetings attended:

MEICOM annual meeting in Birmingham, July 2018.

Outreach activity:

There will be a outreach activity in Birmingham in February 2019.