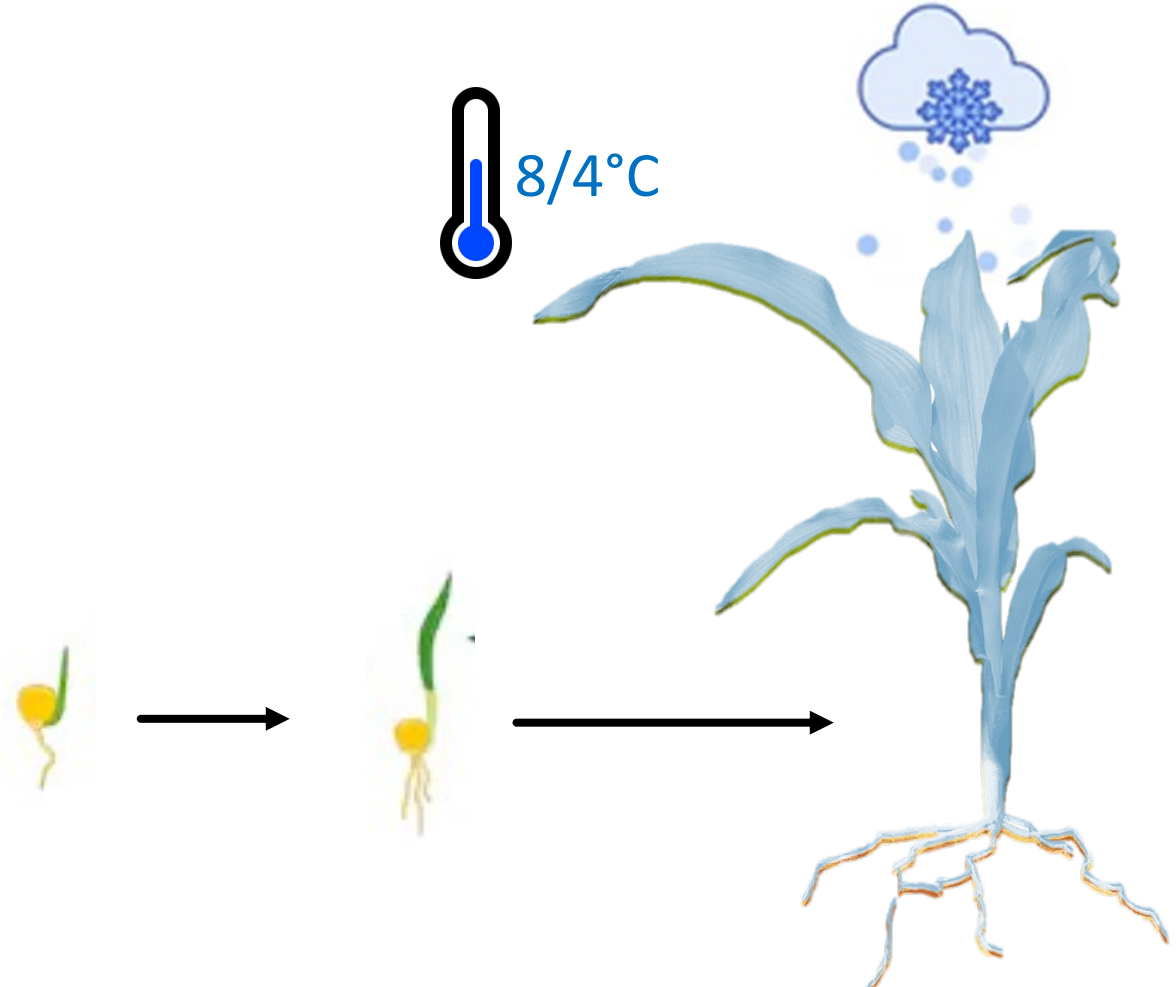
MAIZE,

IS THE MOST WIDELY GROWN CROP SPECIES WITH 1.6 TRILLION POUNDS PRODUCED EACH YEAR

BUT!

HAS ITS PRODUCTIVITY HIGHLY LIMITED BY COLD SPELLS IN WESTERN EUROPE

In fact, cold spells occurs every spring, damaging maize plants at an early stage.



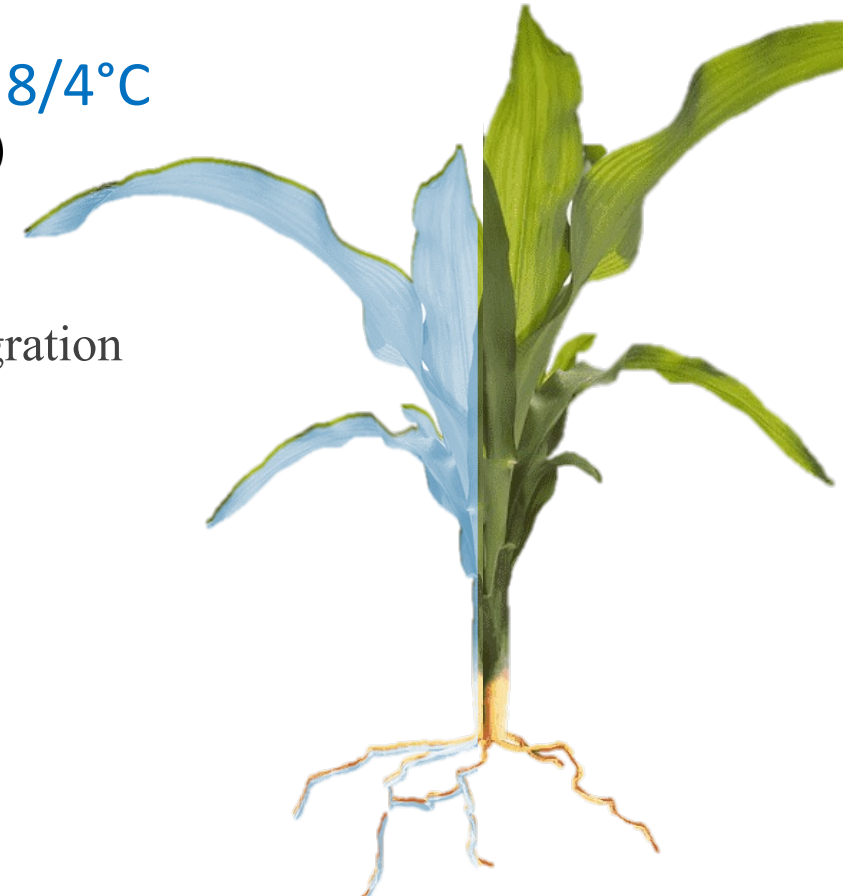
The direct effect of cold has been already wildly studied.

In contrast, very little is known about its recovery after cold stress.

COLD STRESS

8/4°C

- Growth inhibition
- Plasma membrane disintegration
- Cell dehydration
- Solute leakage
- Metabolite imbalance
- Photosynthetic inhibition



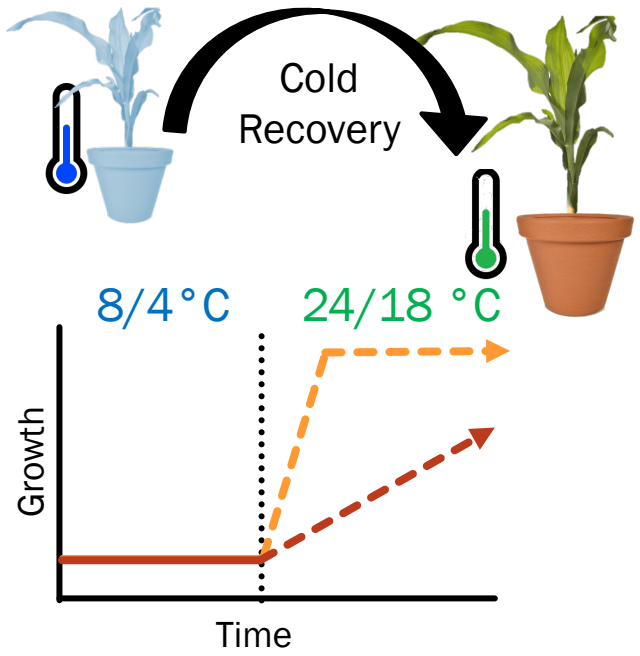
COLD RECOVERY

24/18 °C

- Faster leaf production?
- Cell rehydration?
- Metabolic homeostasis?
- Fast increased in chlorophyll content?

My goal and research plan

My goal is to understand the physiological, cellular and molecular mechanisms of cold recovery in the leaf growth zone of maize (*Zea mays*).



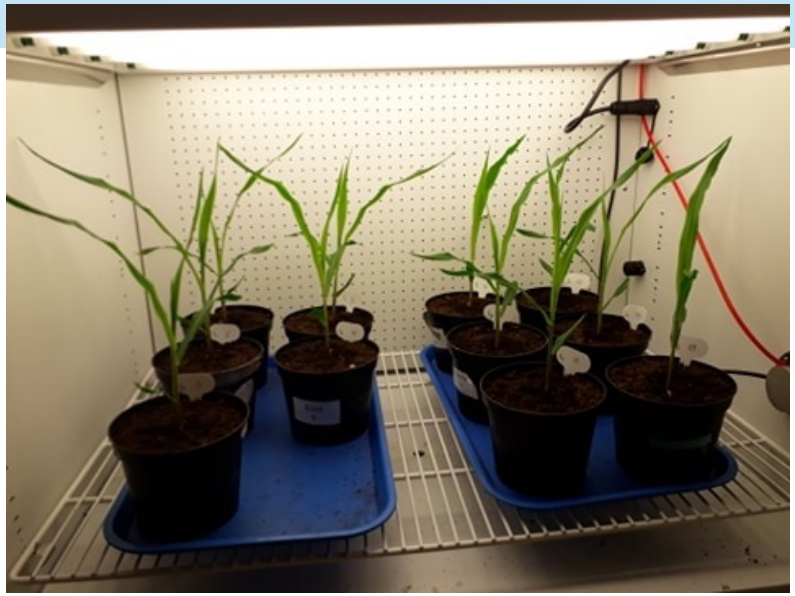
To acquire this goal, the following flow chart is used as my research plan.

RNA-seq
Physiology & biochemistry
Field testing & validation
Pre-screening & markers for cold recovery
Breeders & Biotechnology companies
Cold resilient maize varieties
Farmers
Maize leaf growth
Kinematics

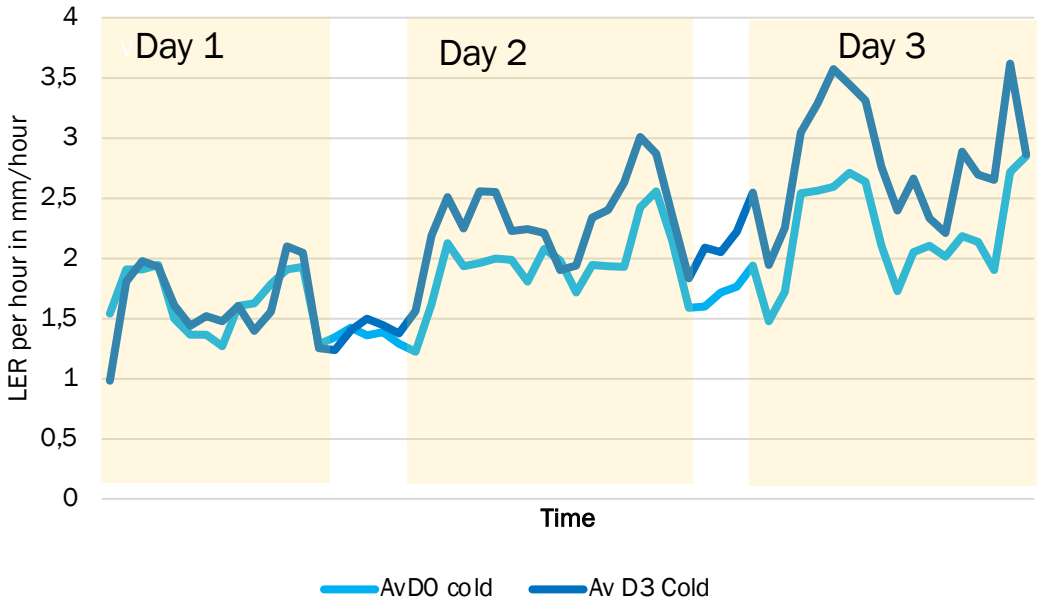
Maize material
- WT: B73
- Contrasting inbred lines
- Mutant lines

At the phenotypic level

Leaf Growth analysis

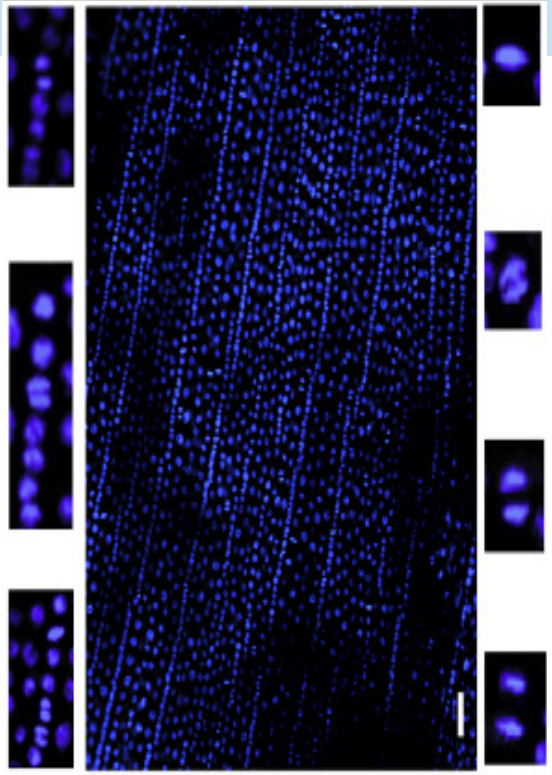


- Plant growth
- Leaf length measurement
- Image analysis
- Statistical analysis

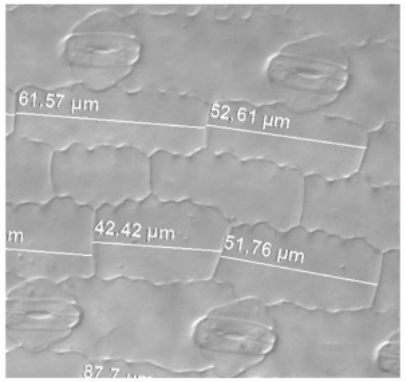


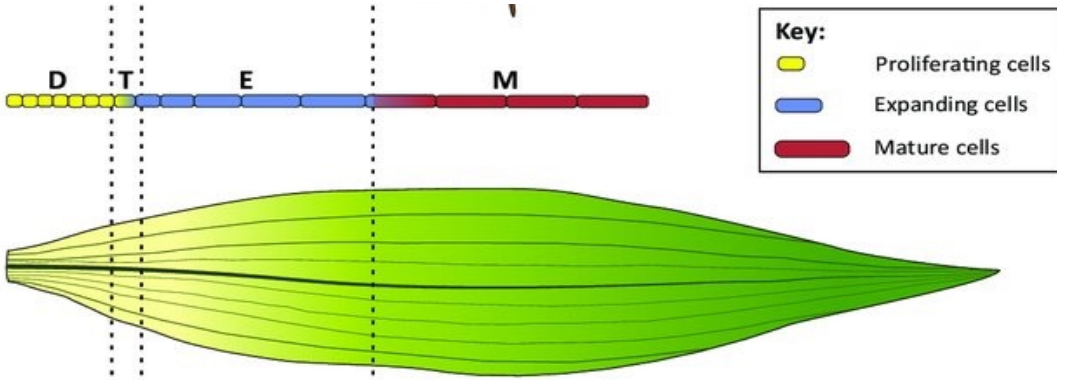
At the cellular level

Kinematics analysis



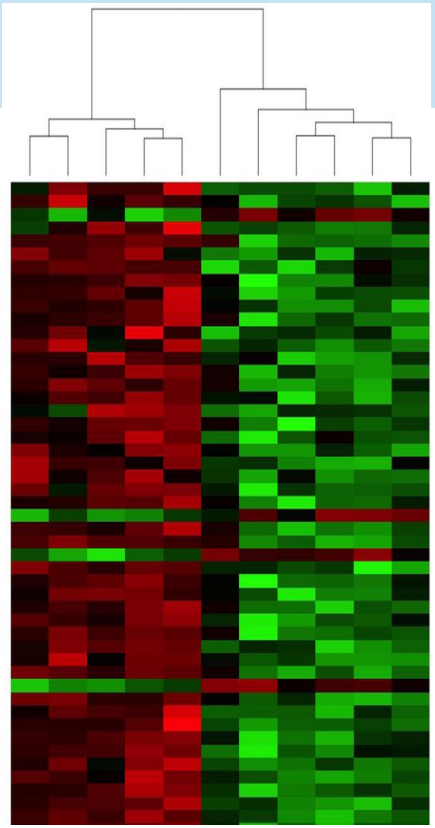
- Leaf elongation rate
- Cell size
- Meristem size

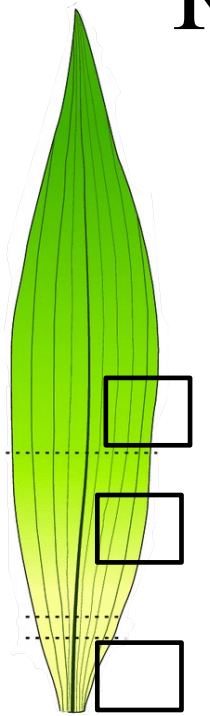




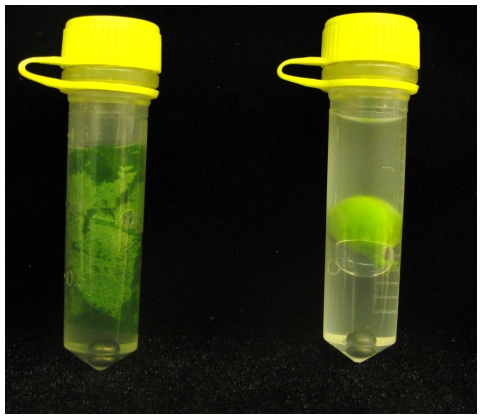
At the molecular level

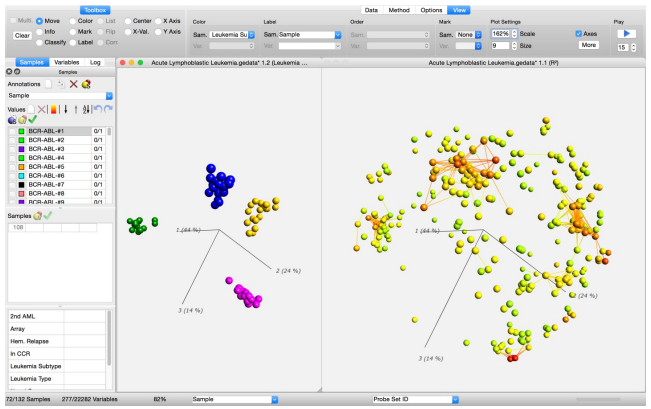
Next Generation Sequencing by RNA-seq





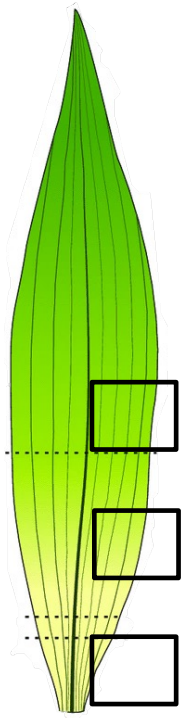
- RNA extraction
- Cluster differentially expressed genes
- Gene ontology utilisation
- Pathway analysis



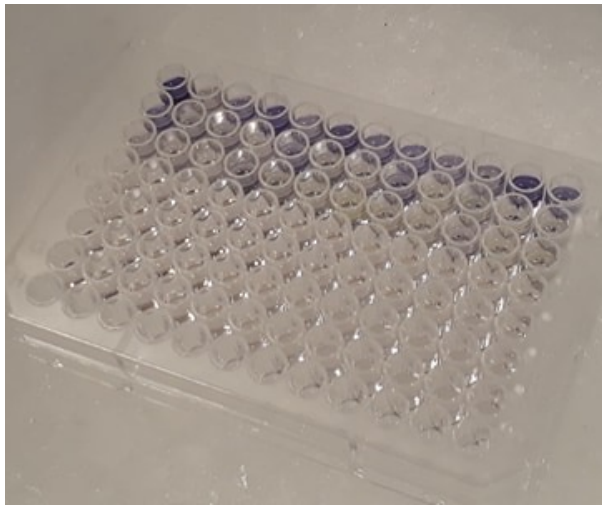


At the biochemical and physiological level

Metabolites analysis
Photosynthesis



- Antioxidant/ROS
- Chlorophyll fluorescence
- Gaz exchange



Where to find us?

Interested or want more information? Simply contact Cindy Lainé

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IMPRES

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