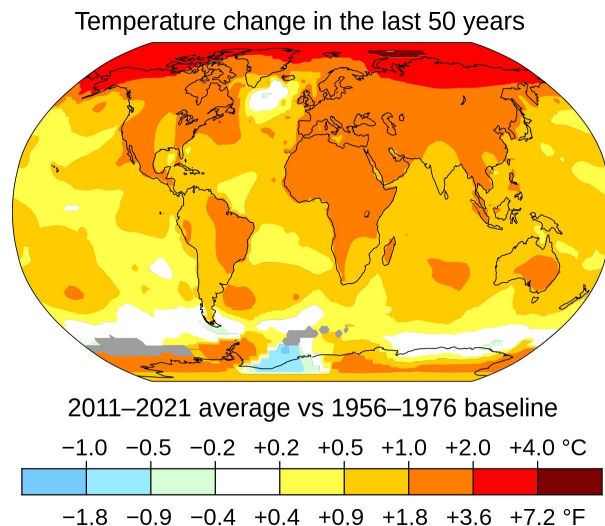


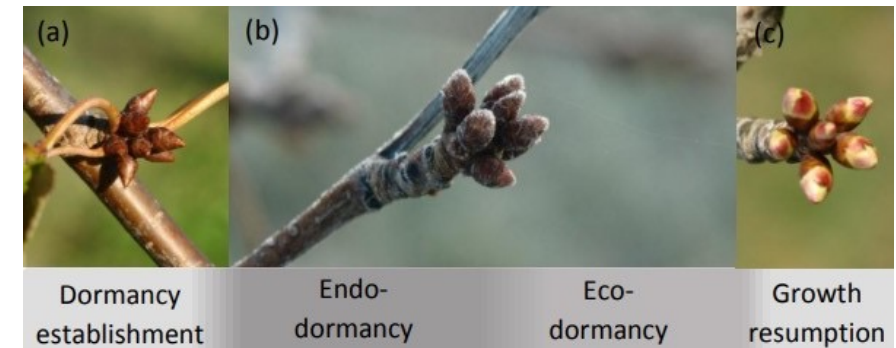
Unravelling dormancy progression in deciduous trees

Temperature is rising globally

- ⇒ Has effect on all ecosystems
- ⇒ Temperate forests: 6% of global land surface and responsible for +/- 13% of annual terrestrial carbon fixation
- ⇒ More moderate winters have an effect on the spring bud burst of deciduous trees (chilling requirement must be fulfilled) and therefore may impact the carbon uptake



Endodormancy = “winter dormancy”, inhibition of growth by internal bud signals. Buds need cold exposure to end the endodormancy



GOAL: we want to understand the genes and pathways responsible for the entrance and/or release of endodormancy and the effect of temperature on the dormancy depth and bud burst

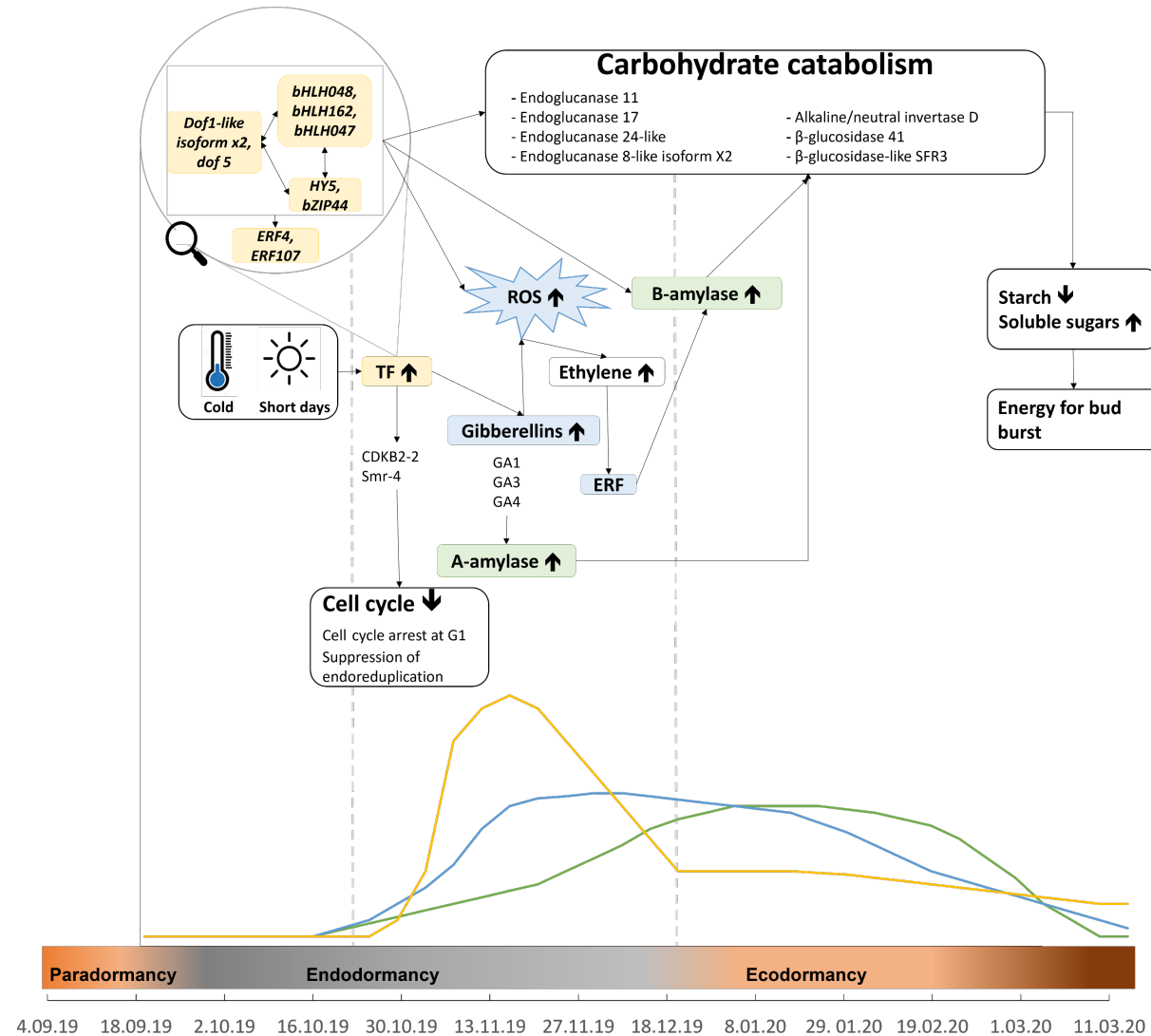


- *Fagus sylvatica*
- *Populus nigra*



Preliminary results

What happens in *Fagus sylvatica* L. buds under normal conditions?

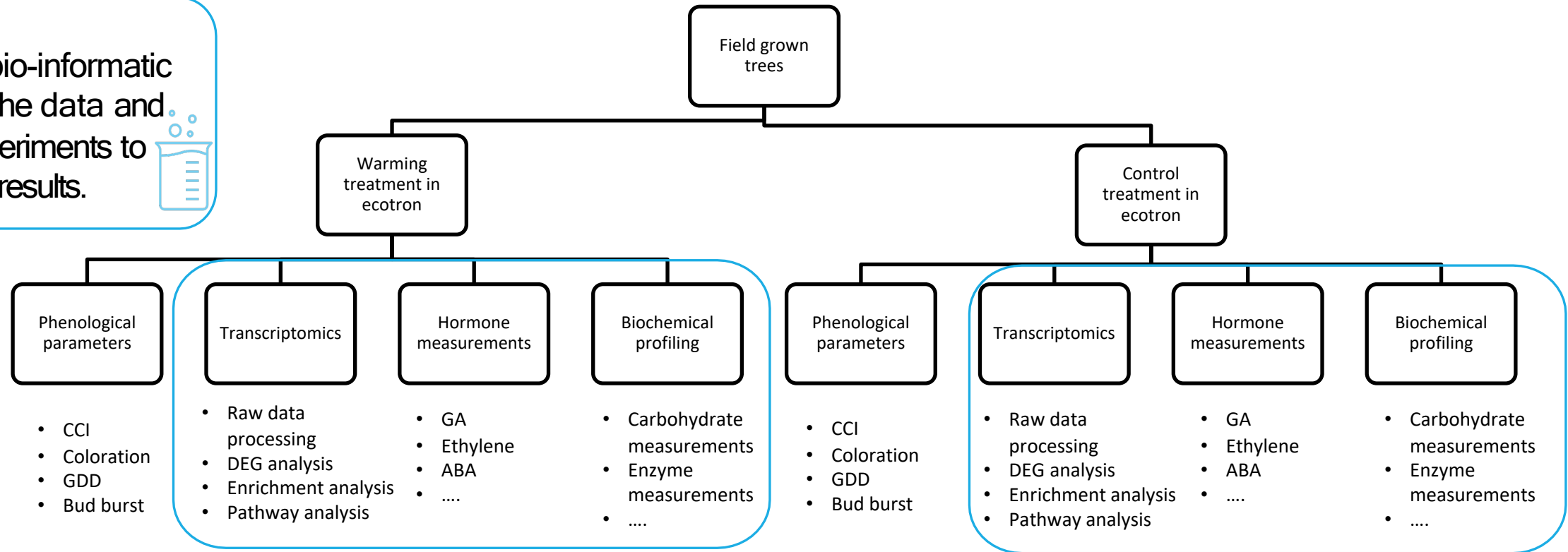


Experiments

What happens in *Populus nigra* buds (early successive) vs *Fagus sylvatica* L. buds (late successive)

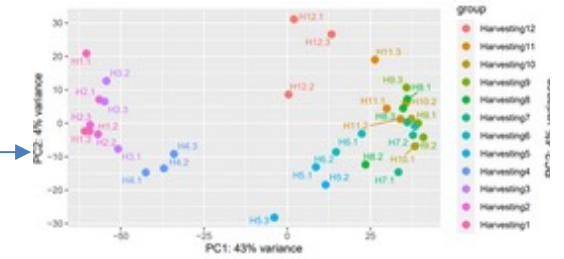
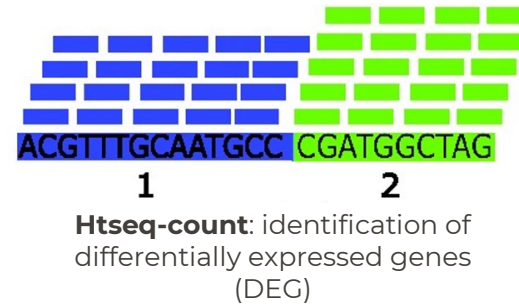
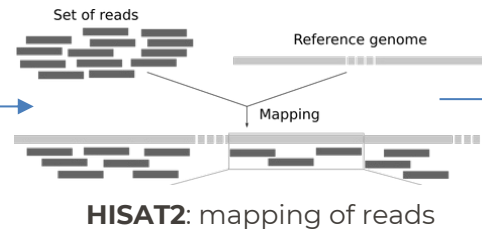
Your project

You will run bio-informatic analyses on the data and perform experiments to validate the results.



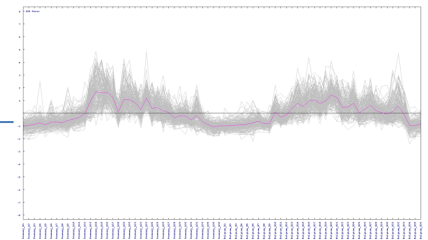
Transcriptomic analysis

Raw sequencing reads
Sequences obtained from buds harvested on 13 timepoints

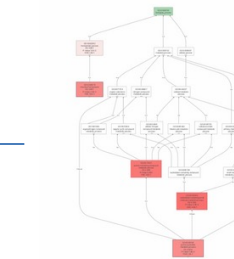


DESEQ2: quantitative analysis of DEG.

Log₂(FC) > |0,5| and FDR5



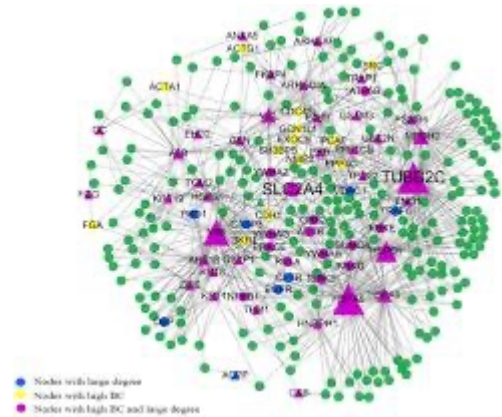
QTC: Clustering of expression patterns of DEG



GO-enrichment: functional analysis of DEG.



MEME and FIMO: promotor sequence analysis to find downstream genes regulated by DEG



STRING DB: Protein-protein interaction network analysis

Biochemical analysis



Metabolic profiling: measurement of ...

- Soluble sugars
- Starch
- Amylase activities
- ROS
- Invertase activities
-

Based on results of transcriptomic analysis



Hormonal profiling: measurement of ...

- ACC (ethylene)
- Gibberellins
-

Based on results of transcriptomic analysis

What's in it for you?

- Learn a lot of new techniques
 - Biochemical profiling
 - Hormone measurements
- Train your bio-informatic skills
 - Raw data processing
 - DEG and enrichment analysis
 - Pathway analysis
- Varied day-to-day internship



Send your motivation to:

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Integrated Molecular
Plant Physiology
Research

Plants and Ecosystems

