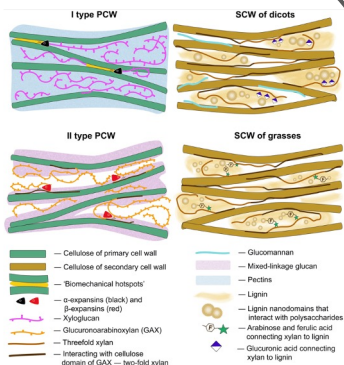


## Introduction

Plant cell wall is a complex structure which have a multiple role. Different plant species have significant variation of cell wall structure >

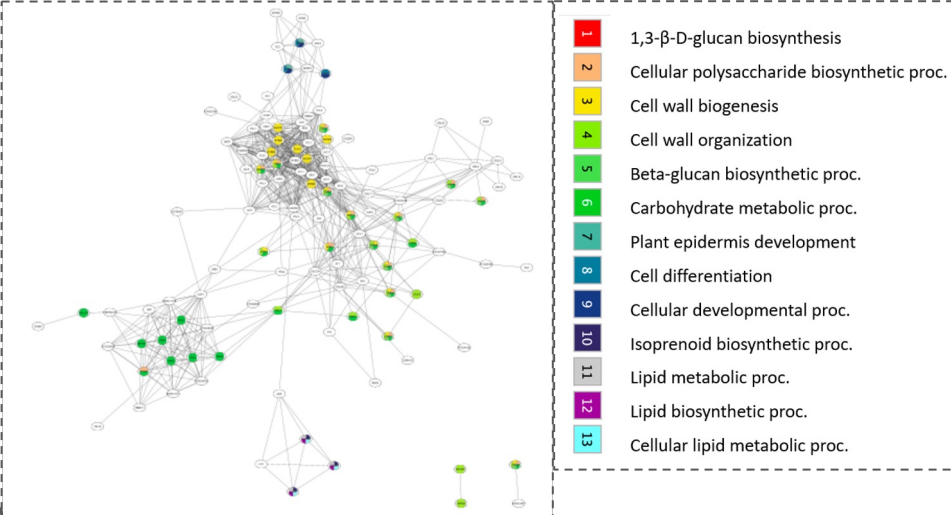
Understanding the features of gene networks for various species related to cell wall growth and thickening could help in:

- predicting the regulatory genes of this process
- comparative genetics in higher plants



10.1038/s41598-020-67782-0

## Reconstructed gene network of *A. thaliana* (119 nodes, 633 edges)



## Materials & methods

Selection of terms related to the metabolism and development of cell wall of plants



Selection of genes for various plant species

**BLAST**

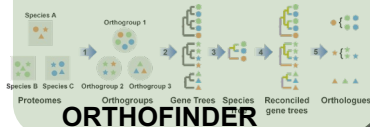


Reconstruction of gene networks related to plant cell wall processes

The STRING database



Detection of orthogroups



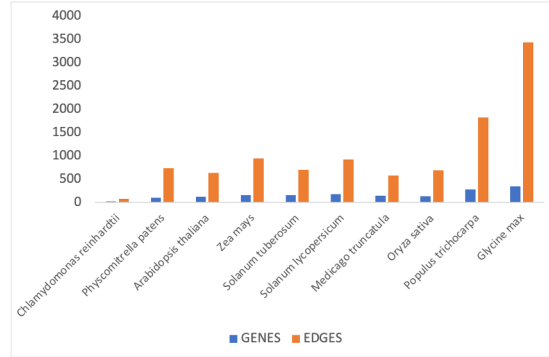
## Conclusions

1. The complexity of genetic networks related to the processes of cell wall thickening/cell wall growth is linearly increasing with increasing the number of genes in the studied species;
2. In regulation of this processes, especially in the *Populus trichocarpa*, are involved MYB and NAC transcription factors families

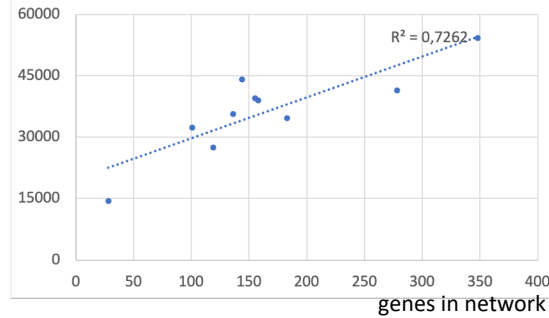
Polina Lapshova, Danylo Vernoslov, Ekaterina Berezutskaia, Aleksandr Bobrovskikh, Alexey Doroshkov

## Reconstructed gene networks stats

### Number of genes/edges in networks

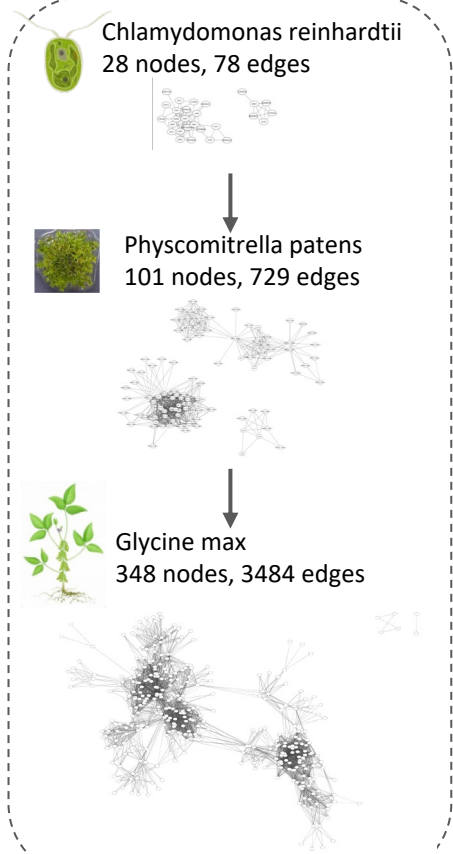


### genome size (gene counts)



-> Size of cell wall-associated network strongly correlates with genome size (in gene counts)

## The increasing complexity of cell wall networks through the evolution



## The gene network of cell wall processes of *Populus trichocarpa*: core interplay of transcription factors MYB's and NAC's

