

## O-05.2 Invited speaker

### News insights on plant plasma membrane lipids to understand regulation of homeoviscosity during temperature fluctuation

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Plasma membrane is a stable bilayer, crucial for signal transmission of the external environment, particularly diurnal and seasonal fluctuation of temperature. Glycerolipids, sphingolipids, sterols are elements of the PM organization, but they are not symmetrically organized leading to two fundamentally biophysical properties of the 2 leaflets. This has been described in animal cells, but evidences in plant PM remain very scarce.

I will highlight insights on plant PM asymmetry of Arabidopsis obtained through a work of 4 laboratories: 1/ we determined the asymmetry of lipid packing and evidenced that lipid packing of the apoplastic leaflet is much higher than the cytoplasmic. 2/, we provide the reference of the plant PM lipidome and proteome and identified a core of 2165 proteins and showed that the trans membrane spanning proteins display a structural asymmetry 3/, we determined the repertoire of 405 lipids with sterols, phospholipids, and sphingolipids present in similar proportions. 4/ using phospholipase and sodium periodate treatments, we showed that glycerolipids, sterols and sphingolipids were asymmetrically distributed in the PM. 5/ This distribution allowed the modelisation by molecular dynamic. 6/ finally, I will emphasize the role of lipids in the regulation of homeoviscosity during temperature fluctuation, particularly the role of stigmasterol/sphingolipids.