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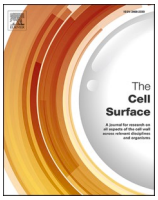

Advances on cell wall biology: Highlights from the XVI Plant Cell Wall Meeting

This special issue features some of the advances in the field of cell wall biology, which were presented during the last Plant Cell Wall Meeting (https://www.cellwall2023.org) that took place at Málaga (Spain) between 18–22 June 2023, and was attended by 330 researchers from more than 30 different countries. This meeting was the 16th edition since the first Plant Cell Wall Meeting took place in 1978 and has been held in different locations every 3 years. Málaga took over from Cambridge (UK) and the next edition (XVII Cell Wall Meeting) will be held in Porto (Portugal) in 2026. In the approximately 80 oral communications and more than 100 posters, we had the opportunity to hear from researchers at all scientific stages about the latest advances in the field of plant cell walls. The classic sessions on biosynthesis and modification of cell wall components were strongly joined by several sessions on the roles of the cell wall in regulating plant responses to biotic and abiotic stresses, and plant development. We had also the opportunity to learn about algal and fungal cell walls as well as new methodologies and tools for cell wall analysis. The organisers of the XVI Cell Wall Meeting are pleased to present some of the advances presented at the event in this special issue of The Cell Surface.

First, a group of researchers from the Universities of Ohio (USA) and Porto (Portugal) showed how the use of cutting-edge technologies in molecular biology such as gene editing will boost this field of research in the coming years (Kaur et al., 2023). Using CRISPR-Cas9, they were able to generate octuple mutants in a whole family of galactosyltransferases, which are responsible for adding galactose to a group of very important glycoproteins in the plant cell wall, known as arabinogalactanproteins (AGPs). The study of the phenotypes of the different mutants led to the conclusion that the glycans of the AGP protein cores are essential for normal vegetative and reproductive growth of plants.

In another paper included in the special issue, Fernández-Calvo et al (2024) showed an important advance relevant to the field of glycan-induced plant immunity. This field is booming, with many researchers from the field of peptide-triggered immunity joining the cell wall field to try to decipher the complexity of this plant stress-monitoring-mechanism mediated by cell wall glycans. Although numerous glyco-ligands that trigger immunity hallmarks in plants have been characterised in recent years, the mechanisms by which they are perceived are still largely unknown. In fact, this work (Fernández-Calvo et al., 2024) shows such capacity for some glycans such as xylans derived from plant cell walls. Moreover, one of the strong points of this work was the partial characterisation of the mechanisms of perception of xylan and arabinoxylan derived oligosaccharides in *Arabidopsis thaliana*, which is demonstrated to involve several members of the Leucine Rich Repeat-Malectin (LRR-MAL) receptor kinases (RKs) family of receptors.

Finally, we find in this special issue an example of the openness of this congress to researchers working on cell wall of other organisms, such as fungi. Thus, in the last paper of this special issue, it is shown the analysis of the cell wall composition of 18 fungal species from different groups of fungi representative of different positions in the phylogeny of this kingdom of organisms (Yugueros et al., 2024). Most of the fungal organisms analysed may be plant pathogens, which adds further interest to this article as these species are much less studied than animal pathogens. This study showed that there is an evolution in fungal cell wall composition in that chitin is conserved in all groups, but other components are specific to certain lineages. Thus, this work opens the door to future studies to deepen the understanding of this structure of plant pathogenic fungi, which could allow the development of new disease control strategies using fungal cell wall key elements as targets.

As these articles demonstrate, the plant cell wall continues to be a critical and evolving area of research, opening interesting and novel lines of research. It will be interesting to follow the evolution of this field thanks to new technologies recently developed in the field of plant molecular biology and carbohydrate structural biochemistry, the fusion of which has great potential. Finally, the organisers of the XVI Cell Wall Meeting we would like to thank to The Cell Surface for the support within this event and for the opportunity to showcase some of the advances shown in this special issue.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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