

Abstract:

The cell wall is one of the defining parts of the plant cell. Cell walls resist turgor pressure, give plants their rigidity and still allow the cell to grow despite their stiffness. The plant cell wall is a composite material that consists of different elements; thus, the knowledge of the plant cell wall composition helps us understand the impact of the mentioned pH changes. Alterations of plant cell wall properties result in a change of plant cell growth rate. A prime example of this is the modification of wall properties by pH change, termed the acid growth. Although acid growth has been studied for a long time, we still do not fully understand the underlying mechanisms, as we have not yet identified all the agents involved in acid growth and our ability to determine apoplastic pH is limited. Local cell wall pH fluctuations arise also due to plant organs having different roles and being affected by a diverse range of stimuli. Despite the fact that new pH measurement techniques, such as genetically encoded fluorescent probes, were developed in the last two decades, there is still a need to provide a higher spatiotemporal resolution of pH analysis.

Key words: *Arabidopsis*, apoplastic pH, cell growth, acid growth theory, cell wall, auxin, apoplastic pH measurement