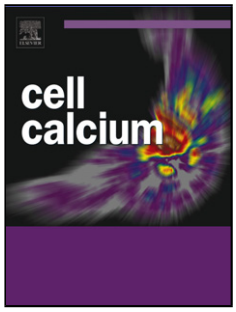

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Plant phospholipase C family: Regulation and functional role in lipid signaling

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Abstract

Phospholipase C (PLC), a major membrane phoshpholipid hydrolyzing enzyme generates signaling messengers such as diacylglycerol (DAG) and inositol 1,4,5-trisphosphate (IP_3) in animals, and their phosphorylated forms such as phosphatidic acid (PA) and inositol hexakisphosphate (IP_6) are thought to regulate various cellular processes in plants. Based on substrate specificity, plant PLC family is sub-divided into phosphatidylinositol-PLC (PI-PLC) and phosphatidylcholine -PLC (PC-PLC) groups. The activity of plant PLCs is regulated by various factors and the major ones include, Ca^{2+} concentration, phospholipid substrate, post-translational modifications and interacting proteins. Most of the PLC members have been localized at the plasma membrane, suited for their function of membrane lipid hydrolysis. Several PLC members have been implicated in various cellular processes and signaling networks, triggered in response to a number of environmental cues and developmental events in different plant species, which makes them potential candidates for genetically engineering the crop plants for stress tolerance and enhancing the crop productivity. In this review article, we are focusing