

Rice Peroxygenase Catalyzes Lipxygenase-dependent Regiospecific Epoxidation of Lipid Peroxides in the Response to Abiotic Stressors

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Plant oxylipins are ubiquitous molecules that play important roles during plant development and in the response to environmental abiotic or biotic stressors and/ or pathogens . The enzymatic synthesis of oxylipins in the octadecanoid pathway is initiated by LOX. The initial product of the LOX reaction is subsequently metabolized by multiple enzymatic pathways, which include at least seven distinct branched routes. Among those branched routes, plant PXG catalyzes the transfer of an oxygen atom from a peroxide to various substrates by either an intramolecular or an intermolecular process. Products of the PXG pathway are metabolized into signaling molecules that play pivotal roles in plant responses to oxidative and other types of environmental stress. Our primary network analysis of co-expressed stress-regulated genes demonstrated that the expression of OsPXG9 is negatively correlated with the expression of genes involved in jasmonic acid biosynthesis. Here, we extend our studies to provide novel analyses of the: i) structure and cellular location of OsPXG; ii) abundance and distribution of products of 9- and 13- OsPXG pathways, iii) expression of OsPXG under abiotic (drought and salt) and biotic stress (JA and SA)