

ABSTRACT

Plant autophagy is a crucial evolutionary conserved process for recycling cytoplasmic material under stress conditions or during development. The autophagic pathway is negatively regulated by TOR kinase, a versatile molecule modulating a wide range of cellular processes. In mammals, TOR kinase may be activated by phosphatidic acid, a vital signalling lipid. This thesis aims to prove the possible involvement of phospholipids in plant autophagy. I analysed the rate of primary root inhibition in knock-out mutants coding phospholipases in *A. thaliana* with induced autophagy, measured activity of lipid metabolising enzymes in wild type and *atg10* mutant and observed autophagosome formation in selected mutants. Autophagosomes were labelled by fluorescent protein *in vivo* and by indirect immunolabelling in fixed samples. Using advanced stereological approach, I optimized a method for obtaining an unbiased estimate of autophagosome number in plant root cells.