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p24 family proteins are involved in transport to the plasma membrane of GPI-anchored proteins in plants

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摘要	p24 proteins are a family of type-I membrane proteins which cycle between the endoplasmic reticulum (ER) and the Golgi apparatus via Coat Protein I (COPI)- and COPII-coated vesicles. They have been proposed to function as cargo receptors, but the identity of putative cargos in plants is still elusive. We previously generated an Arabidopsis thaliana quadruple loss-of-function mutant affecting p24 genes from the delta-1 subclass of the p24 delta subfamily (p24δ3δ4δ5δ6 mutant). This mutant also had reduced protein levels of other p24 family proteins and was found to be sensitive to salt stress. Here, we used this mutant to test the possible involvement of p24 proteins in the transport to the plasma membrane of glycosylphosphatidylinositol (GPI)-anchored proteins. We found that GPI-anchored proteins mostly localized to the ER in p24δ3δ4δ5δ6-mutant cells, in contrast to plasma-membrane proteins with other types of membrane attachment. The plasma-membrane localization of GPI-anchored proteins was restored in the p24δ3δ4δ5δ6 mutant upon transient expression of a single member of the p24delta-1 subclass, RFP-p24δ5, which was dependent on the coiled-coil domain in p24δ5. The coiled-coil domain was also important for a direct interaction between p24δ5 and the GPI-anchored protein arabinogalactan protein 4 (AGP4). These results suggest that Arabidopsis p24 proteins are involved in ER export and transport to the plasma membrane of GPI-anchored proteins.
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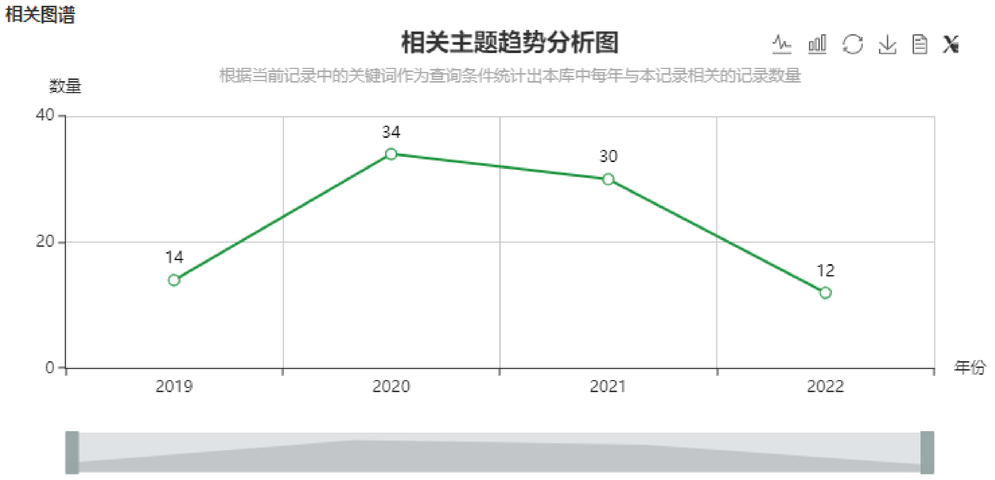

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