

P038 Rab-A2 and -A3 GTPases define a *trans*-Golgi endosomal membrane domain that contributes substantially to the cell plate

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The Ypt3/Rab11/Rab25 subfamily of Rab GTPases has expanded greatly in *Arabidopsis*, comprising 26 members in six provisional subclasses, Rab-A1 to Rab-A6. We show that the Rab-A2 and Rab-A3 subclasses define a novel post-Golgi membrane identity in *Arabidopsis* root tips. The Rab-A2/A3 compartment was distinct from but often close to the Golgi stacks and pre-vacuolar compartments and partly overlapped the VHA-a1 trans-Golgi compartment. It was also sensitive to brefeldin-A and accumulated FM4-64 before pre-vacuolar compartments. Mutations in RAB-A2^a that were predicted to stabilise the GDP- or GTP-bound state, shifted the location of the protein to the Golgi or plasma-membrane respectively. In mitotic cells the Rab-A2/A3 compartment was the principal site at which the cytokinesis-specific syntaxin KNOLLE accumulated. During cytokinesis Rab-A2 and Rab-A3 proteins localised precisely to the growing margins of the cell plate but VHA-a1, GNOM, and pre-vacuolar markers were excluded. Inducible expression of dominant-inhibitory mutants of RAB-A2^a resulted in enlarged, polynucleate, meristematic cells with cell-wall stubs. The Rab-A2/A3 compartment is therefore a trans-Golgi compartment that communicates with the plasma-membrane and early endosomal system and contributes substantially to the cell plate. Despite the unique features of plant cytokinesis, membrane traffic to the division plane exhibits surprising molecular similarity across eukaryotic kingdoms in its reliance on Ypt3/Rab11/Rab-A GTPases.