

論文の内容の要旨

論文題目 Study on the roles of the trans-Golgi network and RAB11 family on endocytosis in plant cells (植物細胞のエンドサイトーシスにおけるトランスゴルジ網と RAB11 ファミリーの機能の研究)

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Environmental cues are perceived at the plasma membrane (PM), which evokes downstream signaling to induce the specific response. Cell surface proteins play critical roles in the perception of environmental stimuli at the PM and ensuing signal transduction. Intracellular localization of such proteins must be strictly regulated, which requires elaborate integration of exocytic and endocytic trafficking pathways. Subcellular localization of *Arabidopsis thaliana* FLAGELLIN SENSING 2 (FLS2), a receptor that recognizes bacterial flagellin, also depends on membrane trafficking. However, our understanding about the mechanisms involved is still limited. In this study, I visualized ligand-induced endocytosis of FLS2 using green fluorescent protein (GFP)-tagged FLS2. Upon treatment with the flg22 peptide, internalized FLS2-GFP from the PM was transported to a previously unknown compartment with an intermediate property of the trans-Golgi network (TGN) and the multivesicular

endosome, which gradually discarded the characteristics of the TGN along the trafficking pathway. I further found that the endocytic processes of FLS2 involve RABA/RAB11 members at distinct steps: RABA4c and RABA6a function on transport of internalized FLS2 to and from the intermediate compartment, respectively. Moreover, I demonstrated that transport of *de novo*-synthesized FLS2 to the PM also involves a distinct RABA/RAB11 member, RABA1b. My results demonstrate the complex regulatory system for properly localizing FLS2 and functional differentiation in RABA members in endo- and exocytosis.