

Characterizing SYT6, a lipid transfer protein at the secretory pathway.

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The SYT6 protein from *A. thaliana* has recently been identified as a lipid transfer protein localized at membrane contact sites (MCS). MCS are regions where membranes of two organelles closely approach without membrane fusing. Historically, research has focused on endoplasmic reticulum (ER) and plasma membrane MCS, but recently MCS involving the ER and other organelles have come to light. SYT6 is a plant-exclusive protein exhibiting a modular structure shared with mammalian Extended-Synaptotagmins and other plant synaptotagmins, such as SYT1.

Our ongoing experiments suggest that SYT6 anchors itself to the ER via its transmembrane domain, contains a lipid trafficking domain (named SMP) and attaches to specific trans-Golgi Network (TGN) vesicles through its C2 domains and coiled-coil domain. These observations make SYT6 particularly intriguing, as its physiological roles remain unclear.

Currently, our focus is on studying SYT6 to uncover its expression, subcellular localization and most importantly, its function. Confocal imaging, has confirmed SYT6 attachment to the ER and to vesicles in continuous motion, suggesting involvement in secretory trafficking. Co-Immunoprecipitation and BiFC experiments, have confirmed the interaction between SYT6 and specific TGN proteins linked to the independent Golgi TGN (GI-TGN). Preliminary findings indicate a correlation between SYT6, and exocytosis. Furthermore, *syt6* mutant displays altered negative gravitropism. Altogether, these findings suggest that SYT6 represents a novel ER-TGN CS protein that may play a role in secretory trafficking.

Funding source: This work has been funded by grant PID2021-127649OB-I00 (by MCIN/AEI/ 10.13039/501100011033 and by the European Union), Ayuda D2 Plan Propio by Universidad de Málaga and Proyecto QUAL21 012 IHSM (Consejería de Universidad, Investigación e Innovación, Junta de Andalucía).