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Yeast dynamin plays a key role in the Endosome-to-Golgi traffic

Yeast dynamin (Vps1) has been implicated in recycling traffic from the endosome to the *trans-Golgi network* (TGN). We previously revealed a genetic interaction of Vps1 with Ypt6 and all components of the GARP tethering complex that anchors an incoming vesicle to TGN membrane. The present study identified a 33 amino acid segment of Vps51, a GARP subunit that interacts with Vps1. Based on sequence homology between Vps51 and its mammalian homolog Ang2; we identified two key residues of Vps51, E127 and Y129 that bind Vps1. The replacement of these residues led to severe defects in endosome-to-TGN transport of Snc1, providing evidence of the physiological relevance of the interaction of Vps51 with Vps1 for the traffic. Furthermore, our functional analysis revealed that Vps1 acts upstream of Vps51 and that the absence of Vps1 resulted in defects in targeting of Vps51 and its binding partner Tlg1 to the TGN. The present study also reveals that Vps1 physically interacts with *Ypt6*. Interestingly, severe defects in retrograde trafficking caused by loss of Ypt6 were rescued by overexpression of Vps1 and vice versa. Furthermore, overexpression of Vps1 GTPase mutants was not sufficient enough to rescue abnormal Snc1 recycling in ypt6Δ cells. These results suggest that the GTP binding and hydrolysis of Vps1 is essential for this trafficking pathway and that Vps1 and Ypt6 may function parallel. Finally, this study shows that Vps1 interacts with two SNARE proteins, Vti1 and Snc2, functioning for endosome-derived vesicle fusion at the TGN, pointing to a novel role of Vps1 in the late stage of the endosome-to-Golgi traffic. Therefore, we propose that Vps1 and Ypt6 converge on the GARP tethering machinery for efficient tethering/fusion at the TGN.

Speaker Biography

Kyoungtae Kim is a Professor at Missouri State University in Springfield, MO. He received his BA and MA in Biological Science at Kyungpook National University in Taegu, Korea. He went on to obtain his PhD in Biology at Florida State University in Tallahassee, Florida, and completed his Post-Doctoral at Washington University in St. Louis, Missouri, where he studied Cell Biology and Physiology. He is now located at Missouri State University where his research focuses on Diverse Cellular Processes including Endocytic Pathway, Intracellular Trafficking of Proteins and Membranes, Membrane Organization, Nanomaterial Traffic and Nanomaterial-Mediated Global Gene Expression Pattern Changes.

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