

The at the site of cytokinesis (seguí- simarro

[Environment](#)



**ASSIGN
BUSTER**

The mutation of this complex impairs tethering and fusion of the vesicles that results in accumulation of vesicles inside cell. (Novick et al. 1980; Heider and Munson, 2012). During cell division, cell plate formation is carried out by the accumulation of the vesicles at the site of cytokinesis (Seguí-Simarro et al. 2004) and their fusion by the exocyst complex (Žárský et al.

2013). Mutation of *exo 70A1* shows some defects in cell plate formation (Fendrych et al. 2010), inability in root growth, loss of apical dominance, impaired flower development and smaller organs which proves that they are important in growth and development process (Synek et al. 2006).

There are different isoforms of the exocyst subunits, which regulate exocytosis related to biotic (Peňková et al. 2011) and abiotic stress (Lin et al. 2013; Žárský et al. 2013) and other functions such as membrane recycling, autophagy related vesicular transport (Žárský et al. 2013).

Sec3 are the primary subunit to connect with the target membrane (Finger et al. 1998), their mutants in yeast resulted in accumulation of the secretory vesicle in cytoplasm as they were unable to dock with the membrane (Finger and Novick, 1997). *Sec 3* mutants are reported with root hair growth defects that leads to various growth defects in plants (Wen et al. 2005).

Mutation of *Sec 8* shows defective pollen germination and tube growth (Cole et al. 2005). The subunit *exo84* plays key role in formation of exocyst complex and targeting (Zhang et al. 2005). Study of *Exo 84* mutation in yeast indicate their role in post Golgi secretion process (Zhang et al. 2005).

Exo 84 homolog *exo84b* mutation resulted vesicles accumulation in cytoplasm, cytokinesis defects, irregular phenotype with retarded growth and sterility (Fendrych et al. 2010). The accumulated vesicles in *exo84* mutants contain compounds such as pectin and xyloglucan (Fendrych et al. 2010). Other subunits such as SEC6, SEC8, SEC15b and EXO70A1 are also detected in various stages of cell plate formation (Fendrych et al. 2010).

In plants mutation of *Sec5*, *Sec6*, *Sec8*, *Sec15a* resulted less pollen germination with reduced growth (Hala et al. 2008). During cytokinesis secretory vesicles are directed to the cell plate formation matrix where exocyst complex assist tethering and fusion (Fendrych et al. 2010).

After fusion vesicles are elongated projecting dumbbell shape, connect other vesicles and form a perforated layer with network of tubes and vesicles with callose deposition (Fendrych et al. 2010). Till date study of exocyst complex towards defense is limited however, from the perspective of cellular response towards various biological activity as they relate repair and growth, speculation could be made from these experiments that they use these similar strategies in defense responses (Peňková, et al. 2011, 2017).

All the exocyst subunits have their homologs in plants (Elias et al. 2003; Synek et al. 2006). Mutation of exocyst subunits; *Sec5*, *Sec6*, *Sec8*, *Sec15A*, *Exo70B*, and *Exo 84B* in *Nicotiana benthamiana* plants resulted impaired resistance to *Phytophthora infestans* (Du et al. 2017).

Also, *Sec5*, *Sec6*, and *Sec10* mutants in *N. benthamiana* showed more bacterial infection and growth whereas mutants of other subunits had no effect on resistance (Du et al. 2017). The exocyst subunit *Sec5* is related with <https://assignbuster.com/the-at-the-site-of-cytokinesis-segu-simarro/>

the secretion of Pathogenesis-Related (PR) proteins as their mutants produced less PR proteins with higher susceptibility to fungal pathogen (Du et al. 2015).

Plants pathogens with their virulence gene attack components of vesicle transport system by impairing secretion of Golgi-derived vesicles (Driouich et al. 1997), callose deposition and penetration resistance (Nielsen et al. 2012). Thus, although limited experiments have been conducted regarding their defense responses however as described above, earlier experiments related to either growth, development and repair or defense process and mechanism, indicate that the octameric protein complex exocyst is involved in the defense processes providing genetic resistance in plants thereby playing a vital role in the vesicle membrane fusion.