

# Volcano-like structure in *Candida parapsilosis* cell wall: a gate associated with vesicles release.

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Various fungi including *C. parapsilosis* (*Cp*) release vesicles that impact pathogenesis. We have previously shown that fatty acids metabolism modifies *Cp* virulence, although the mechanisms for these effects are not fully elucidated. Our present work analyzes the vesicular release in wild-type (WT) and the fatty acid biosynthesis mutant lacking the desaturase (*Ole1*). The  $\Delta$ OLE1 mutant releases fewer vesicles that are larger than those produced by WT yeasts. TEM and SEM images of yeasts show that  $\Delta$ OLE1 accumulates vesicles in the periplasm. Moreover, WT yeast display structures that protrude into the cell wall with lower electron density inside, and these protuberances are similar to "gates". In the cell wall,  $\Delta$ OLE1 yeast cells exhibits stronger staining for mannose, chitin and glucans, but reduced chitin oligomers when compared to WT yeasts. The disruptant also has reduced chitinase and secreted aspartyl protease activity. Taken together, these results suggest an important role of fatty acid synthesis on vesicle release. We have named the protruding structures, aka "gates", in the WT cells as "Volcano-like" structures. The chitinase activity in WT yeasts may act in the vesicles to "loosen" the cell wall and permit completion of vesicle formation and release. Therapies directed at fatty acid synthesis may be an alternative pathway to combat this fungal infection.

**Keyword:** *Candida parapsilosis*, extracellular vesicles, cell wall

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Summary:

These works suggest the enzyme on vesicles probably act in the "loosen" of cell wall forming a structure like a "volcano" to environment achieve.