

**Stony Brook University
The Graduate School**

Doctoral Defense Announcement

Abstract

Long-chain polyprenols promote spore wall formation in *Saccharomyces cerevisiae*

By

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Dolichols are isoprenoid lipids of varying length, which act as sugar carriers in glycosylation reactions in the endoplasmic reticulum and Golgi. In *Saccharomyces cerevisiae*, *SRT1* encodes a cis-prenyltransferase, which synthesizes long chain polyprenol, a precursor to dolichol. Srt1 is found on lipid droplets, rather than in the endoplasmic reticulum (ER), and the cellular function of its products is unclear. While deletion of *SRT1* produces no strong phenotype in vegetative cells, when sporulated, *srt1* Δ cells produce spores that lack the chitosan and dityrosine layers of the spore wall. In sporulating cells, Srt1 is localized to lipid droplets that are associated with the spore wall, and sporulating yeast cells display an *SRT1*-dependent increase in long chain polyprenols and dolichols in lipid droplets. The cis-prenyltransferase activity of Srt1 is necessary for proper spore wall formation, indicating that it is the lipid products of Srt1 activity that are required for this process. Characterization of the *srt1* Δ mutant suggests that Srt1-derived polyprenols are necessary for activity of the chitin synthase Chs3 in sporulating cells. These results reveal a function for polyprenols outside of their well-characterized role as sugar carriers in the ER.

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