

Figure S1. Growth curves relative to *MCY4/ScISM4Δ1*, *MCY4/ScLSM4*, and the wild-type strain CML39-11A. Strains were exponentially growing in YPD medium, and OD₆₀₀ values were taken every two hours. Error bars represent the standard deviation of three independent biological replicates.

Table S1. Growth rate (μ) of the strains of interest.

Strain	Growth rate (μ)
CML39-11A	0,375520
<i>ScISM4Δ1</i>	0,270481
<i>ScLSM4</i>	0,326280

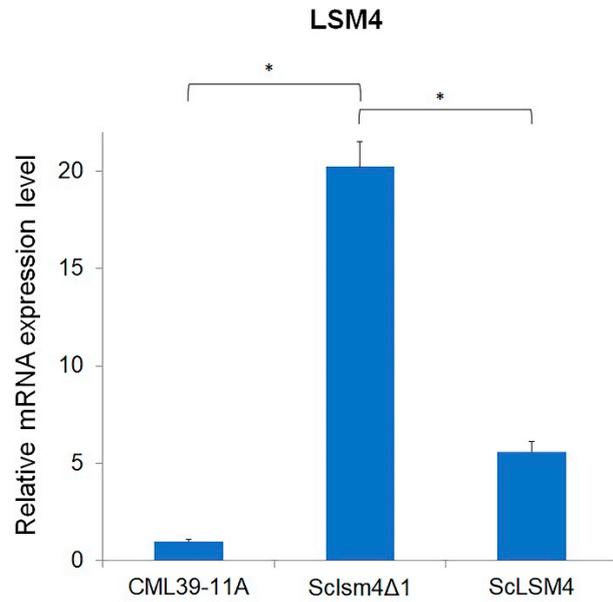


Figure S2. Expression ratio of the *LSM4* gene in the mutant strains *MCY4/ScISM4Δ1*, *MCY4/ScLSM4* compared to the wild-type strain *CML39-11A*. RNA was extracted from exponentially growing cells in YPD medium, and the housekeeping gene *TDH3* was used as the calibrator. The mean of the fold change (expressed as $2^{-\Delta\Delta Ct}$) of two biological replicates was plotted. Error bars represent the standard deviation. *p-value<0.05.

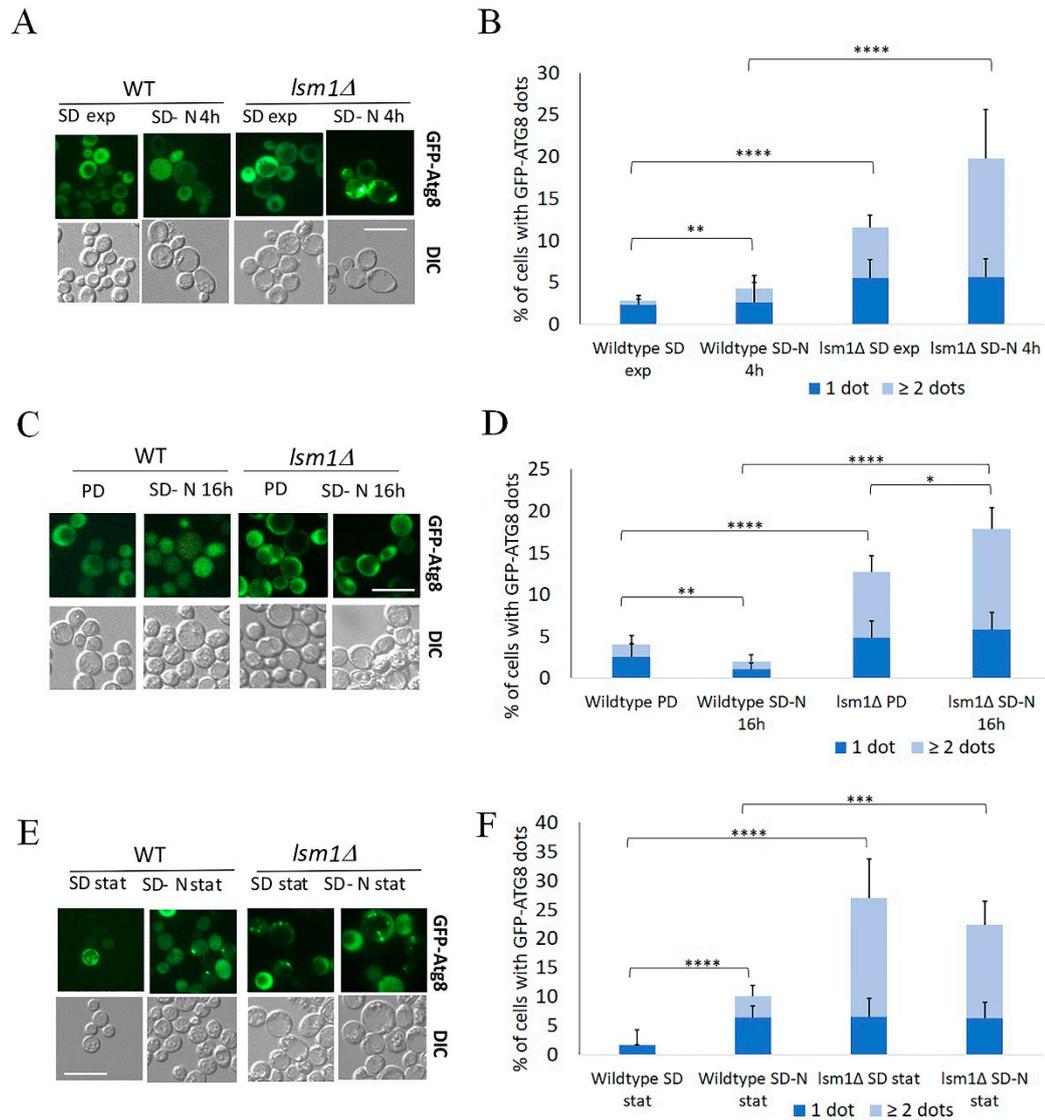


Figure S3. *lsm1Δ* mutant shows defects in autophagy-related structures transport to the vacuole, as indicated by a higher percentage of GFP-ATG8 dots in the cytoplasm during nitrogen starvation and CLS. Wild-type BMA38 and mutant *lsm1Δ* cells expressing the fusion protein GFP-ATG8 were observed at the fluorescence microscope during the exponential phase in both SD and SD-N medium for 4 hours (A), during the post-diauxic phase (PD) and in SD-N for 16 hours (C) and after 3 days of growth in SD (SD stat) or SD-N (SD-N stat) (E). GFP-Atg8 dots per cell were quantified from three biological replicates ($n \geq 300$ cells), and the mean of cells containing one or ≥ 2 dots was plotted in (B), (D), and (F). Error bars represent standard deviation. * p -value <0.05 ** p -value <0.01 *** p -value <0.001 **** p -value <0.0001

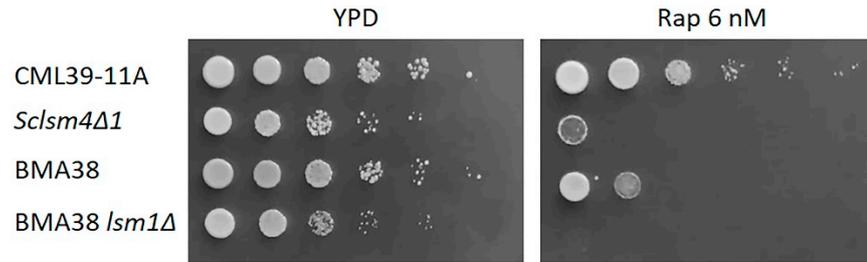


Figure S4. *Lsm1Δ* mutant shows high sensitivity to rapamycin at 6 nM, as demonstrated for the *Sclsm4Δ1* mutant. 10-fold dilution of MCY4 expressing the *Sclsm4Δ1* mutant, the *lsm1Δ* mutant, and their wild types (CML39-11A and BMA38) were spotted on YPD solid media containing 6 nM rapamycin and incubated at 28°C for 3 days. YPD was used as a growth control.

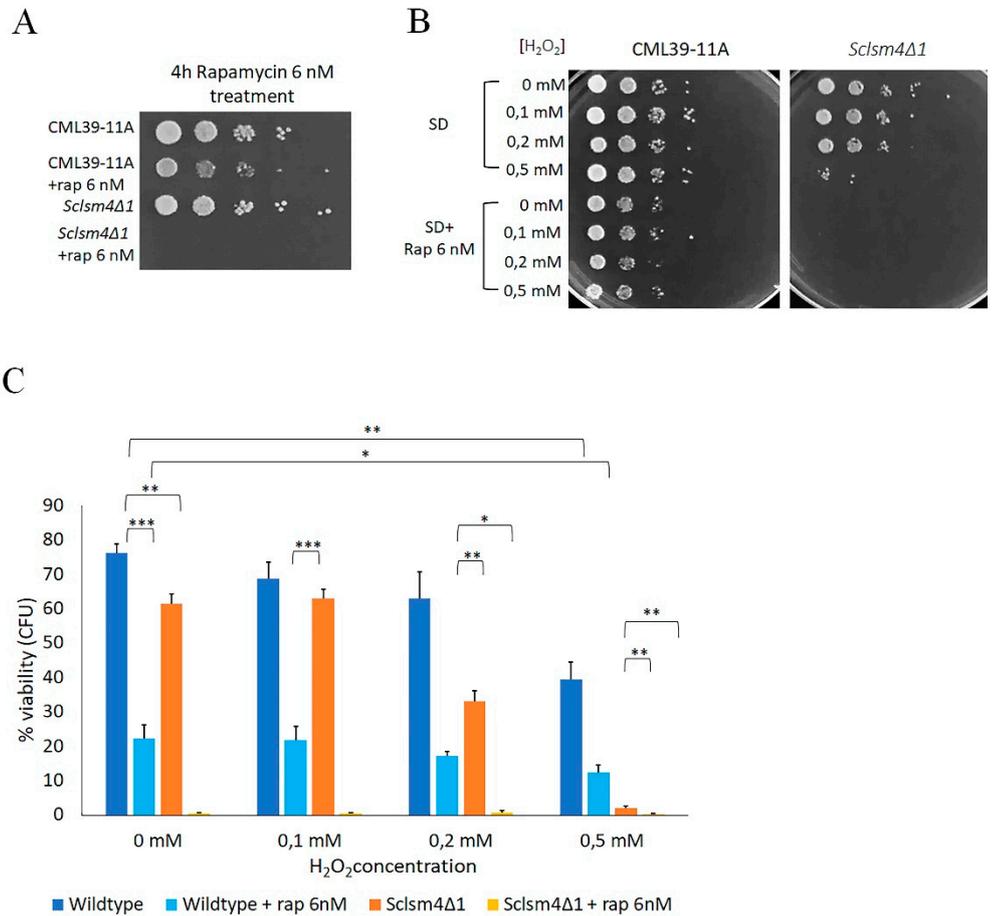


Figure S5. Treatment with a low dose of rapamycin does not protect the cells from oxidative stress. Cell viability of the CML39-11A (wild type) and *Sclsm4Δ1* mutant was measured after exposure to H₂O₂ at the indicated concentrations for 4 hours. 6 nM rapamycin was added 4 hour prior to exposure to H₂O₂. (A) 10-fold dilutions were spotted on complete solid media YPD after 4 hours of incubation in SD and SD + rapamycin 6 nM, and plates were incubated at 28°C for 3 days. (B) Treated and untreated

samples with rapamycin 6 nM were spotted in 10-fold dilution on complete solid media YPD after 4 hours of incubation with the indicated concentration of H₂O₂, and plates were incubated at 28°C for 3 days. (C) Cell viability was calculated as the percentage of microcolony forming cells. Data are represented as the mean of three independent experiments ± standard deviation. *p-value <0.05, **p-value <0.01***p-value<0.001.