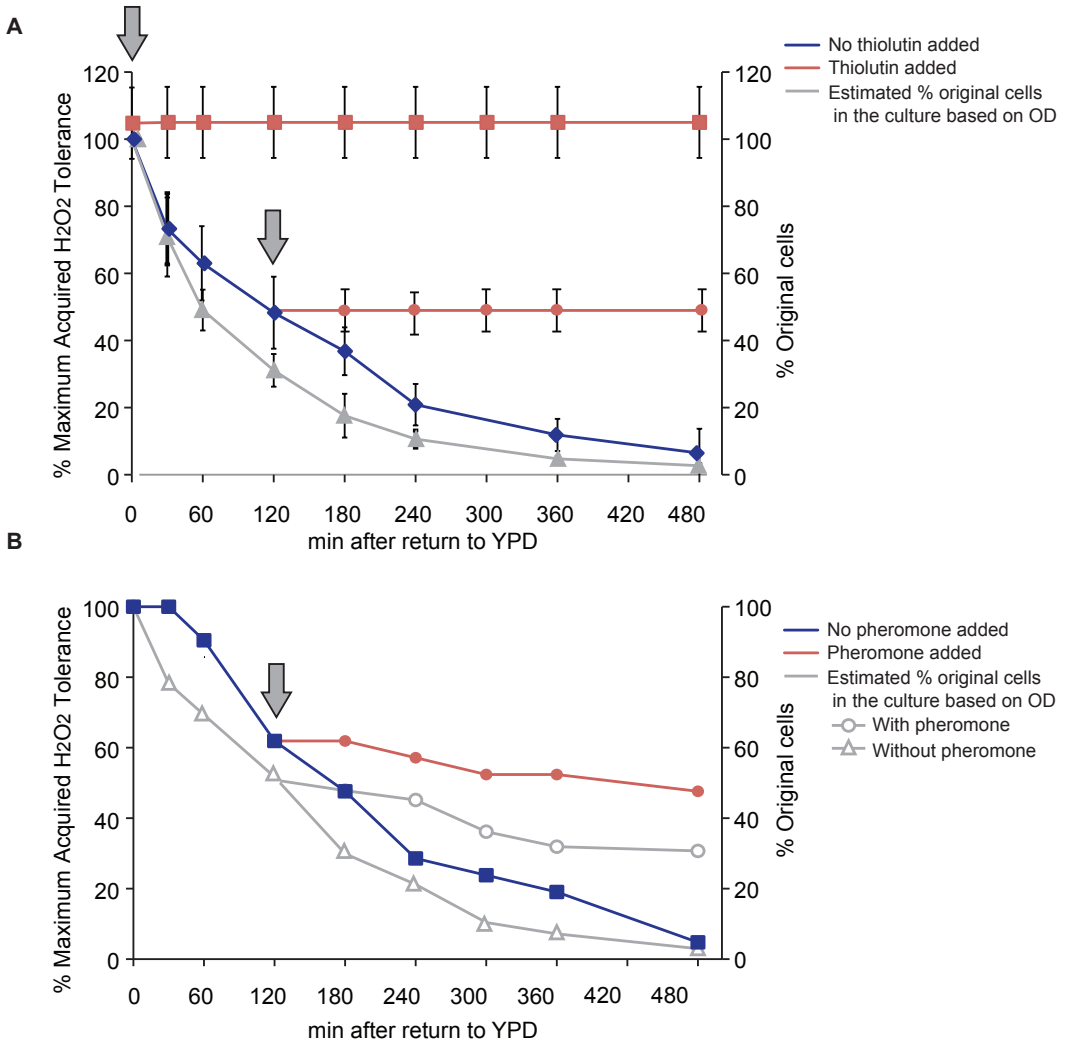

Figure S1 Memory decay is dependent on cell division but not protein synthesis. Cells were exposed to 0.7 M NaCl for 60 min and returned to stress-free YPD medium for growth, and H_2O_2 tolerance was measured throughout the experiment as described in Materials and Methods. (A) Thiolutin was added to the medium immediately after (red squares) or 120 min after (red circles) removal from NaCl treatment, and the relative resistance to H_2O_2 was scored over 480 min. Blue line: H_2O_2 resistance in cells with no thiolutin added, grey line: percentage of original stressed cells in the population. (B) A similar experiment was conducted, except that 10 µM alpha factor was added 120 min after cells were returned to YPD growth. Relative resistance to H_2O_2 is shown as: red line closed circle (with alpha factor), or blue line closed square (without alpha factor). The percentage of original stressed cells in the culture (inferred based on optical density) is shown as: grey line open circle (with alpha factor), or grey line open triangle (without alpha factor). Black arrow represents time of addition of thiolutin or alpha factor.

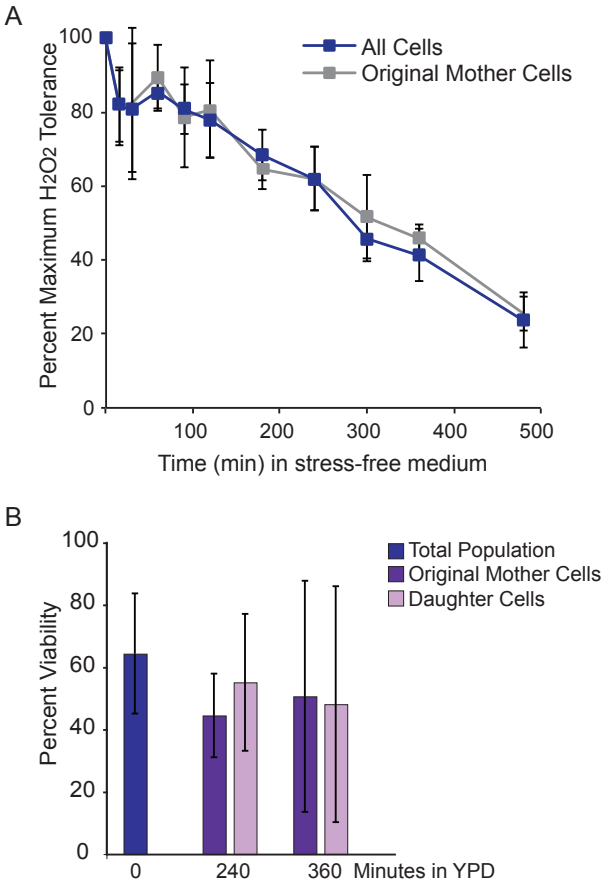

Figure S2 Daughter cells inherent acquired stress resistance. Resistance to 1mM H_2O_2 was scored in UCC8613 cells exposed to 0.7M NaCl for 60 min then returned to YPD with 1 µM estradiol to mark daughter cells as adenine auxotrophs (ade-). In this strain, the adenine biosynthesis gene *ADE2* is flanked by LoxP sites, while an estradiol-activated CRE recombinase is expressed via the bud-specific transcription factor Ace2p. Upon addition of estradiol, the bud-specific recombinase excises *ADE2* only in daughter cells. This renders daughter cells permanently auxotrophic for adenine (ade^-), a phenotype that can be conveniently distinguished by the red coloration of ade^- cells. Estradiol-treatment rendered more than 80% of daughter cells ade^-, while less than 3% of cells spontaneously lost *ADE2* in the absence of estradiol. (A) Cells were exposed to NaCl for 60 min and then resuspended in fresh YPD medium; 1 µM estradiol was added either immediately or after ~2 generations in stress-free medium (at which point we estimate ~75% of cells had never directly experienced NaCl). Cell viability was scored by plating cells on YPD to measure all cells (blue curve), or on SC-adenine to measure mother cells (grey curve). (B) Cell viability was also scored from YPD plates by counting red (ade-) colonies arising from daughter cells and white (ade+) colonies generated by mother cells. Data represent the average and standard deviation of at least biological triplicates. Results were indistinguishable if estradiol was added immediately after cell transfer to YPD or after 2 generations of YPD growth (data not shown).

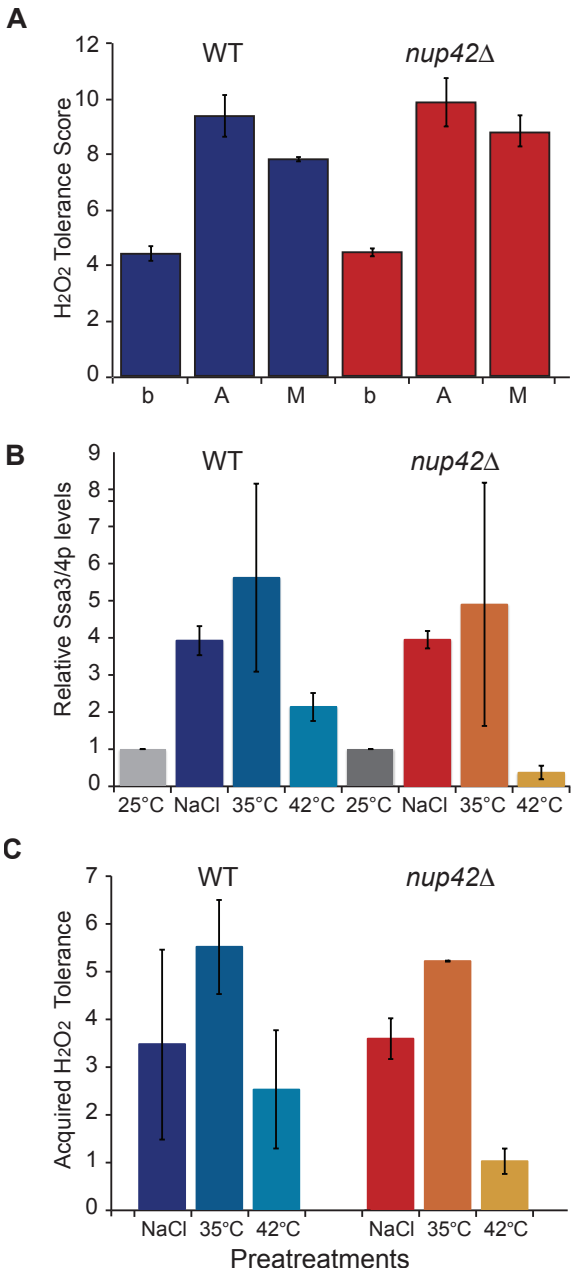

Figure S3 Characterization of the *nup42Δ* mutant. (A) H_2O_2 tolerance was measured as described in Figure 1 in wild type and *nup42Δ* mutant cells before ('b') or at 60 min after treatment with 0.7M NaCl ('A'), and in cells with a memory at 180 min after return to stress-free medium ('M'). The sum viability score across the 11 doses of H_2O_2 is shown, and data represent the average and standard deviation of biological triplicates. In all cases, the mutant was indistinguishable from the wild type cells ($p > 0.1$). (B) Levels of heat-shock factor Ssa3/4p were measured by Western analysis (and normalized to an internal Act1p control in each lane) in cells grown at 25°C and then shifted to either 0.7 M NaCl or fresh medium preheated to 35°C or 42°C for 60 min. Data represent the average of biological duplicates. (C) Sum-viability across 11 doses of H_2O_2 is shown relative to the comparable score in mock-treated cells to represent the level of acquired stress resistance 60 min after 0.7M NaCl, a 25-35°C heat shock, or a 25-42°C heat shock. Together, the data show that the *nup42Δ* mutant behaves like wild type after mild heat or NaCl treatment but not after a severe 25-42°C heat shock.

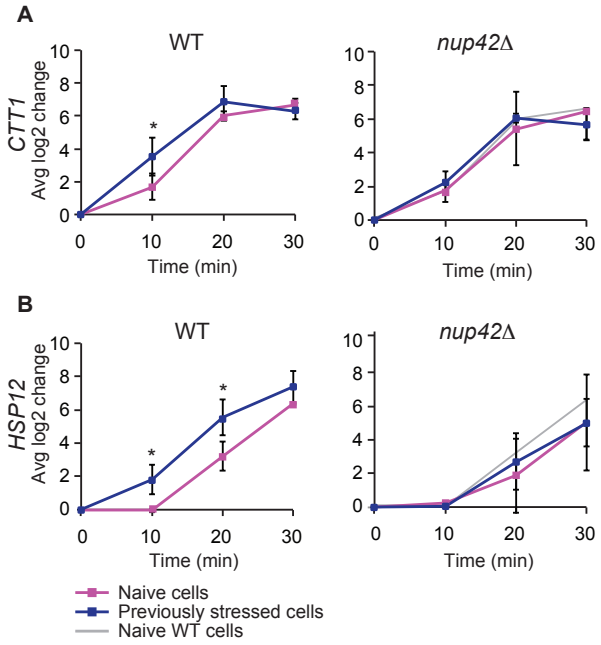

Figure S4 Transcriptional memory at *CTT1* and *HSP12*. As shown in Figure 5 for wild type and *nup42Δ* cells.

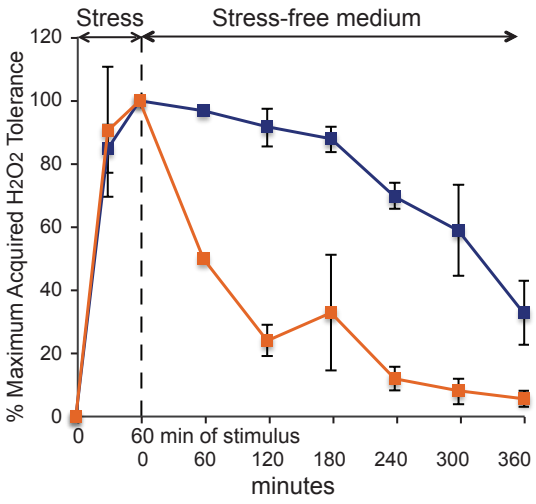

Figure S5 Memory of H_2O_2 resistance after heat shock. H_2O_2 tolerance was scored as described in Figure 1, in cells harboring FLAG-tagged *CTT1* exposed to at 24º – 37ºC heat shock (orange curve) and then returned to 30ºC degree stress-free medium. The response to 0.7 M NaCl is shown for reference (blue curve).