

SUPPLEMENTAL MATERIAL for

Roles of Filamentation Signaling Pathways in Regulating Adhesion-Dependent Surface Responses in Yeast

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Figure S1. Colony pattern formation on different media. Wild-type and the indicated deletion mutants were grown on the indicated media for the indicated times. At right, close up of several example colonies.

Figure S2. Additional examples of colony pattern formation on different media. Wild-type and the indicated deletion mutants were grown on the indicated media for the indicated times. At right, close up of several example colonies.

Figure S3. Average ruffles per radius for full time-course. The average number of ruffles per time point counted in wild-type colonies and the indicated mutants at 1 day intervals for 8 days. The experiment was performed with six replicates. Error bars represent the standard deviation between experiments.

Figure S4. Sample generation for RNAseq and initial comparisons. A-D) Models of the pathways and protein complexes examined in the study. Details of the pathways have been described previously and are adapted here (STERNER *et al.* 1999; ZAMAN *et al.* 2008; CULLEN AND SPRAGUE 2012; JAZWINSKI AND KRIETE 2012). Not all proteins that comprise or regulate the pathways or protein complexes are shown. Key regulators tested here have been underlined. **E)** Representative images of colonies harvested for comparative RNAseq. All samples were compared against each other. **F)** Venn diagram shows distribution of differentially expressed targets among mutants. Differential expression defined by $|\log_2(\text{Fold Change})| > 0.585$ and $p\text{-value} < 0.01$. Diagram shows abundance of pathway-specific and shared targets.

Figure S5. Regulatory feedback among network nodes. A) Heat map showing regulatory feedback among indicated regulators and regulatory pathways in the signaling network. **B)** Diagram showing regulatory patterns of the RTG, RAS, fMAPK, and SAGA nodes, based on the supplemental data in *Fig. S5A*.

Figure S6. Distribution of *ras2Δ* and *rtg3Δ* targets. Heat map showing targets differentially regulated in the *ras2Δ* or *rtg3Δ* mutants with $p\text{-value} < 10^{-12}$.

Figure S7. Citric acid cycle components regulated by the RAS and RTG pathways. KEGG pathway map showing regulation of indicated citric acid cycle components with differential regulation in the *ras2Δ* or *rtg3Δ* mutants. Blue shading indicates down

regulation in *ras2* Δ (left), *rtg3* Δ (right), or both (solid). Numbers are Enzyme Commission numbers.

Figure S8. Distribution of *dig1* Δ and *ste12* Δ targets.

Heat map showing targets differentially regulated in the *dig1* Δ or *ste12* Δ mutants with p-value $< 10^{-12}$.

Figure S9. Distribution of plate specific targets by role. Pie chart showing distribution of functional classification of genes. Boxes show the ranking and gene name for a selection of targets with > 45 -fold increase in expression.

Figure S10. Deletion mutants of major colony-specific targets. **A)** Wild-type and indicated mutant colonies were grown on YEP-Gal agar media and photographed. **B)** Wild-type and indicated mutants from *Fig. S10A* were examined after plate washing. Washed images are shown as inverted images for ease of viewing.

Figure S11. Effect of low oxygen on colony growth. Wild-type, *dig1* Δ , and *ste12* Δ were plated onto normal YEPD media (2% Glu) or excess glucose (8% Glu) agar media at three levels of oxygen: anaerobic, low oxygen, and normal oxygen. Colony size was measured over six days.

Figure S12. Effect of surface-specific stresses on the phenotypes of mutants lacking target genes. Indicated strains were grown in the indicated stress conditions and normal conditions.

SUPPLEMENTAL VIDEOS

Supplementary Video 1. Time-lapse photography of wild-type mats. Mat formation by wild-type cells (PC538). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 2. Time-lapse photography of *flo11Δ* mats. Mat formation of *flo11Δ* cells (PC1029). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 3. Time-lapse photography of *dig1Δ* mats. Mat formation of *dig1Δ* cells (PC3039). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 4. Time-lapse photography of *ste12Δ* mats. Mat formation of *ste12Δ* cells (PC1079). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 5. Time-lapse photography of *ras2Δ* mats. Mat formation of *ras2Δ* cells (PC562). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 6. Time-lapse photography of *rtg3Δ* mats. Mat formation of *rtg3Δ* cells (PC3642). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 7. Time-lapse photography of *spt8Δ* mats. Mat formation of *spt8Δ* cells (PC4008). OD $A_{600} = 20$ cells were grown on YEP-Gal semi-solid agar media, at 22°C for 8 days. Photographs were taken every 30 min.

Supplementary Video 8. Penetration of a wild-type *S. cerevisiae* colony by *C. elegans*, example 1. A *C. elegans* (N2) worm was placed onto YEPD semi-solid agar media containing a wild-type *S. cerevisiae* mat (PC538).

Supplementary Video 9. Penetration of a wild-type *S. cerevisiae* colony by *C. elegans*, example 2. A *C. elegans* (N2) worm placed onto YEPD semi-solid agar media with a wild-type *S. cerevisiae* mat (PC538)

Supplementary Video 10. Penetration of a *flo11Δ* *S. cerevisiae* colony by *C. elegans*, example 1. A *C. elegans* (N2) worm placed onto YEPD semi-solid agar media with a *flo11Δ* *S. cerevisiae* mat (PC1029).

Supplementary Video 11. Penetration of a *flo11Δ S. cerevisiae* colony by *C. elegans*, example 2. A *C. elegans* (N2) worm placed onto YEPD semi-solid agar media with a *flo11Δ S. cerevisiae* mat (PC1029).

Supplementary Video 12. Penetration of an OP50 *E. coli* colony by *C. elegans*, example 1. A *C. elegans* (N2) worm placed onto YEPD semi-solid agar media with OP50 *E. coli* mat.

Supplementary Video 13. Penetration of an OP50 *E. coli* colony by *C. elegans*, example 2. A *C. elegans* (N2) worm placed onto YEPD semi-solid agar media with OP50 *E. coli* mat.

Supplementary Video 14. Penetration of a wild-type *S. cerevisiae* colony by *glr-1(lof)* *C. elegans*, example 1. A *C. elegans glr-1(lof)* worm placed onto YEPD semi-solid agar media with a wild-type *S. cerevisiae* mat (PC538).

Supplementary Video 15. Penetration of a wild-type *S. cerevisiae* colony by *glr-1(lof)* *C. elegans*, example 2. A *C. elegans glr-1(lof)* worm placed onto YEPD semi-solid agar media with a wild-type *S. cerevisiae* mat (PC538).

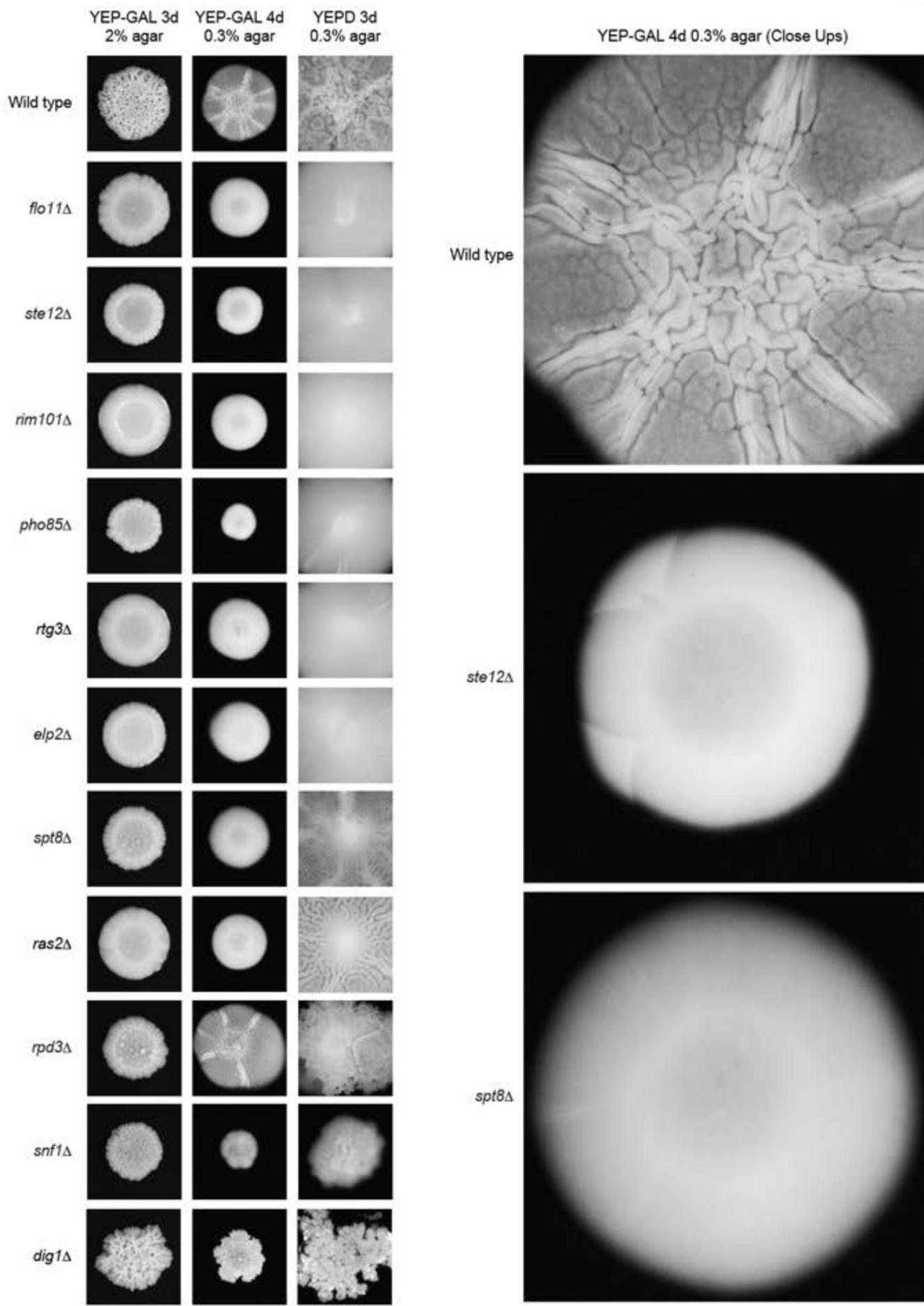
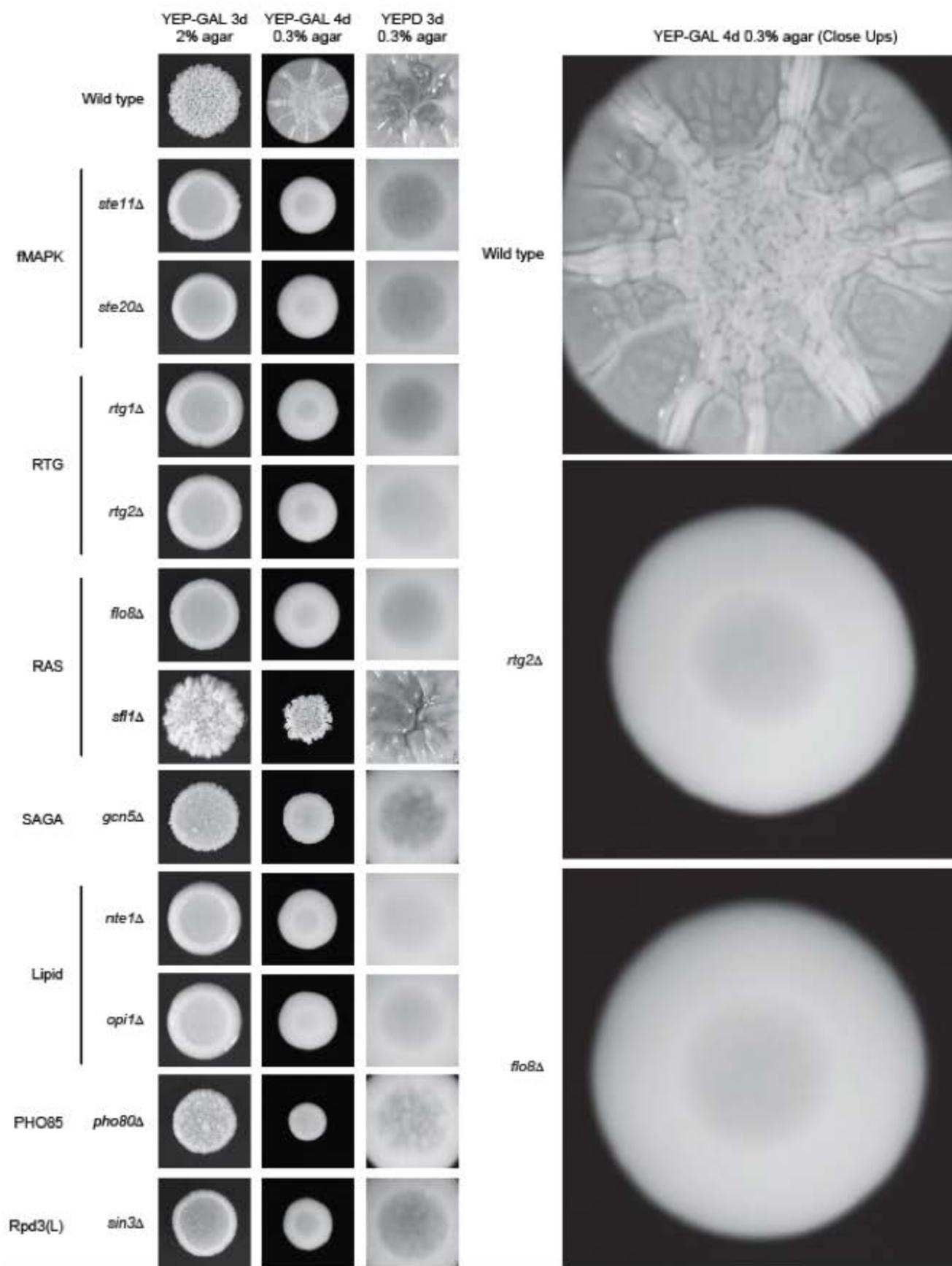
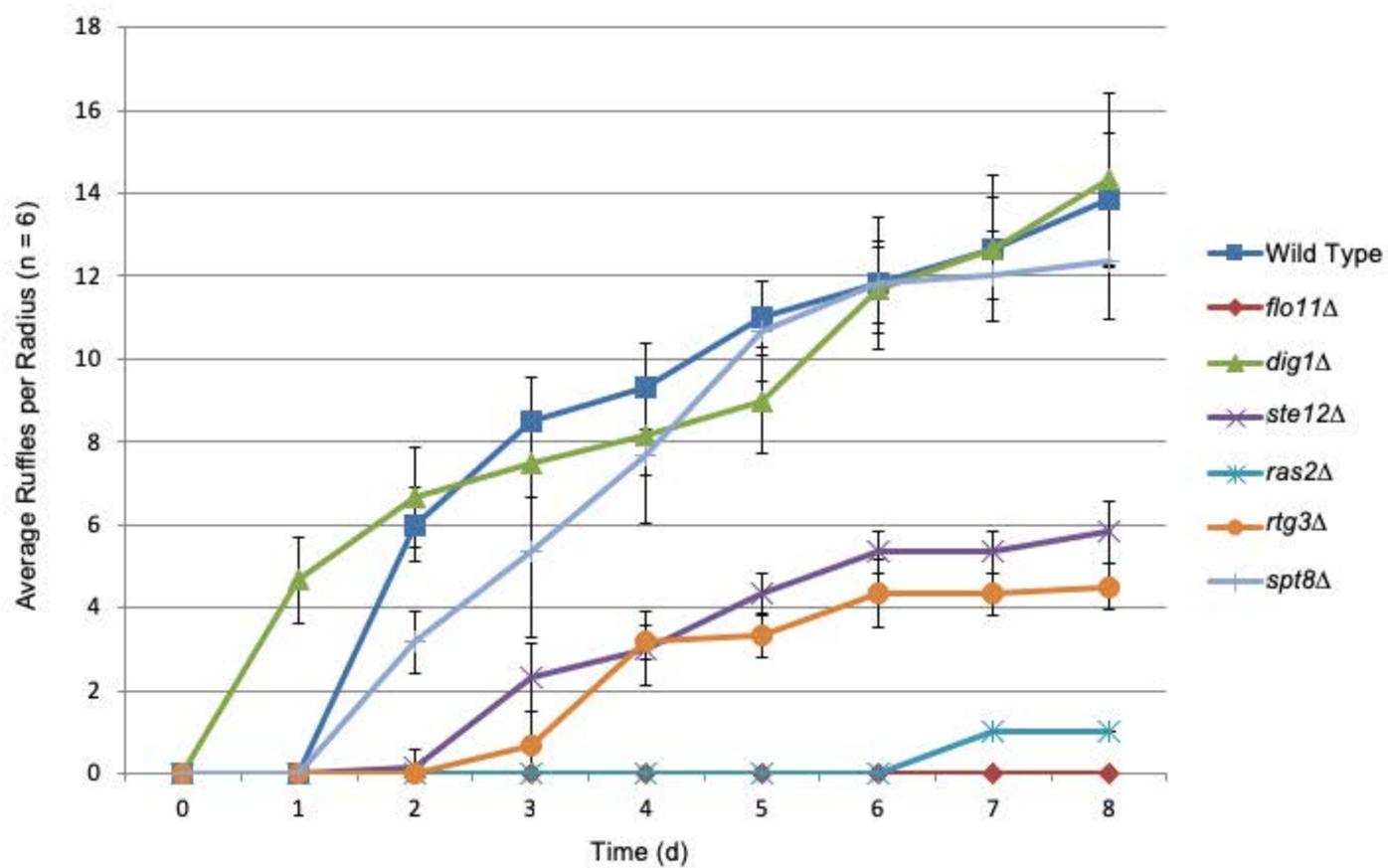
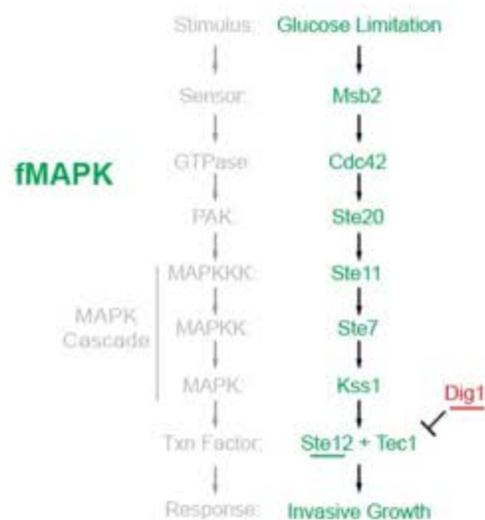


Fig._S2

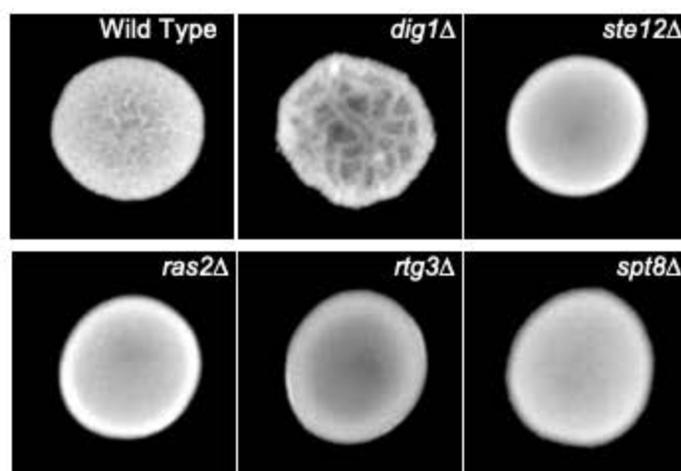




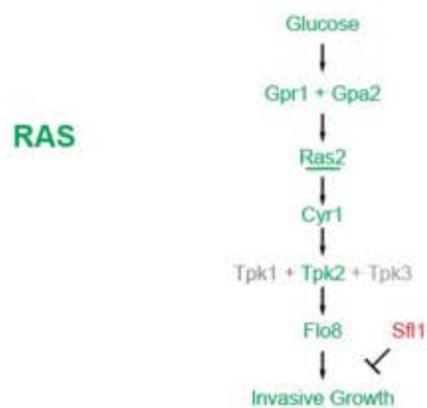
A



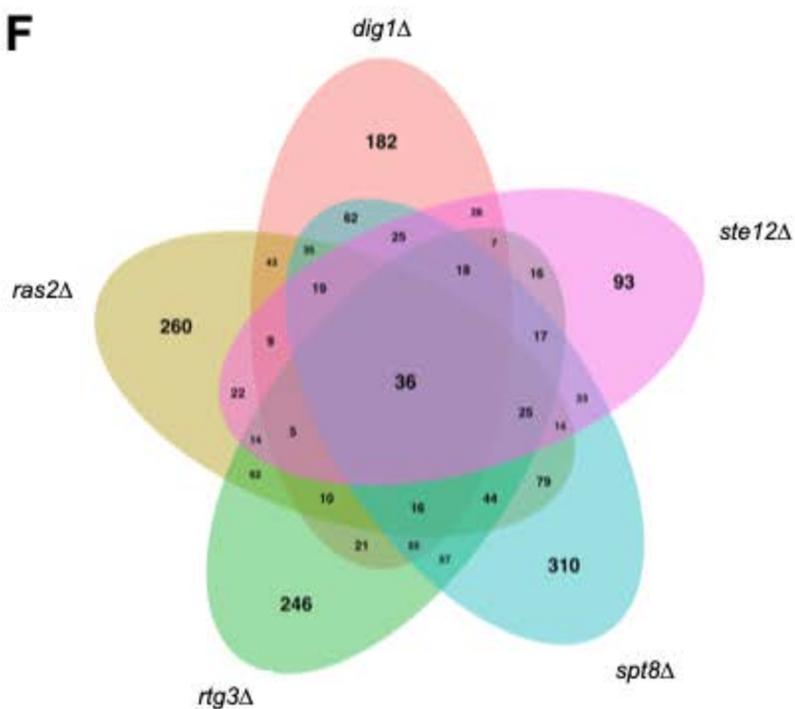
E



B

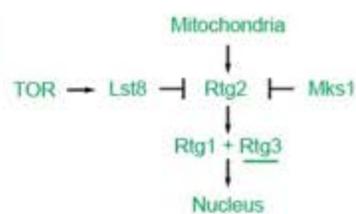


F



C

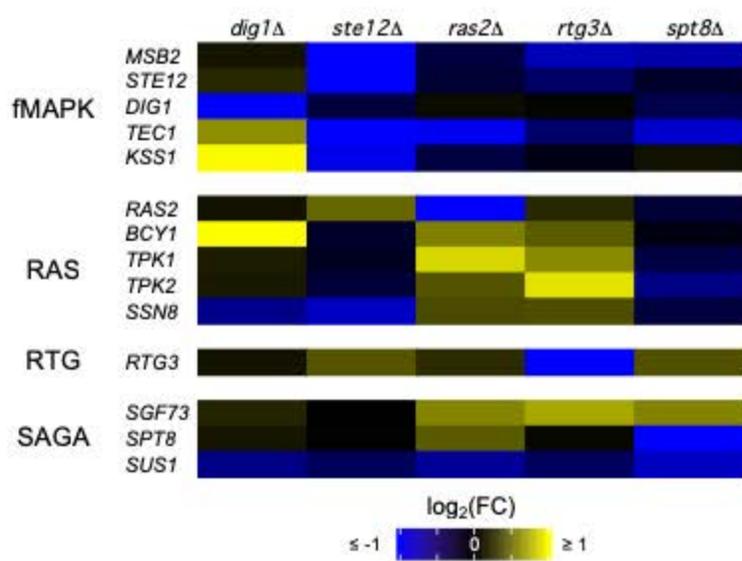
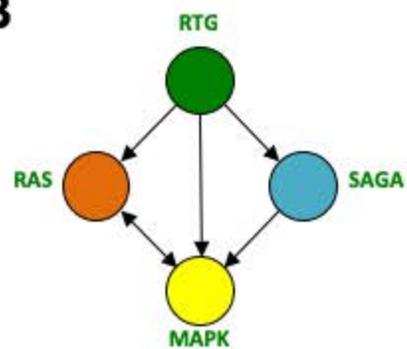
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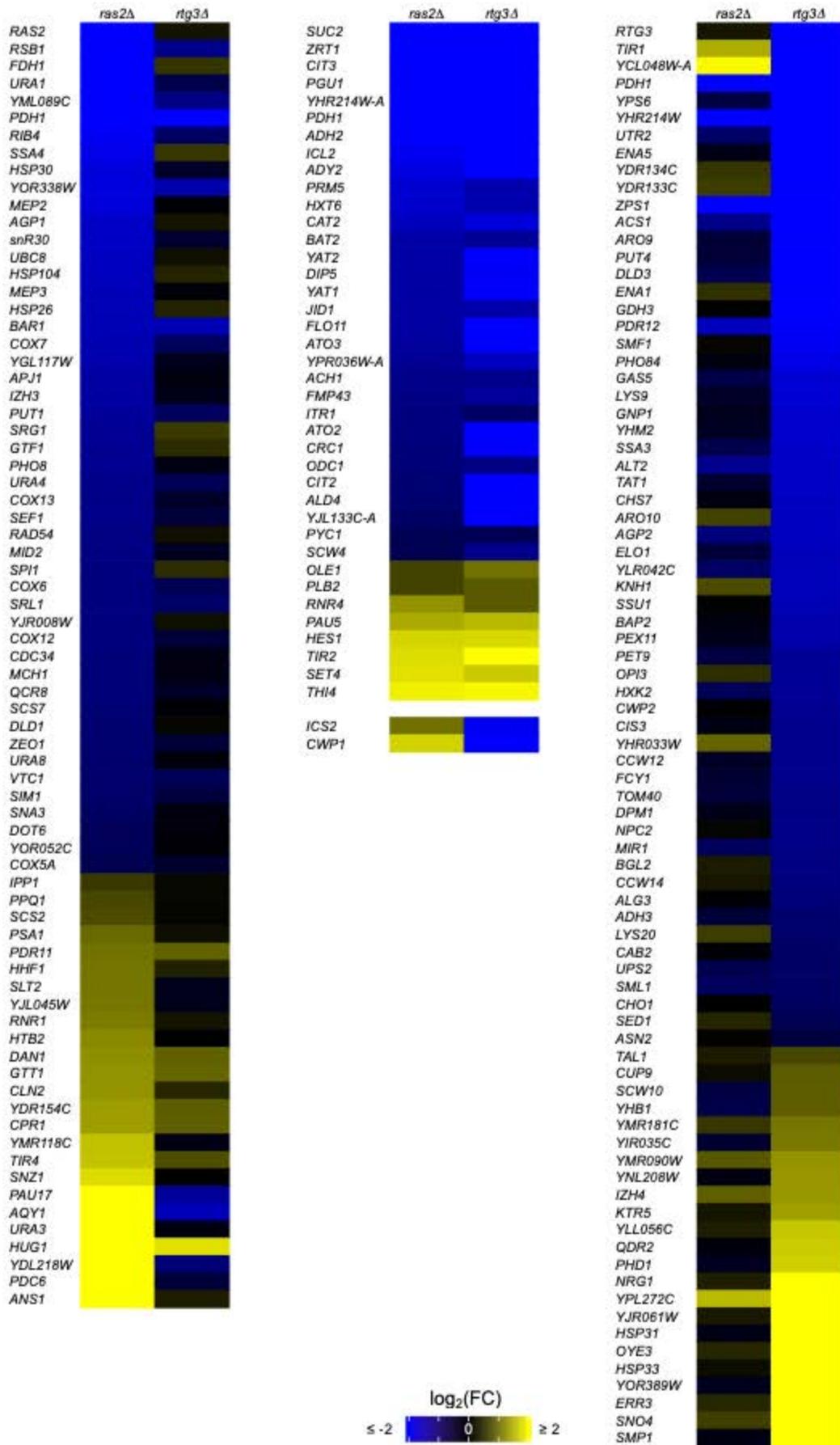


D

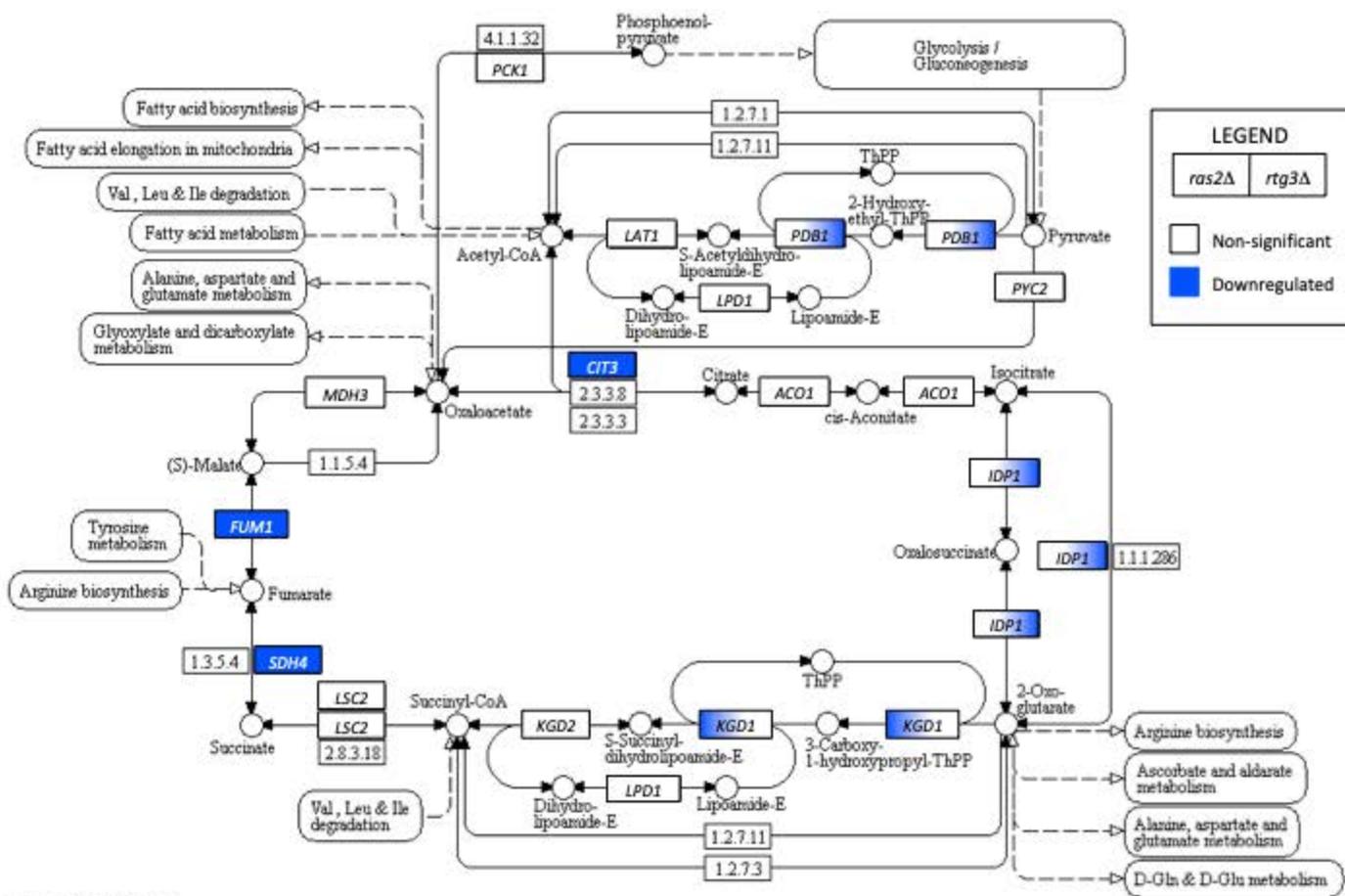
SAGA



A**B**



CITRATE CYCLE (TCA CYCLE)



Data on KEGG graph
Rendered by Pathview

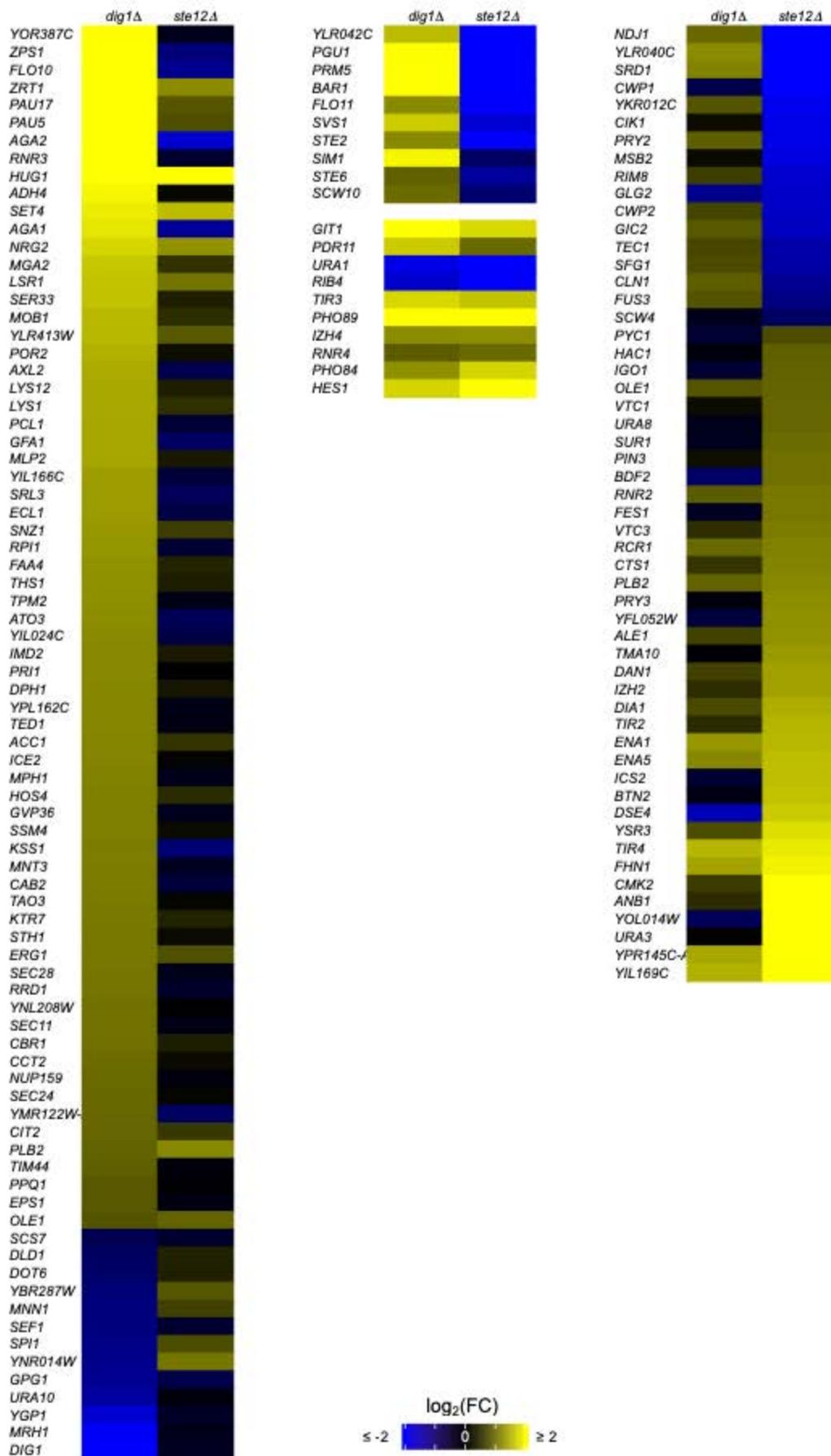
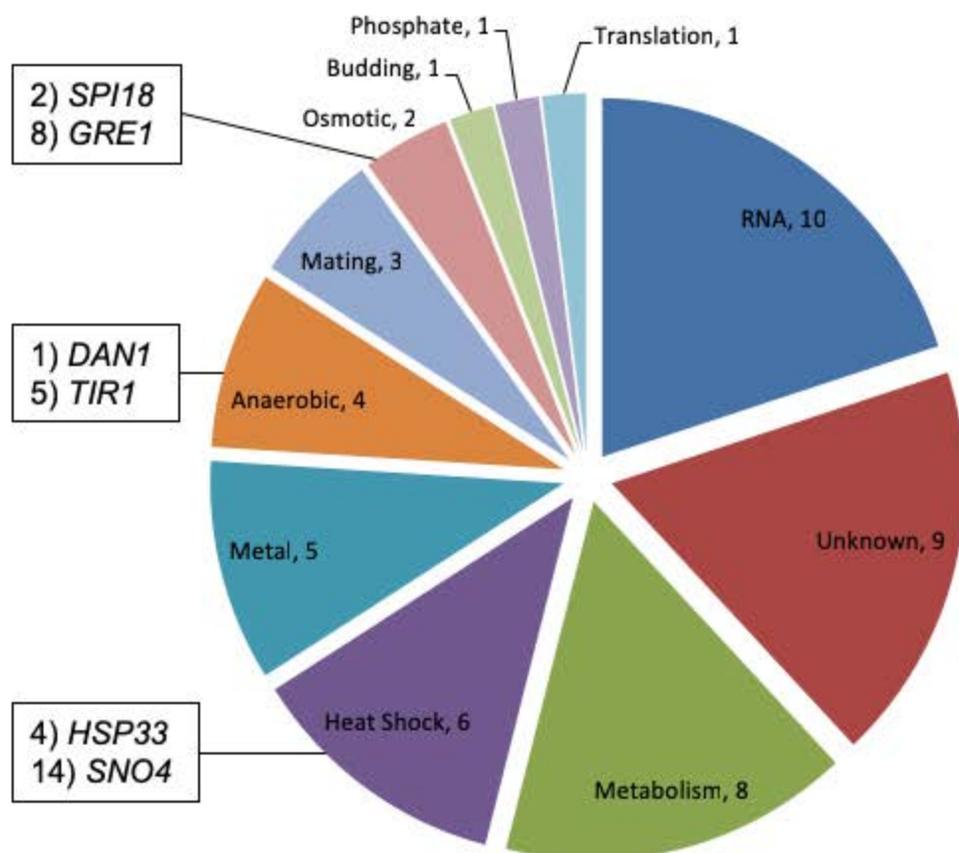


Fig. S9



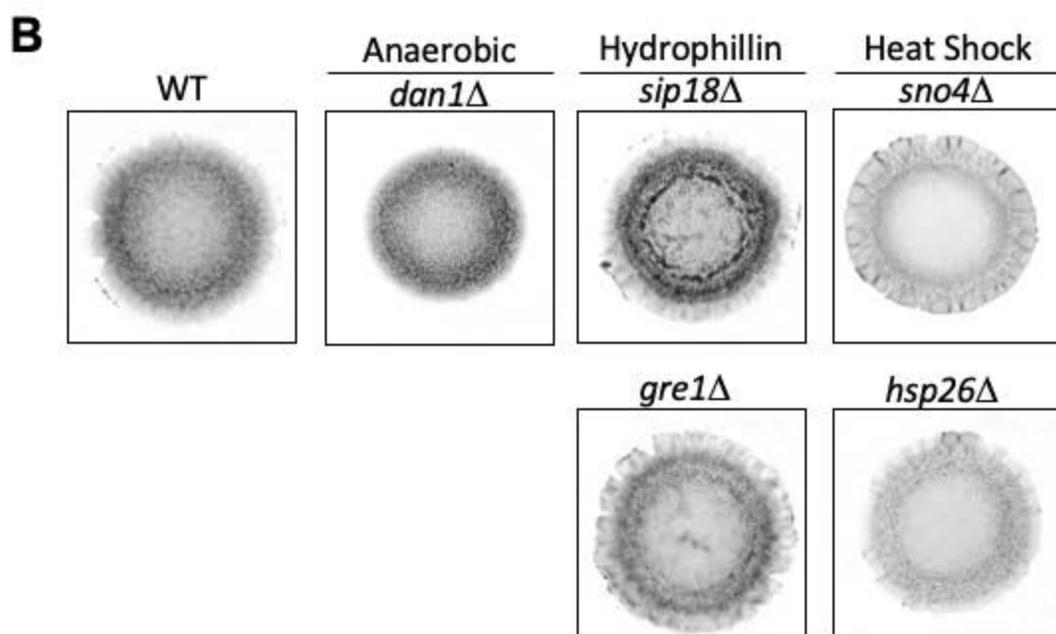
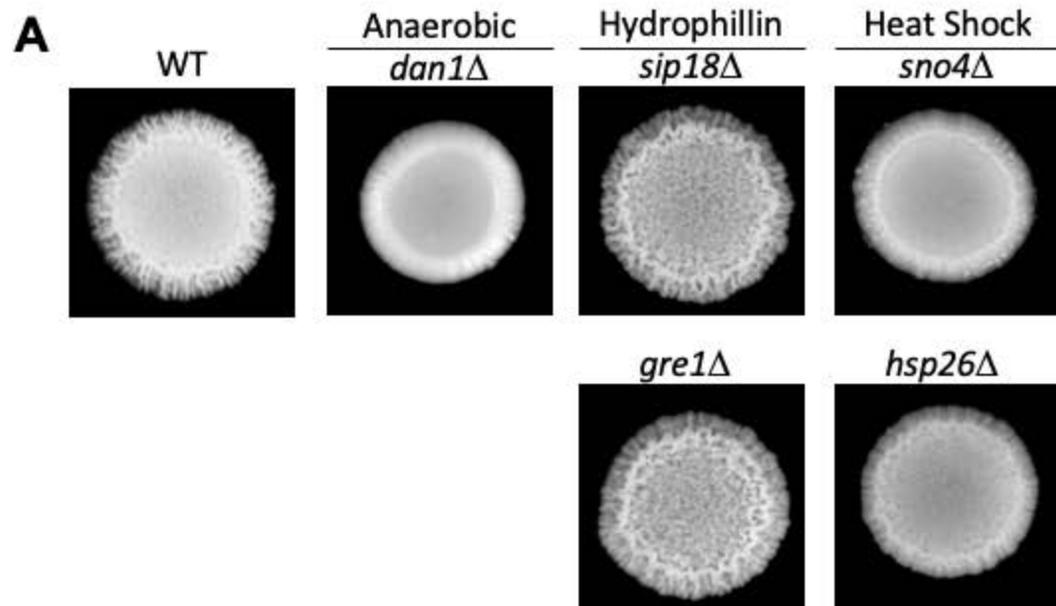


Fig. S11

