

Figure S1. Fluorescence of full-length fusions of YFP to Ump1 and Ump2 are only observed on low ammonium. Expression of the YFP in *U. maydis* was confirmed by detecting fluorescence, when intact YFP was fused to Ump1 (D) and Ump2 (H) and the cells were grown in liquid SLAD (low ammonium) for 24 hrs. Fluorescence was not observed when the same strains were grown in YEPS (rich medium), (C) and (G). Also shown above each fluorescent image is the DIC image for the respective cells (Panels (A), (B), (E), and(F)). Size bar equals 20 μ m.

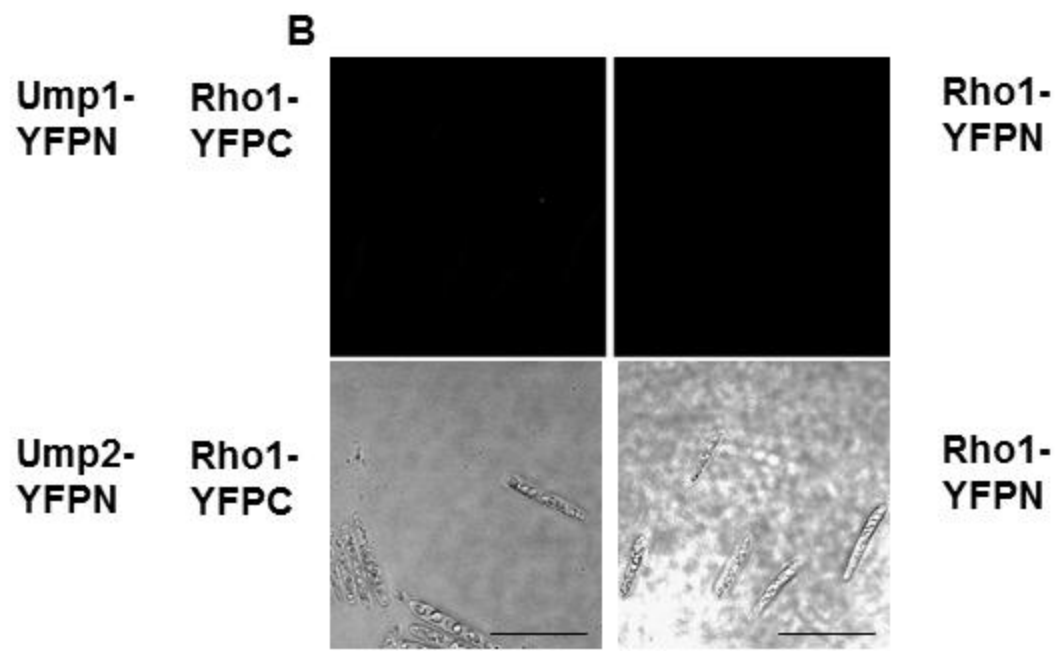
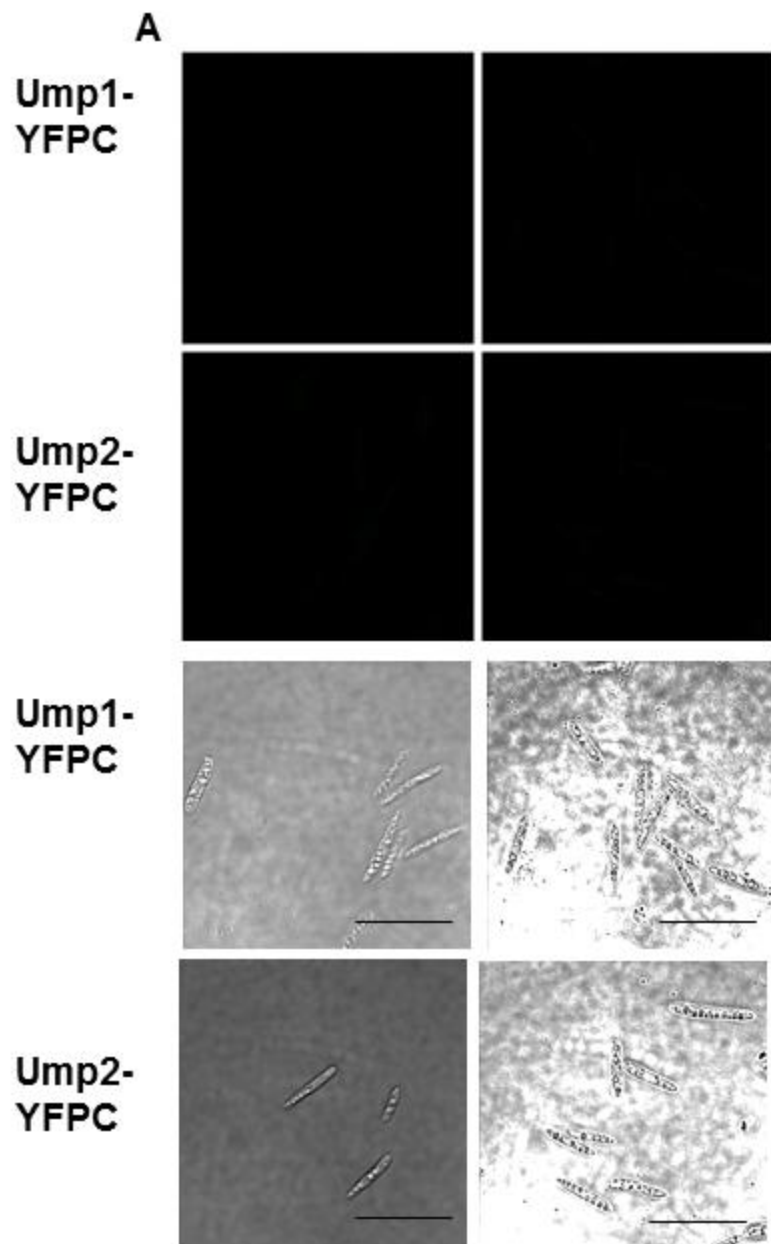


Figure S2. Fluorescence results for *U. maydis* tagged strains in the $\frac{1}{2}$ WT genetic background (40), grown in SLAD (low ammonium), (A) expressing a YFP-N or YFP-C fusion to Ump1, Ump2, or, (B) expressing a YFP-N or YFP-C fusion to Rho1. Note the absence of fluorescence in each case. Shown below fluorescence images are the corresponding DIC images. Size bar equals 20 μ m.

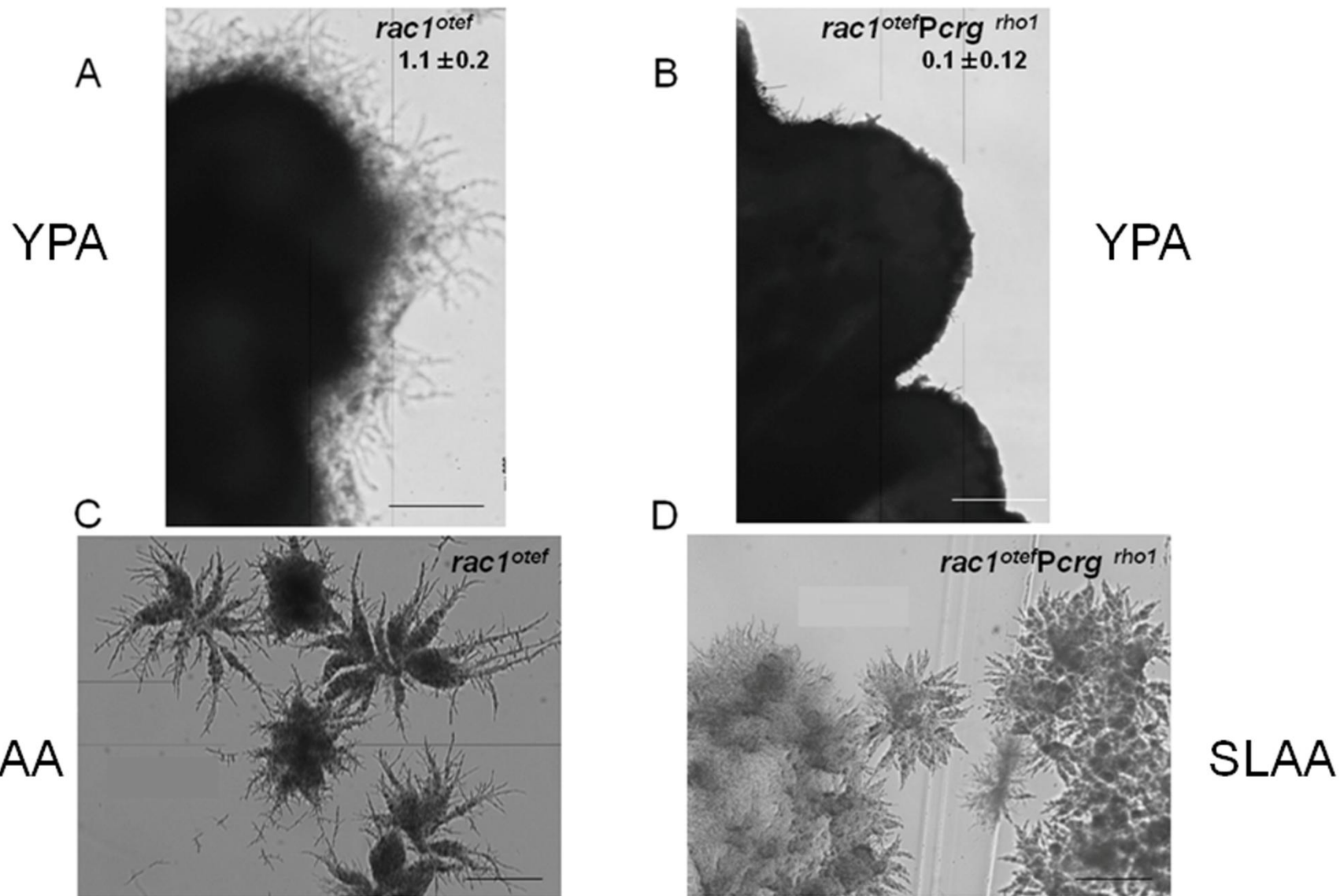
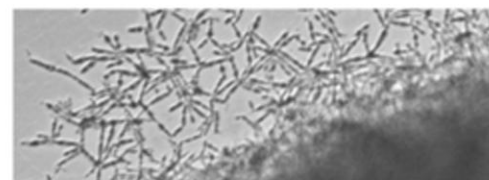
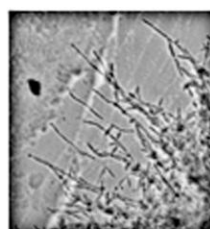
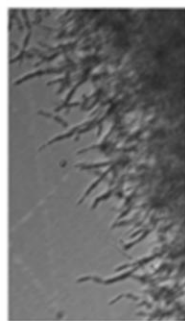
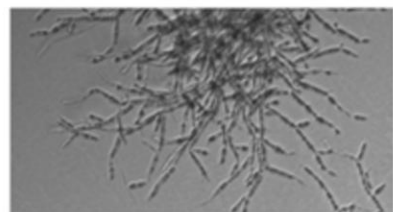


Figure S3. Effects of concomitant over-expression of *rac1* and *rho1* on filamentation of haploid cells. Shown is comparison of cells that over-express the *rac1* gene from the constitutive P_{otef} promoter (41); *rho1* gene expression is driven by the arabinose-inducible (YPA) *crg* promoter. For (A) and (C), *rac1^{otef}*; for (B) and (D), *rac1^{otef} Pcrgrho1*. Images shown for all strains are after growth for 96 hours on YPA (yeast peptone agar in which the 2% dextrose has been replaced with 2% arabinose; panels (A) and (B)) or SLAA (i.e., low ammonium agar in which the 2% dextrose has been replaced with 2% arabinose; panels (C) and (D)). Size bar equals 200 μm .

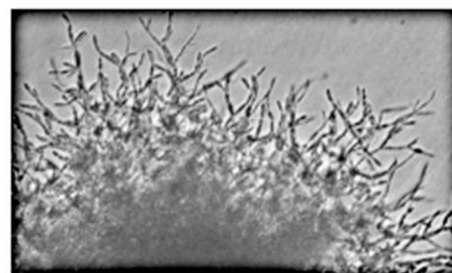
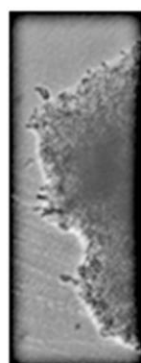
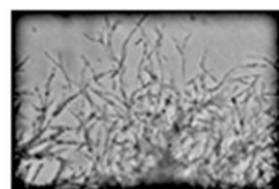


4C
1/2 + pUM

4D
1/2 + pUM-*rho1*

4E
1/2 +
ump2^{otef}

4F
1/2 + *ump2*^{otef}
+ pUM-*rho1*



6C
rac1^{otef}

6D
 Δ *ump2* + *rac1*^{otef}

6G
 Δ *ump2* *rac1*^{otef}
+ pCM-*ump2*

Figure S4. Insets for panels in Figures 4 and 6, are of colony edges at 10x magnification (vs. 4x for the main images); the inset images are not necessarily of the same colonies as in their respective main panels.