Supporting Information

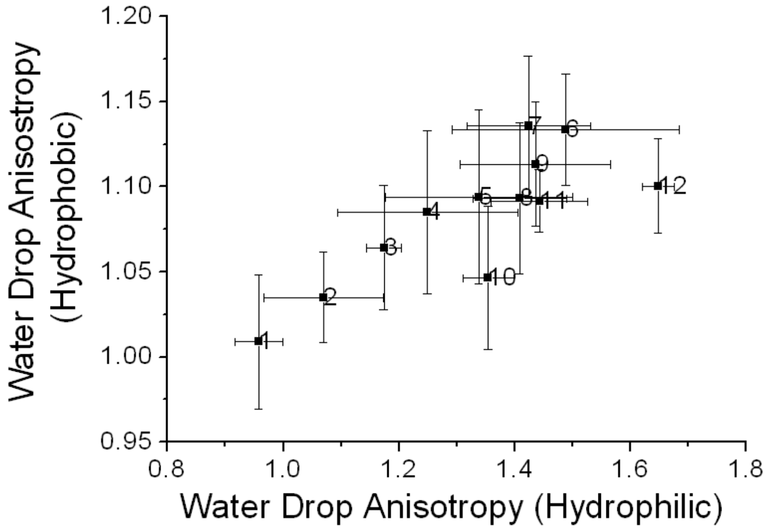
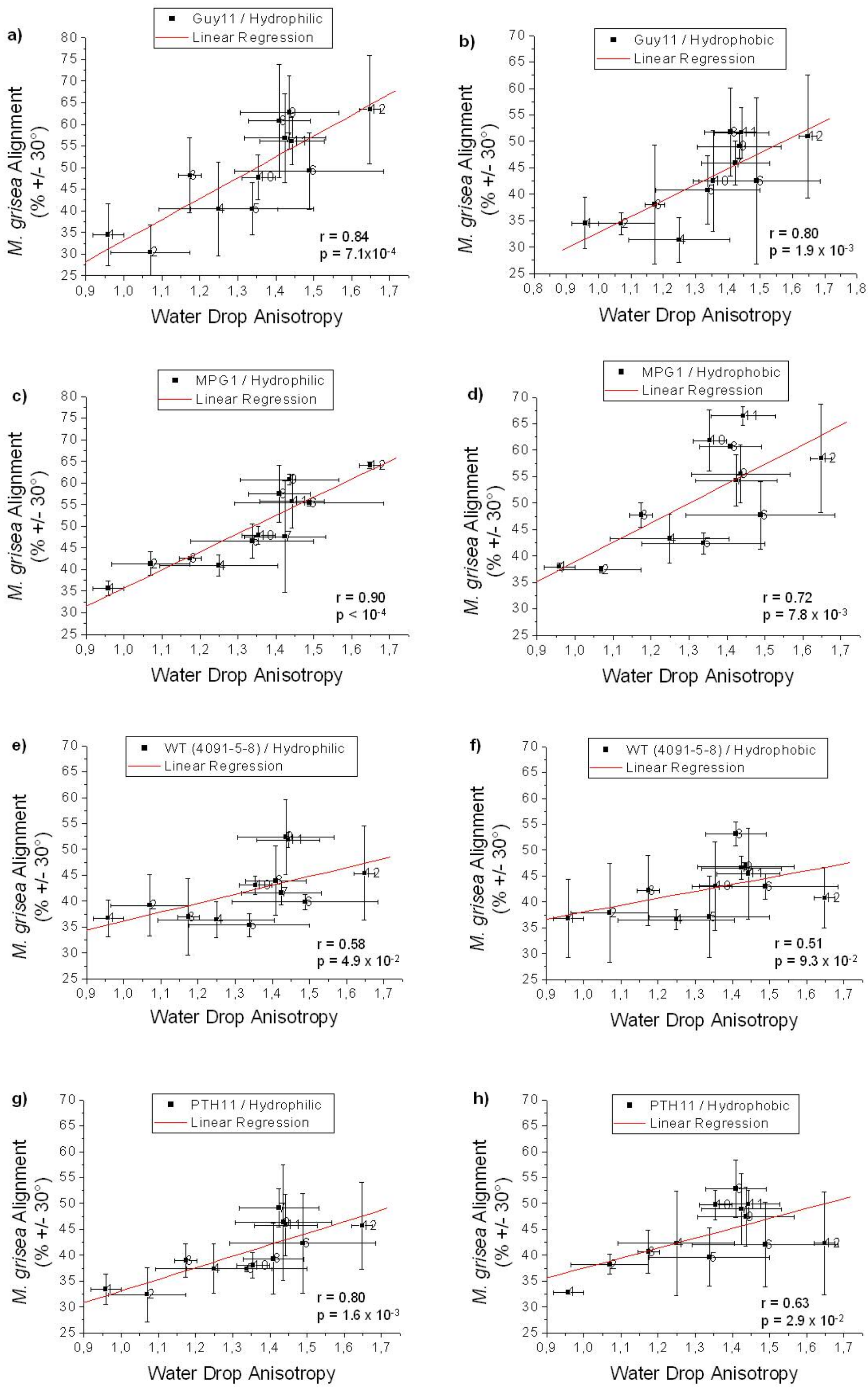


Figure S1 Water drop anisotropy measured on hydrophobic groves plotted as a function of the same measurements made on hydrophilic grooves. On hydrophobic surfaces, the water drops do not spread much, leading to a lower total anisotropy and therefore larger relative error. The deviation from the trendline for the surfaces with the largest roughest factors (#10-12) can be understood in terms of Cassie effect which leads to super-hydrophobicity [1, 2].



a)
Guy11 / Hydrophilic
Linear Regression
r = 0.84
p = 7.1x10-4
b)
Guy11 / Hydrophobic
Linear Regression
r = 0.80
p = 1.9 x 10-3
c)
MPG1 / Hydrophilic
Linear Regression
r = 0.90
p < 10-4
d)
MPG1 / Hydrophobic
Linear Regression
r = 0.72
p = 7.8 x 10-3
e)
WT (4091-5-8) / Hydrophilic
Linear Regression
r = 0.58
p = 4.9 x 10-2
f)
WT (4091-5-8) / Hydrophobic
Linear Regression
r = 0.51
p = 9.3 x 10-2
g)
PTH11 / Hydrophilic
Linear Regression
r = 0.80
p = 1.6 x 10-3
h)
PTH11 / Hydrophobic
Linear Regression
r = 0.63
p = 2.9 x 10-2
M. grisea Alignment (% +/- 30°)
Water Drop Anisotropy

Figure S2. Complete alignment data for the *M. grisea* mutants MPG1 and PTH11, as well as their corresponding wild types Guy11 and 4091-5-8, respectively. The left column shows measurements on hydrophilic grooves and the right column shows measurements on hydrophobic grooves. In all cases a perpendicular alignment is observed. In all cases except for one, a significant correlation with $p<0.05$ was observed between the water drop anisotropy and the alignment for the entire data set. In the case of the 4091-5-8 wild type on hydrophobic surfaces, exclution of the roughest data point (#12) resulted in a roughness-conditional probability of correlation <0.05.

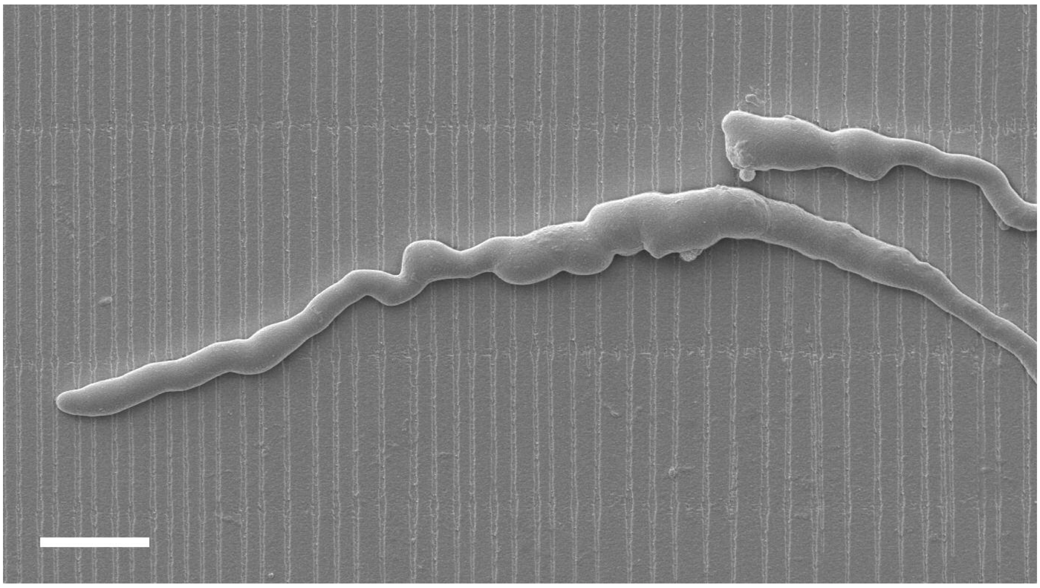


Figure S3. Cryo-SEM image of a *M. grisea* germ tube on hydrophilic grooves. Scale bar = 10 μm.

References:

1. McHale, G.; Shirtcliffe, N. J.; Aqil, S.; Perry, C. C.; Newton, M. I., Topography driven spreading. *Physical Review Letters* **2004,** 93, (3), -.
2. Feng, L.; Li, S. H.; Li, Y. S.; Li, H. J.; Zhang, L. J.; Zhai, J.; Song, Y. L.; Liu, B. Q.; Jiang, L.; Zhu, D. B., Super-hydrophobic surfaces: From natural to artificial. *Advanced Materials* **2002,** 14, (24), 1857-1860.