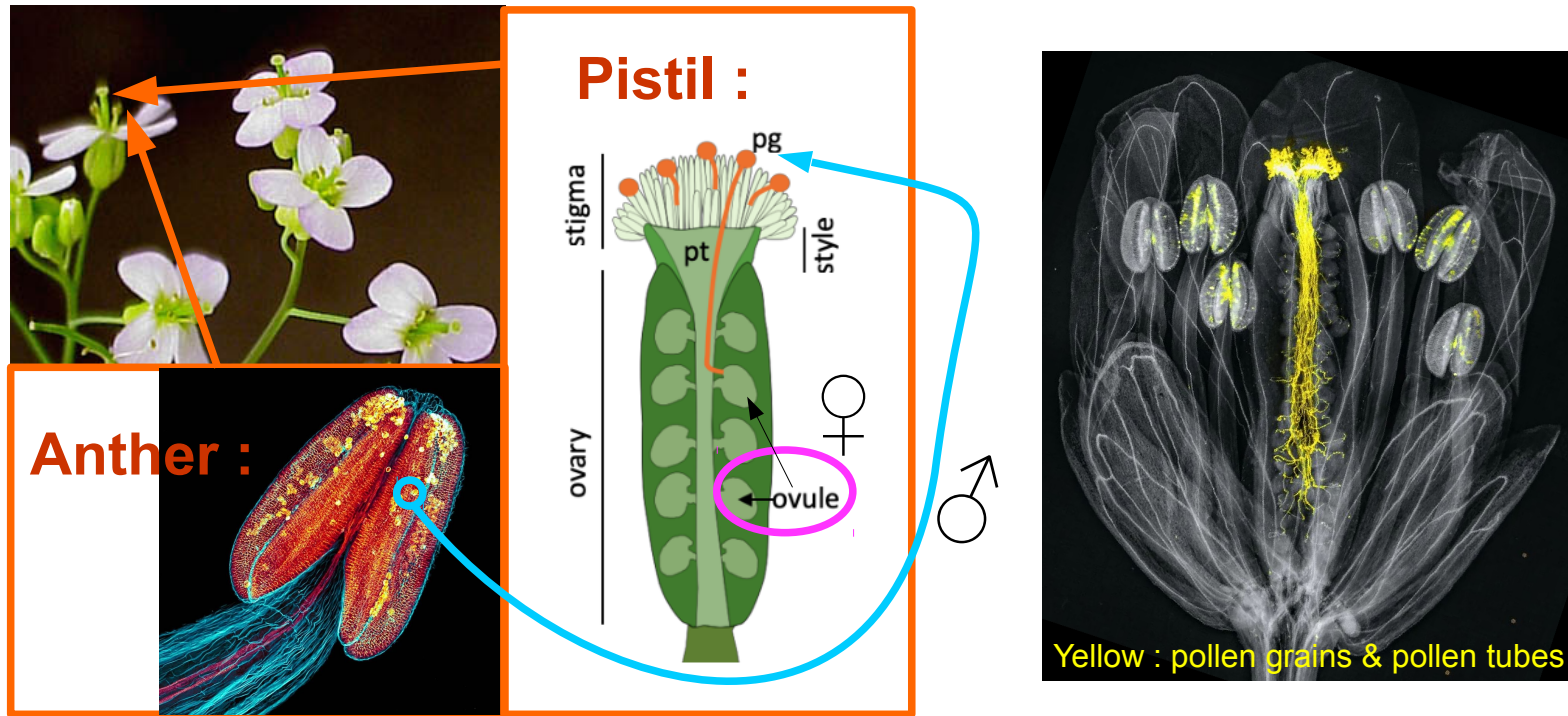
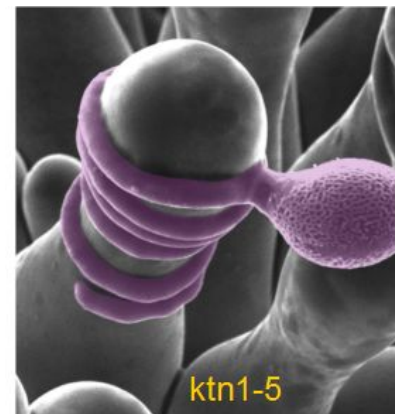
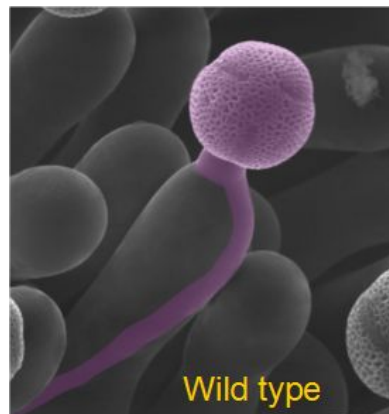


Geometric and mechanical guidance in Arabidopsis' fertilization

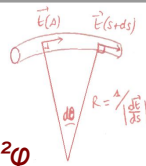
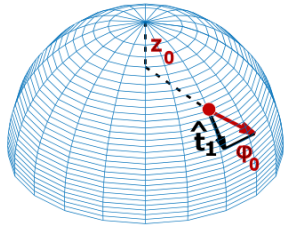
L. Riglet¹, C. Quilliet², C. Godin¹, K. John², I. Fobis-Loisy¹
¹LRP, Lyon & ²LIPhy, Grenoble



Differential growth of WT pollen tubes on WT papillas and mutant papillas :



No growth guidance
(PT follows a geodesic)



energetic penalisation $m \sin^2 \varphi$



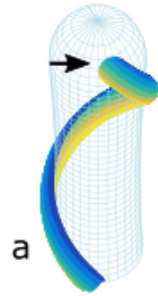
bending (« flexural ») cost $\chi |dt/ds|^2$

Adimensional guidance :

$$\mu = m \ell / \chi$$

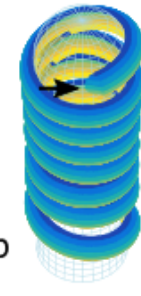
with $\ell = 2.5 \mu\text{m} \sim$ pollen radius

$z_0 = 5 \mu\text{m}$
 $\varphi_0 = 40^\circ$



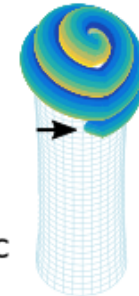
T=0.9

$z_0 = 7.5 \mu\text{m}$
 $\varphi_0 = 100^\circ$

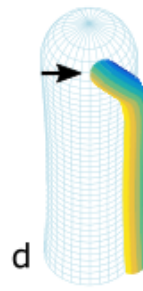
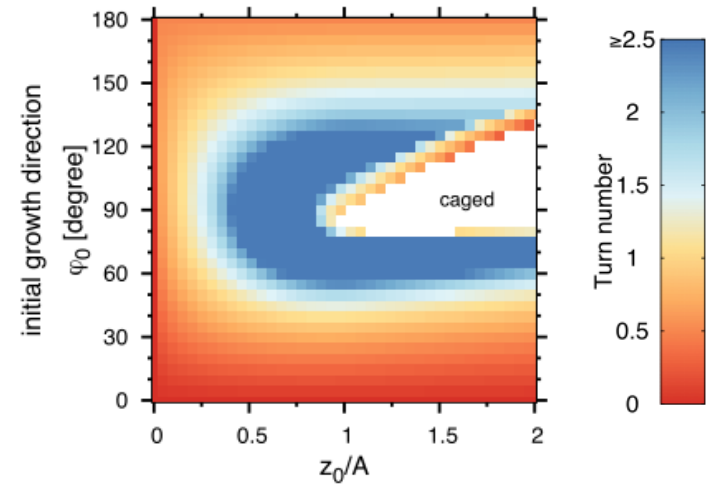


T=7.6

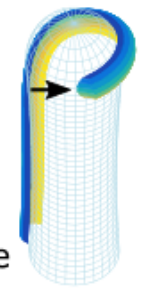
$z_0 = 15 \mu\text{m}$
 $\varphi_0 = 100^\circ$



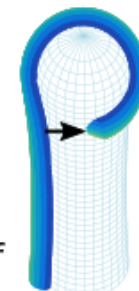
T=3.1



T=0.1

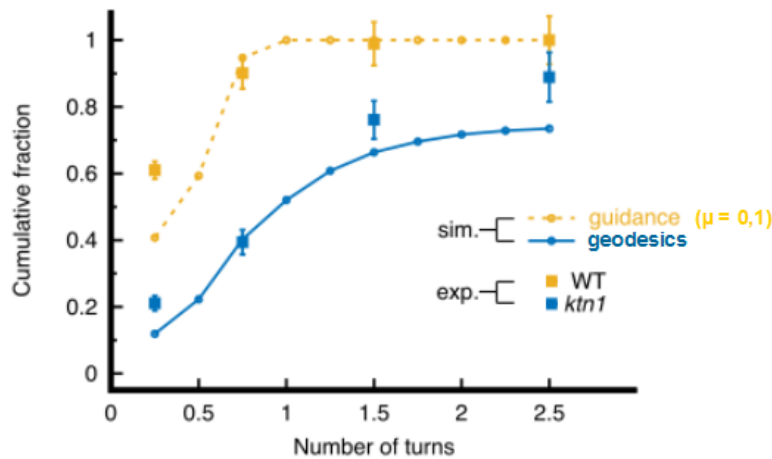
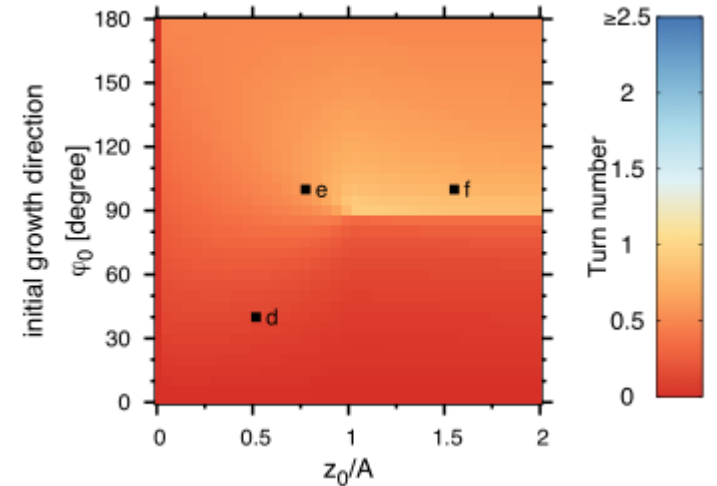


T=0.6



T=0.8

($\mu = 0,1$)



μ

