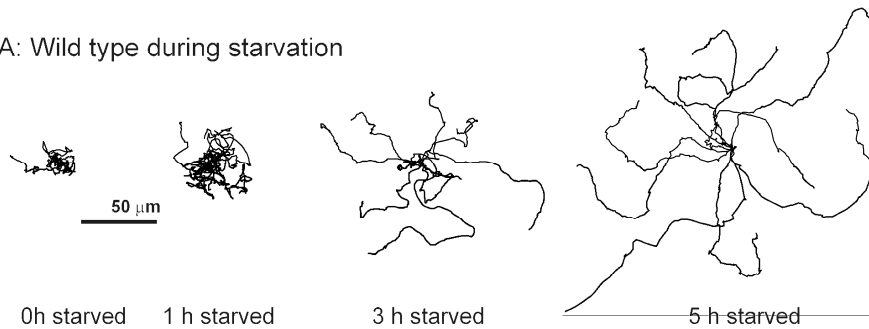
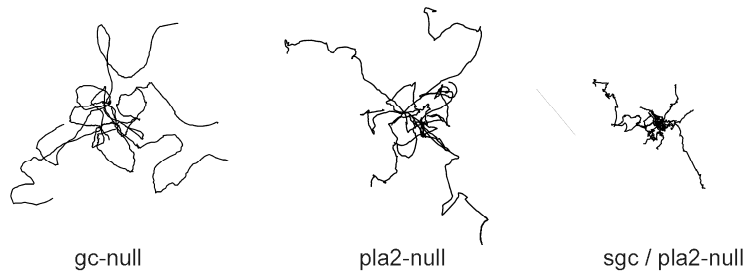


Displacement during 15 min

A: Wild type during starvation



B: 5h starved mutants



C: Monte Carlo simulations

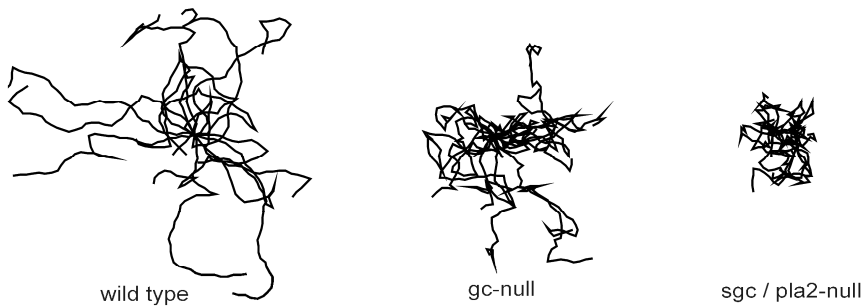


Figure S1. Trajectories. Movies were recorded during 15 minutes and the trajectories of the centroid of ten cells were determined. **A.** Wild type *Dictyostelium* cells at different times after removing of food. The frequency and size of pseudopod extension is not very different, but starved cells extend predominantly splitting pseudopodia (see (16)). **B.** Trajectories of 5 hour starved mutant cells with deletions of genes encoding guanylyl cyclases (sGC and GCA) and PLA2. **C.** Monte Carlo simulations of the trajectories calculated with the pseudopod parameters that were obtained experimentally for the mutants as indicated in Table I.