

**S6 Fig. Within-group evolutionary dynamics of groups founded by cells with genotype** $i=$ **2.** Within-group mutation selection dynamics are shown for a group founded by a cell with genotype $g\_{2}$, which actively expresses pleiotropy, $z\_{p}^{c}=1$, but no cooperation, $z\_{u}^{c}=0$, a no private trait, $z\_{v}^{c}=0$. Growth of the group as its age, $y$, increases, is logistic, with a carrying capacity $K=200$. Dynamics are shown from left to right for three different strengths of pleiotropy, $ϕ$. The vertical dashed line in (A-C) represents the point at which mutant cell lineages make up 25% of the group. Note that the strength of pleiotropy has no effect on the within-group dynamics. (A) Changes in genotype abundances, $n^{c}(y)$. (B) Changes in genotype relative frequencies, $x^{c}(y)$. (C) Changes in the average levels of cooperation, private trait expression, and pleiotropy, $\overbar{z}^{c}(y)$. (D) Differential fitness effects of loss-of-function mutations within the group. Parameters: $s^{c}=0.95$; $K=200$; $μ=0.0001$; $ν=0.01$. The code required to generate this Figure can be found at https://github.com/euler-mab/pleiotropy and https://zenodo.org/record/6367788#.YjSBVurP2Uk.