

Table S1 Mean cellular widths of the bacterial strains. Cell dimensions were determined at the indicated growth phases from confocal micrographs across three independent experiments. Values reported are mean cell widths (μm) $\pm$ standard deviation of $\geq 1\,500$ cells examined for each experiment.

Strain	Mean cell width (μm)		
	Early exponential	Onset stationary	Late stationary
Wild type	0.90 ± 0.14	0.78 ± 0.10	0.80 ± 0.12
ΔglgP	0.88 ± 0.15	0.78 ± 0.08	0.86 ± 0.12
ΔglgX	0.87 ± 0.15	0.77 ± 0.09	0.85 ± 0.13
$\Delta\text{glgP}/\Delta\text{glgX}$	0.89 ± 0.16	0.82 ± 0.12	0.86 ± 0.12
ΔmalP	0.88 ± 0.21	0.78 ± 0.12	0.83 ± 0.11
$\Delta\text{malP}/\Delta\text{glgP}$	0.88 ± 0.20	0.81 ± 0.14	0.83 ± 0.11
$\Delta\text{malP}/\Delta\text{glgX}$	0.93 ± 0.25	0.80 ± 0.12	0.94 ± 0.14
$\Delta\text{malP}/\Delta\text{glgP}/\Delta\text{glgX}$	0.90 ± 0.19	0.83 ± 0.14	0.90 ± 0.12

Table S2 Credible intervals (95 %) of the proportion of elongated cells in each strain at the different growth phases. Non-overlapping intervals indicate a significant difference between the compared strains. The parameters were estimated by fitting the proportions with a logistic regression using the HMC sampler of the software Stan.

	Strain	2.5%	50%	97.5%
Early exponential phase	Wild type	0.068	0.073	0.078
	$\Delta glgP$	0.096	0.102	0.109
	$\Delta glgX$	0.099	0.104	0.111
	$\Delta glgP/\Delta glgX$	0.112	0.119	0.126
	$\Delta malP$	0.199	0.209	0.220
	$\Delta malP/\Delta glgP$	0.219	0.231	0.243
	$\Delta malP/\Delta glgX$	0.238	0.249	0.260
	$\Delta malP/\Delta glgP/\Delta glgX$	0.184	0.193	0.202
Onset stationary phase	Wild type	0.001	0.002	0.002
	$\Delta glgP$	0.000	0.001	0.001
	$\Delta glgX$	0.001	0.002	0.003
	$\Delta glgP/\Delta glgX$	0.004	0.006	0.007
	$\Delta malP$	0.012	0.015	0.017
	$\Delta malP/\Delta glgP$	0.016	0.018	0.020
	$\Delta malP/\Delta glgX$	0.017	0.019	0.022
	$\Delta malP/\Delta glgP/\Delta glgX$	0.023	0.025	0.029
Late stationary phase	Wild type	0.003	0.004	0.005
	$\Delta glgP$	0.002	0.003	0.004
	$\Delta glgX$	0.004	0.005	0.006
	$\Delta glgP/\Delta glgX$	0.002	0.003	0.004
	$\Delta malP$	0.003	0.005	0.006
	$\Delta malP/\Delta glgP$	0.006	0.008	0.010
	$\Delta malP/\Delta glgX$	0.014	0.016	0.018
	$\Delta malP/\Delta glgP/\Delta glgX$	0.011	0.014	0.017

Table S3 Summary of the primary observations of this study. Tabular overview of each of the main sections of this study. An asterisk (*) denotes a comparison made against the WT strain. A checkmark (✓) signifies positive correspondence with a specific condition, whereas an x mark (✗) denotes the contrary.

	Strain	Growth rate, culturability and viability		
		Doubling time (minutes ± SEM)	Changes in doubling time*	Reduced culturability* Increased viability*
Early exponential phase	Wild type	32 ± 0.2		
	<i>ΔglgP</i>	32 ± 0.2	✗	✗
	<i>ΔglgX</i>	31 ± 0.5	✗	✗
	<i>ΔglgP/ΔglgX</i>	32 ± 0.3	✗	✗
	<i>ΔmalP</i>	32 ± 0.5	✗	✓
	<i>ΔmalP/ΔglgP</i>	32 ± 0.1	✗	✓
	<i>ΔmalP/ΔglgX</i>	32 ± 0.2	✗	✓
	<i>ΔmalP/ΔglgP/ΔglgX</i>	31 ± 0.4	✗	✓
Onset stationary phase	Wild type			
	<i>ΔglgP</i>			✗
	<i>ΔglgX</i>			✗
	<i>ΔglgP/ΔglgX</i>			✗
	<i>ΔmalP</i>			✗
	<i>ΔmalP/ΔglgP</i>			✗
	<i>ΔmalP/ΔglgX</i>			✗
	<i>ΔmalP/ΔglgP/ΔglgX</i>			✗
Late stationary phase	Wild type			
	<i>ΔglgP</i>			✗
	<i>ΔglgX</i>			✗
	<i>ΔglgP/ΔglgX</i>			✗
	<i>ΔmalP</i>			✓
	<i>ΔmalP/ΔglgP</i>			✓
	<i>ΔmalP/ΔglgX</i>			✓
	<i>ΔmalP/ΔglgP/ΔglgX</i>			✓

(Continued)

Table S3 | Continued

	Strain	Cell size and morphology			
		Average cell length (microns $\pm$ SD)	Phenotypic heterogeneity in length detected by microscopy	Increased production of elongated cells ^{*1}	Changes in cell width [*]
Early exponential phase	Wild type	2.60 $\pm$ 0.9	✗		
	$\Delta glgP$	2.71 $\pm$ 1.0	✗	✓	✗
	$\Delta glgX$	2.79 $\pm$ 1.0	✗	✓	✗
	$\Delta glgP/\Delta glgX$	2.82 $\pm$ 1.0	✗	✓	✗
	$\Delta malP$	3.36 $\pm$ 2.6	✓	✓	✗
	$\Delta malP/\Delta glgP$	3.41 $\pm$ 2.5	✓	✓	✗
	$\Delta malP/\Delta glgX$	3.65 $\pm$ 2.9	✓	✓	✗
	$\Delta malP/\Delta glgP/\Delta glgX$	3.25 $\pm$ 2.3	✓	✓	✗
Onset stationary phase	Wild type	1.60 $\pm$ 0.4	✗		
	$\Delta glgP$	1.61 $\pm$ 0.4	✗	✗	✗
	$\Delta glgX$	1.77 $\pm$ 0.5	✗	✗	✗
	$\Delta glgP/\Delta glgX$	1.84 $\pm$ 0.6	✗	✗	✗
	$\Delta malP$	1.88 $\pm$ 0.9	✓	✗	✗
	$\Delta malP/\Delta glgP$	1.89 $\pm$ 1.1	✓	✓	✗
	$\Delta malP/\Delta glgX$	2.04 $\pm$ 0.9	✓	✓	✗
	$\Delta malP/\Delta glgP/\Delta glgX$	2.10 $\pm$ 1.1	✓	✓	✗
Late stationary phase	Wild type	1.68 $\pm$ 0.4	✗		
	$\Delta glgP$	1.69 $\pm$ 0.4	✗	✗	✗
	$\Delta glgX$	1.80 $\pm$ 0.5	✗	✗	✗
	$\Delta glgP/\Delta glgX$	1.77 $\pm$ 0.5	✗	✓	✗
	$\Delta malP$	1.88 $\pm$ 0.6	✓	✓	✗
	$\Delta malP/\Delta glgP$	1.89 $\pm$ 0.6	✓	✓	✗
	$\Delta malP/\Delta glgX$	2.06 $\pm$ 0.8	✓	✓	✗
	$\Delta malP/\Delta glgP/\Delta glgX$	2.05 $\pm$ 0.8	✓	✓	✗

¹Based on the assumption that an elongated cell is > 4 microns.

(Continued)

Table S3 | Continued

Strain		FtsZ levels and Z-ring formation	
		Changes in percentage of cells with a Z-ring*	Altered FtsZ protein levels*
Early exponential phase	Wild type		
	<i>ΔglgP</i>	x	x
	<i>ΔglgX</i>	x	x
	<i>ΔglgP/ΔglgX</i>	x	x
	<i>ΔmalP</i>	x	x
	<i>ΔmalP/ΔglgP</i>	x	x
	<i>ΔmalP/ΔglgX</i>	x	x
	<i>ΔmalP/ΔglgP/ΔglgX</i>	x	x
Onset stationary phase	Wild type		
	<i>ΔglgP</i>		x
	<i>ΔglgX</i>		x
	<i>ΔglgP/ΔglgX</i>		x
	<i>ΔmalP</i>		x
	<i>ΔmalP/ΔglgP</i>		x
	<i>ΔmalP/ΔglgX</i>		x
	<i>ΔmalP/ΔglgP/ΔglgX</i>		x
Late stationary phase	Wild type		
	<i>ΔglgP</i>		x
	<i>ΔglgX</i>		x
	<i>ΔglgP/ΔglgX</i>		x
	<i>ΔmalP</i>		x
	<i>ΔmalP/ΔglgP</i>		x
	<i>ΔmalP/ΔglgX</i>		x
	<i>ΔmalP/ΔglgP/ΔglgX</i>		x

(Continued)

Table S3 | Continued

Strain		Glycogen aggregation and production		Protein aggregation and production	
		Increased glycogen accumulation*	Glycogen aggregates detected by microscopy	Protein aggregates detected by microscopy	Changes in protein amount ^{*1}
Early exponential phase	Wild type		x	x	
	<i>ΔglgP</i>	x	x	x	x
	<i>ΔglgX</i>	x	✓	✓	x
	<i>ΔglgP/ΔglgX</i>	x	✓	✓	x
	<i>ΔmalP</i>	x	x	x	x
	<i>ΔmalP/ΔglgP</i>	x	x	x	x
	<i>ΔmalP/ΔglgX</i>	x	✓	✓	x
	<i>ΔmalP/ΔglgP/ΔglgX</i>	x	✓	✓	x
Onset stationary phase	Wild type		✓	✓	
	<i>ΔglgP</i>	x	✓	✓	
	<i>ΔglgX</i>	x	✓	✓	
	<i>ΔglgP/ΔglgX</i>	x	✓	✓	
	<i>ΔmalP</i>	x	✓	✓	
	<i>ΔmalP/ΔglgP</i>	x	✓	✓	
	<i>ΔmalP/ΔglgX</i>	x	✓	✓	
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓	✓	✓	
Late stationary phase	Wild type		✓	✓	
	<i>ΔglgP</i>	x	✓	✓	
	<i>ΔglgX</i>	x	✓	✓	
	<i>ΔglgP/ΔglgX</i>	x	✓	✓	
	<i>ΔmalP</i>	x	✓	✓	
	<i>ΔmalP/ΔglgP</i>	x	✓	✓	
	<i>ΔmalP/ΔglgX</i>	x	✓	✓	
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓	✓	✓	

¹Observation based on relative cell mass.

(Continued)

Table S3 | Continued

		Nuclear morphology, anucleate cell production and DNA concentrations			
		Aberrant nuclear patterns detected by microscopy	Changes in anucleate cells formation*	Changes in DNA content*	Altered DNA concentration (DNA/mass)*
Early exponential phase	Wild type	✗			
	<i>ΔglgP</i>	✗	✗	✗	✗
	<i>ΔglgX</i>	✗	✗	✗	✗
	<i>ΔglgP/ΔglgX</i>	✗	✗	✗	✗
	<i>ΔmalP</i>	✓	✗	✗	✗
	<i>ΔmalP/ΔglgP</i>	✓	✗	✗	✗
	<i>ΔmalP/ΔglgX</i>	✓	✗	✗	✗
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓	✗	✗	✗
Onset stationary phase	Wild type	✗			
	<i>ΔglgP</i>	✗	✗		
	<i>ΔglgX</i>	✗	✗		
	<i>ΔglgP/ΔglgX</i>	✗	✗		
	<i>ΔmalP</i>	✓	✗		
	<i>ΔmalP/ΔglgP</i>	✓	✗		
	<i>ΔmalP/ΔglgX</i>	✓	✗		
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓	✗		
Late stationary phase	Wild type	✗			
	<i>ΔglgP</i>	✗	✗		
	<i>ΔglgX</i>	✗	✗		
	<i>ΔglgP/ΔglgX</i>	✗	✗		
	<i>ΔmalP</i>	✓	✗		
	<i>ΔmalP/ΔglgP</i>	✓	✗		
	<i>ΔmalP/ΔglgX</i>	✓	✗		
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓	✗		

(Continued)

Table S3 | Continued

	Strain	DnaA levels
		Increased DnaA protein levels [*]
Early exponential phase	Wild type	
	<i>ΔglgP</i>	x
	<i>ΔglgX</i>	x
	<i>ΔglgP/ΔglgX</i>	x
	<i>ΔmalP</i>	x
	<i>ΔmalP/ΔglgP</i>	x
	<i>ΔmalP/ΔglgX</i>	x
	<i>ΔmalP/ΔglgP/ΔglgX</i>	x
Onset stationary phase	Wild type	
	<i>ΔglgP</i>	x
	<i>ΔglgX</i>	x
	<i>ΔglgP/ΔglgX</i>	x
	<i>ΔmalP</i>	✓
	<i>ΔmalP/ΔglgP</i>	✓
	<i>ΔmalP/ΔglgX</i>	✓
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓
Late stationary phase	Wild type	
	<i>ΔglgP</i>	x
	<i>ΔglgX</i>	x
	<i>ΔglgP/ΔglgX</i>	x
	<i>ΔmalP</i>	✓
	<i>ΔmalP/ΔglgP</i>	✓
	<i>ΔmalP/ΔglgX</i>	✓
	<i>ΔmalP/ΔglgP/ΔglgX</i>	✓