Table 2. Single cell statistics of the wild type strain (mass doubling time = 100 min): experimental and simulation values (before and after parameter optimization).

	Experiment [10]	Simulation before optimization	Simulation after optimization
Mean cycle time (M)	87.00 min	86.70 ± 0.73 min	84.26 ± 0.55 min
Mean cycle time (D)	112.00 min	111.95 ± 0.77 min	114.71 ± 0.57 min
Mean T_{G1} (M)	16.00 min	24.11 ± 0.43 min	22.89 ± 0.39 min
Mean T_{G1} (D)	37.00 min	36.40 ± 1.75 min	43.41 ± 0.74 min
CV cycle time (M)	0.14	0.15 ± 0.00	0.14 ± 0.01
CV cycle time (D)	0.22	0.19 ± 0.01	0.21 ± 0.00
CV T_{G1} (M)	0.50	0.51 ± 0.01	0.49 ± 0.02
CV T_{G1} (D)	0.50	0.69 ± 0.01	0.68 ± 0.01
# complete cycles	-	1111 ± 91	1098 ± 94
Cycle failure ratio	-	0.00 ± 0.00	0.00 ± 0.00
Fitting error	-	0.14 ± 0.01	0.14 ± 0.01

Parameter optimization using the experimental data in Table 1 does not affect the overall fitting error in terms of wild type statistics (these data are not enforced during optimization). Fitting error is defined as $\sum_{k=1}^{8}|(x_k - e_k)/e_k|/8$, where x_k and e_k are the statistical data points in simulations and experiments, respectively (e_1: mean cycle time of mothers, e_2: mean cycle time of daughters, e_3: mean G1 duration of mothers, e_4: mean G1 duration of daughters, e_5: CV of cycle time among mothers, e_6: CV of cycle time among daughters, e_7: CV of G1 duration among mothers, e_8: CV of G1 duration among daughters, and x_1 through x_8 denote the simulation values for the same statistics). Simulation statistics (mean $\pm$ standard deviation) are computed from 15 independent realizations. In each realization, eight pedigrees are generated. Each pedigree of cells is initiated by a single daughter (D) or mother (M) cell. CV denotes coefficient of variation (standard deviation normalized by the mean), whereas T_{G1} represents the G1 duration. Experimental mass doubling time of 100 minutes [10] is used in the simulations. The number of failed cycles (due to event execution errors listed in Table S9) normalized by the number of complete cycles is the cycle failure ratio. Matlab script to reproduce the mean and CV values (rightmost column) is provided as File B in File S1.

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