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Supplementary Information for

Predicting microbial growth in a mixed culture from growth curve data

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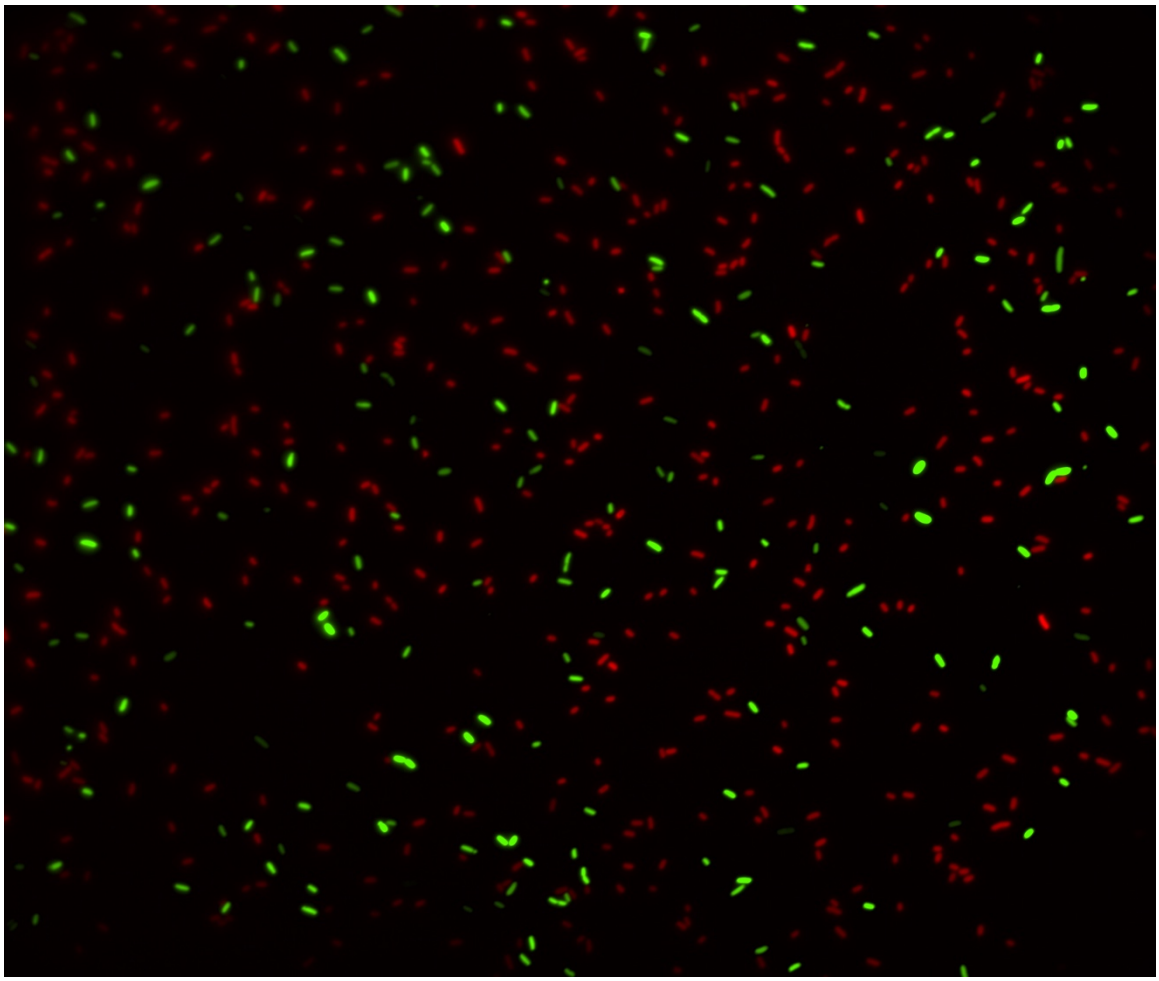

Figure S1. Fluorescence microscopy of *E. coli* strains carrying GFP or RFP. Image of a mixture of TG1-RFP (strain A1 and B1) and DH5α-GFP (strain A2 and B2) cells.

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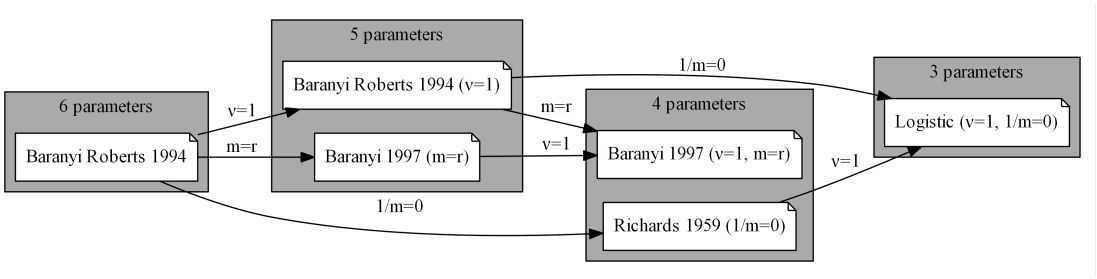

Figure S2. Growth models hierarchy. The Baranyi-Roberts model and five nested models defined by fixing one or two parameters. See **Appendix A** and **Table S1** for more details.

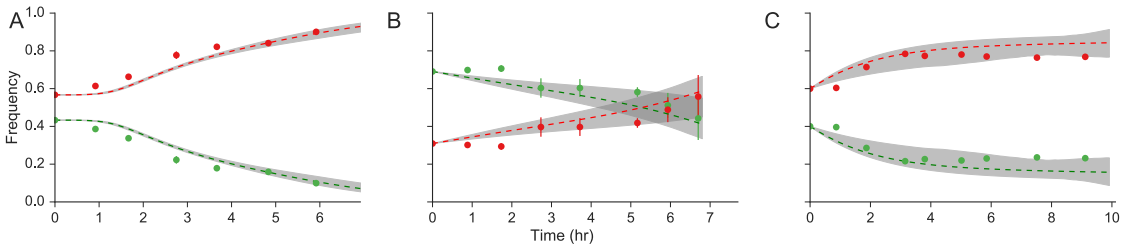

Figure S3. Mixed culture growth predictions with confidence intervals. See legend of **Figure 5** for description of the markers and lines. The gray area shows the 95% confidence interval of the best-fit model, calculated using bootstrap (1,000 samples).

Table S1. Growth models. The table lists the growth models used for fitting growth curve data. All models are defined by eqs. 1 and 2, by fixing specific parameters. N_0 is the initial population density; K is the maximum population density; r is the specific growth rate in low density; ν is the deceleration parameter; q_0 is the initial physiological state; m is the physiological adjustment rate. Note that when $m \to \infty$, the value of q_0 is irrelevant. See also the hierarchy diagram in

Figure **S2** and a detailed discussion in Appendix A.

Model name	# Parameters	Free Parameters	Fixed Parameters	References
Baranyi Roberts 1994	6	N_0, K, r, ν, q_0, m	-	(15)
Baranyi 1997	5	N_0, K, r, ν, q_0	$m = r$	-
Baranyi Roberts 1994	5	N_0, K, r, q_0, m	$\nu = 1$	-
Richards 1959	4	N_0, K, r, ν	$q_0, m \to \infty$	(48)
Baranyi 1997	4	N_0, K, r, q_0	$\nu = 1$ $m = r$	(44)
Logistic	3	N_0, K, r	$\nu = 1$ $q_0, m \to \infty$	(51)

Table S2. Estimated growth parameters.

	Experiment A		Experiment B		Experiment C	
Strain	**A1 (red)**	**A2 (green)**	**B1 (red)**	**B2 (green)**	**C3 (red)**	**C4 (green)**
Parameter						
N_0	0.124	0.125	0.23	0.286	0.204	0.188
K	0.65	0.528	0.628	0.619	0.741	0.633
r	0.587	0.376	0.484	0.304	8	8
v	1*	2.636	1.491	2.484	0.164	1*
q_0	0.008	0.032	-*	-*	0.393	0.039
m	3.735	0.937	-*	-*	0.104	0.188

* denotes fixed parameters

- denotes invalid parameter values