

**Table S1.** Maximal isotopic labeling in carbon-limited chemostats, measured after 6.9 volume turnovers, corresponding to 9.96 generations.

Label	*Mean level of maximal labeling		**CV in maximal labeling	N cells
	$X^E(^{13}\text{C})_{\text{cell}}$	$X^E(^2\text{H})_{\text{cell}}$		
20 $\mu\text{M}$ $^{13}\text{C}$ -Ara	0.7074 $\pm$ 0.0101	/	0.082	33
20 $\mu\text{M}$ $^2\text{H}$ -Glc	/	0.1386 $\pm$ 0.0047	0.190	32
10 $\mu\text{M}$ $^{13}\text{C}$ -Ara and 10 $\mu\text{M}$ $^{13}\text{C}$ -Glc	0.6874 $\pm$ 0.0056	/	0.087	113

\*mean value  $\pm$  standard error of the mean

\*\*CV in  $^{13}\text{C}$  ( $^2\text{H}$ ) excess atom fractions is 8 times (4 times) lower for maximal isotopic labeling than for the measured populations growing in carbon-limited chemostats, which are presented in Fig 1B.