





0.8 0.8 0.6 0.4 0.4 0.6 0.8 1.0 Growth rate μ (h<sup>-1</sup>)

maintenance\_fun constant

keep\_ribosome\_kcat FALSE keep\_transport\_kcat FALSE

	tC	FERM	RESP	ADPS	EAA	ENT	RNAp	DNAp	r
С	1	-0.17	-0.09	0	-0.5	-0.167	Ō	0	0
I	0	0.14	0.07	0	-0.5	0	0	0	0
AA	0	0	0	0	1	-0.167	0	0	-0.2
NT	0	0	0	-1	0	0.334	-1	-1	0
ADP	0	-0.83	-0.91	1	0	0.666	0	0	0.8
ATP	0	0.83	0.91	0	0	-0.666	0	0	-0.8
rRNA	0	0	0	0	0	0	1	0	0
DNA	0	0	0	0	0	0	0	1	0
р	0	0	0	0	0	0	0	0	0.2

tC	FERM	RESP	ADPS	EAA	ENT	RNAp	DNAp	r
0.1	0	0	0	0	0	Ō	Ō	0
0	0	0	0	0	0	0	0	0
0	0.4	4	0	4	4	0	0	0
0	0	0	0	2	0	0	0	0
0	0	0	0	0	2	0	0	2
0	0	0	2	0	0	2	2	0
0	0.1	1	0	0	0	0	0	0
0	0	0	0	0	2	0	0	2
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0
	0.1 0 0 0 0 0 0 0	0.1 0 0 0	0.1 0 0 0 0 0	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

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	tC	GLY	RESP	ADPS	EAA	ENI	RNAp	DNAp	r
x_C	0	0	0	0	0	0	Ō	Ō	0
$x_W$	0	0	0	0	0	0	0	0	0
С	0	0	0	0	0	0	0	0	0
I	0	0	0	0	0	0	0	0	0
AA	0	0	0	0	0	0	0	0	0
NT	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	0	0	0	0
ATP	0	0	0	0	0	0	0	0	0
rRNA	0	0	0	0	0	0	0	0	40
DNA	0	0	0	0	0	0	4	4	0
р	0	0	0	0	0	0	0	0	0

#### kcat

	tC	FERM	RESP	ADPS	EAA	ENT	RNAp	DNAp	r
kcatf	32	127	127	24	9	123	6	12	17
kcatb	0	0	0	0	0	0	0	0	0

#### Keq



## phi input

				[,4]						
[1,]	0.065	0.035	0.035	0.003	0.248	0.032	0.119	0.003	0.46	

average saturation input

# minimal phi constraint

[1,]

### minimal f constraint

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]
[1,]	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō	Ō