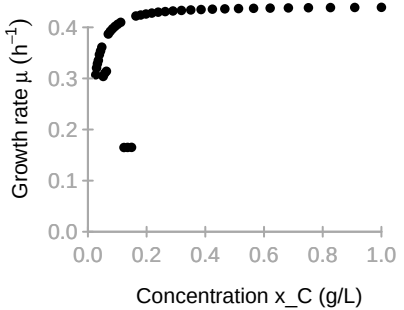
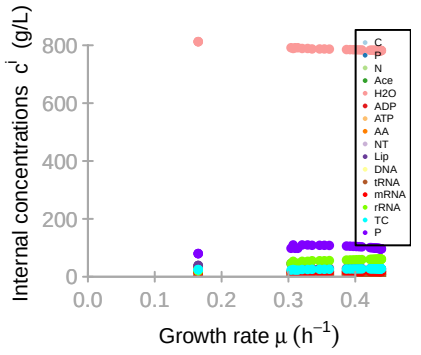
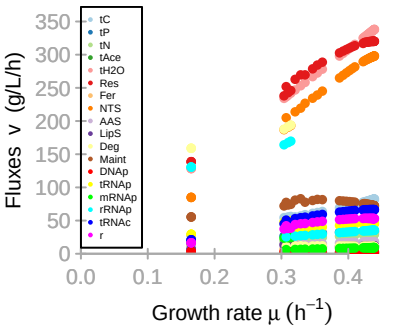
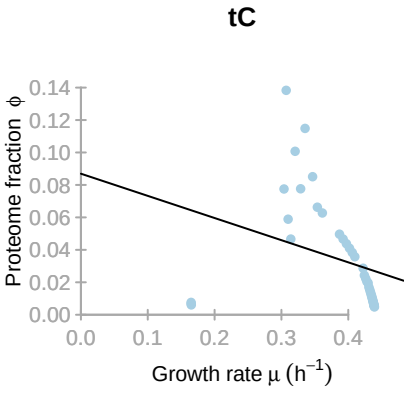
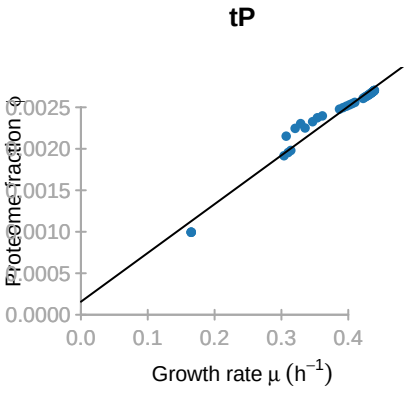
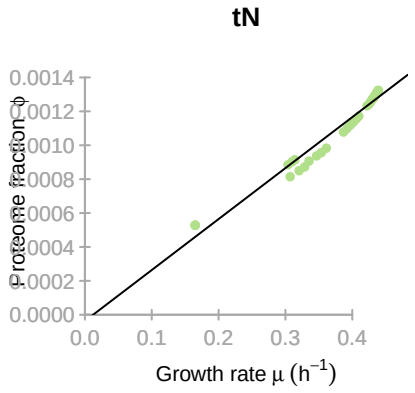

Growth rate μ (h−1)
0.0
0.1
0.2
0.3
0.4
0.0
0.2
0.4
0.6
0.8
1.0
Concentration x_C (g/L)

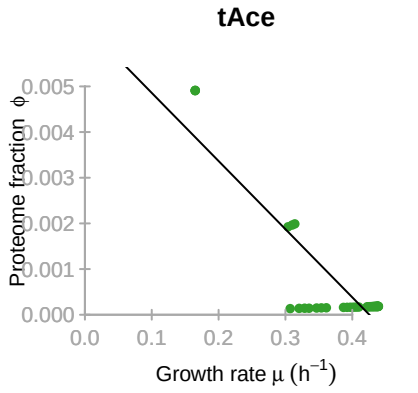

Internal concentrations ci (g/L)
0
200
400
600
800
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)
C
P
N
Ace
H2O
ADP
ATP
AA
NT
Lip
DNA
tRNA
mRNA
rRNA
TC
P

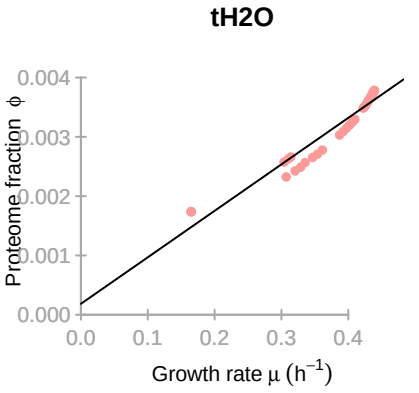

Fluxes v (g/L/h)
0
50
100
150
200
250
300
350
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)
tC
tP
tN
tAce
tH2O
Res
Fer
NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
r

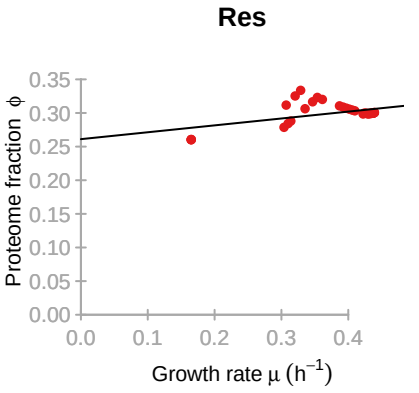

tC
Proteome fraction ϕ
0.00
0.02
0.04
0.06
0.08
0.10
0.12
0.14
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

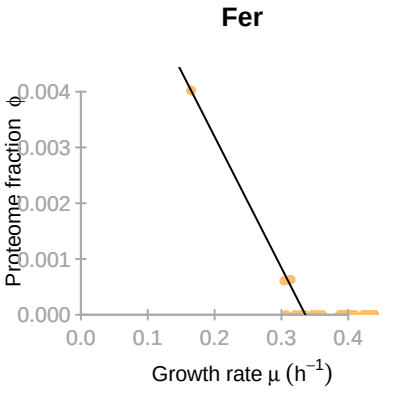

tP
Proteome fraction ϕ
0.0000
0.0005
0.0010
0.0015
0.0020
0.0025
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

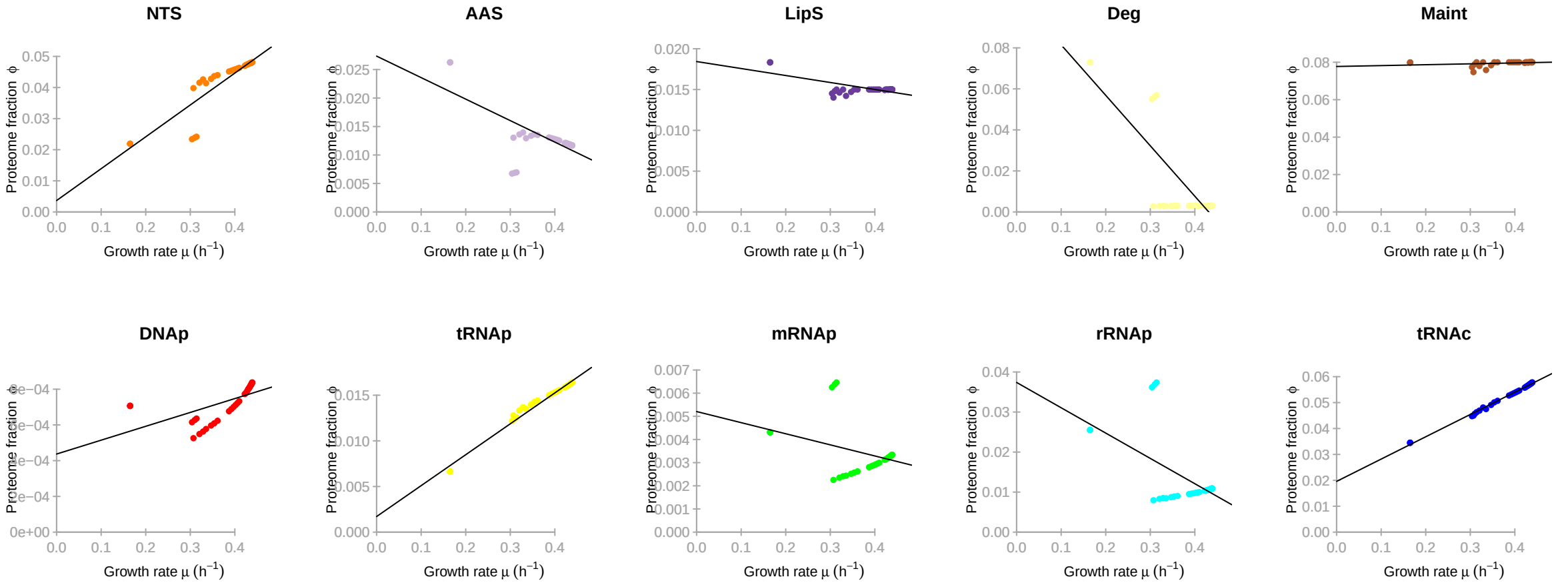

tN
Proteome fraction ϕ
0.0000
0.0002
0.0004
0.0006
0.0008
0.0010
0.0012
0.0014
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

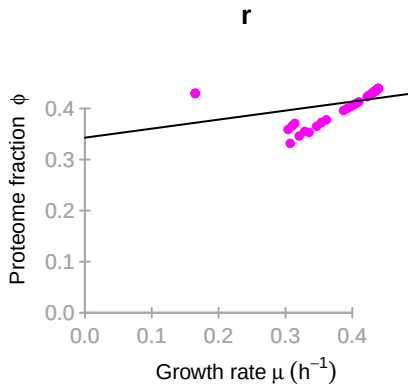

tAce
Proteome fraction ϕ
0.000
0.001
0.002
0.003
0.004
0.005
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

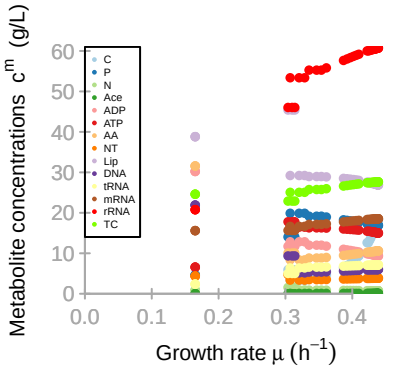

tH2O
Proteome fraction ϕ
0.000
0.001
0.002
0.003
0.004
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

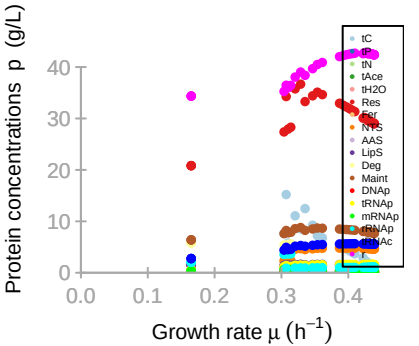

Res
Proteome fraction ϕ
0.00
0.05
0.10
0.15
0.20
0.25
0.30
0.35
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

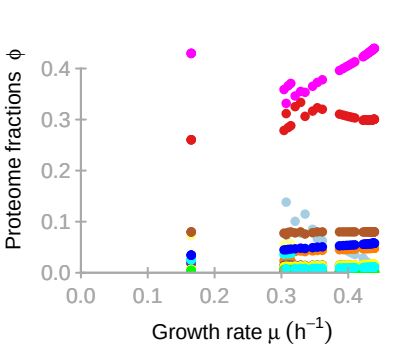

Fer
Proteome fraction ϕ
0.000
0.001
0.002
0.003
0.004
0.0
0.1
0.2
0.3
0.4
Growth rate μ (h−1)

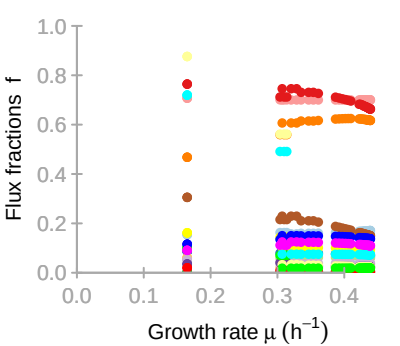

NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
Proteome fraction ϕ
Growth rate μ (h−1)

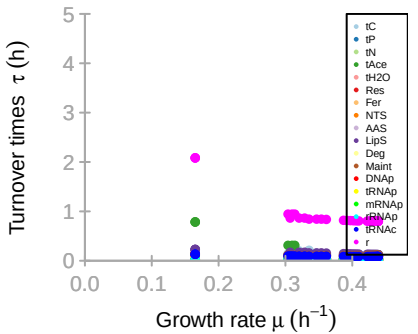

r
Proteome fraction ϕ
Growth rate μ (h−1)

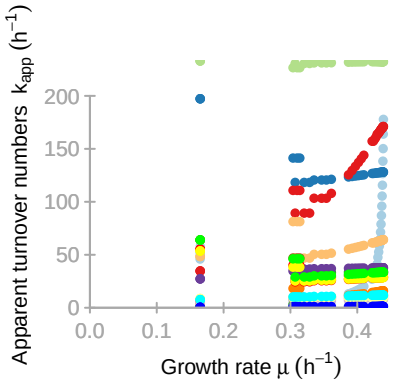

Metabolite concentrations cm (g/L)
C
P
N
Ace
ADP
ATP
AA
NT
Lip
DNA
tRNA
mRNA
rRNA
TC
Growth rate μ (h−1)

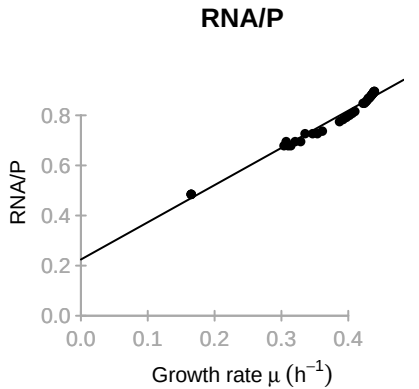

Protein concentrations p (g/L)
tC
tP
tN
tAce
tH2O
Res
Fer
NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
Growth rate μ (h−1)

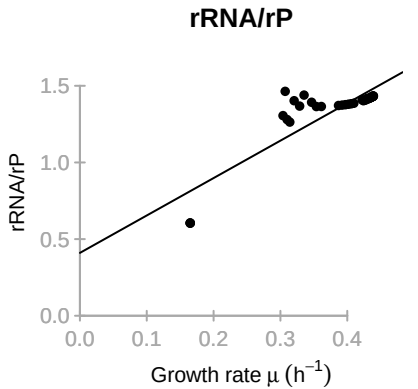

Proteome fractions ϕ
Growth rate μ (h−1)

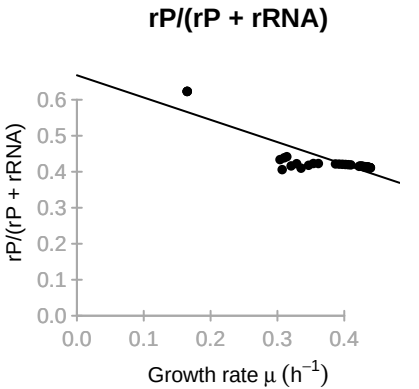

Flux fractions f
Growth rate μ (h−1)


Turnover times τ (h)
tC
tP
tN
tAce
tH2O
Res
Fer
NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
r
Growth rate μ (h−1)

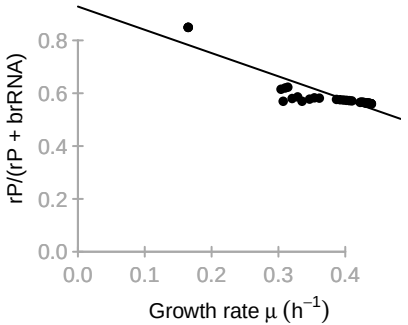

Apparent turnover numbers kapp (h−1)
Growth rate μ (h−1)

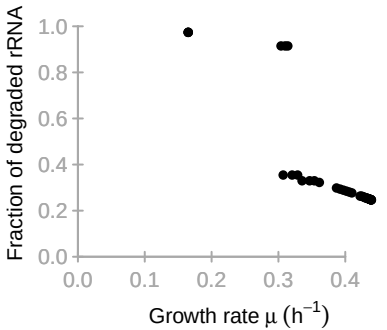

RNA/P
RNA/P
Growth rate μ (h−1)

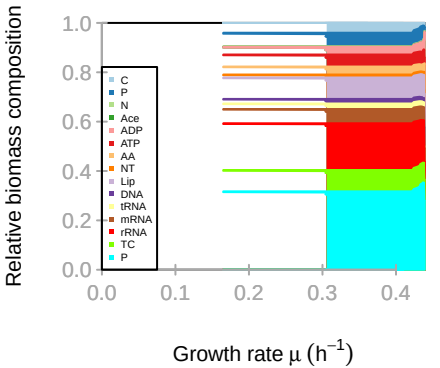

rRNA/rP
rRNA/rP
Growth rate μ (h−1)

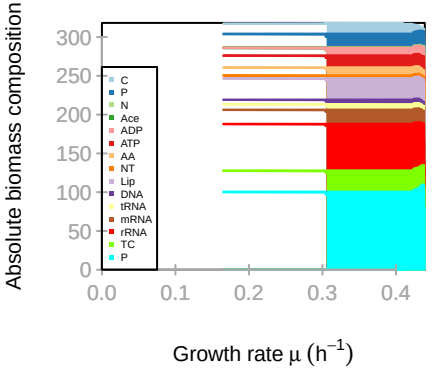

rP/(rP + rRNA)
rP/(rP + rRNA)
Growth rate μ (h−1)

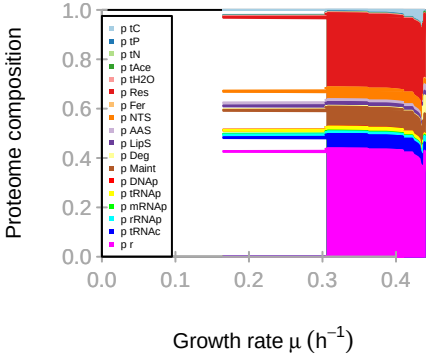
Protein mass fraction in ribosome

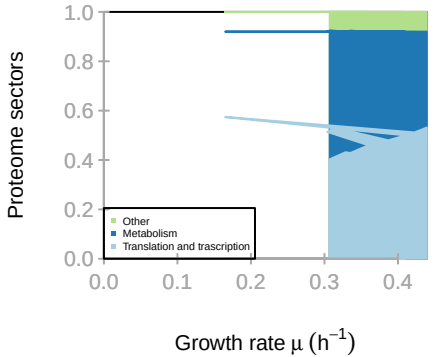












M

	tC	tP	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	Maint	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
C	1	0	0	0	0	−0.002	−0.02	−0.17	−0.76	−0.8	0	0	0	0	0	0	0	0
P	0	1	0	0	0	−0.124	−0.12	0.05	0	−0.1	0	0	0	0	0	0	0	0
N	0	0	1	0	0	0	0	−0.08	−0.24	−0.1	0	0	0	0	0	0	0	0
Ace	0	0	0	−1	0	0.002	0.02	0	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	1	0.072	0.07	−0.06	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	−0.874	0.91	0.67	0	0	0	1	0	0	0	0	0.1	0.1
ATP	0	0	0	0	0	0.926	−0.86	−0.69	0	0	0	−1	0	0	0	0	−0.1	−0.1
AA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	−0.2	0
NT	0	0	0	0	0	0	0	0.28	0	0	1	0	−1	−1	−1	−1	0	0
Lip	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	−0.1	0	0	1	0	0	−0.7	0.1
mRNA	0	0	0	0	0	0	0	0	0	0	−0.1	0	0	0	1	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	−0.8	0	0	0	0	1	0	0
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	−0.9
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8

K

	tC	tP	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	Maint	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
x_C	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_P	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_N	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_Ace	0	0	0	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_H2O	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
C	10	0	0	0	0	3	3	3	3	3	0	0	0	0	0	0	0	0
P	0	10	0	0	0	3	3	10	0	2	0	0	0	0	0	0	0	0
N	0	0	10	0	0	0	0	2	2	2	0	0	0	0	0	0	0	0
Ace	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	10	0	0	10	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	3	3	10	0	0	0	0	0	0	0	0	0	0
ATP	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	4	5
AA	0	0	0	0	0	0	0	0	10	0	0	0	0	0	0	0	10	0
NT	0	0	0	0	0	0	0	10	0	0	0	0	5	3	1	2	0	0
Lip	0	0	0	0	0	0	0	0	0	30	0	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	5	0
mRNA	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

KA

	tC	tP	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	Maint	DNAp	RNAp	mRNAp	rRNAp	tRNAc	r
x_C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_Ace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_H2O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
ATP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NT	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lip	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
DNA	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
mRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
rRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

kcat

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
kcatf	800	500	500	500	1000	20	250	300	80	40	50	10	200	136	96	136	50	4.55
kcatb	50	6	6	6	1	2	2	3	8	4	0	0	0	0	0	0	0	0

Keq

[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]
160	833.333333333333	833.333333333333	833.333333333333	10000	0.37037037037037	41.6666666666667	1666.66666666667	16.6666666666667	25	Inf	Inf	Inf	Inf	Inf	Inf	Inf

minimal phi constraint

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	0	0	0	0	0	0	0	0	0	0.015	0.003	0.08	0	0	0	0	0	0

minimal f constraint

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0