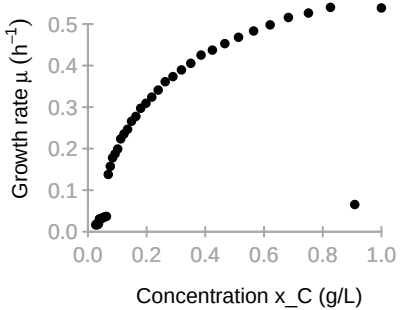
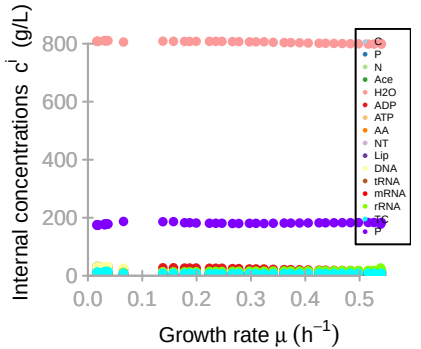
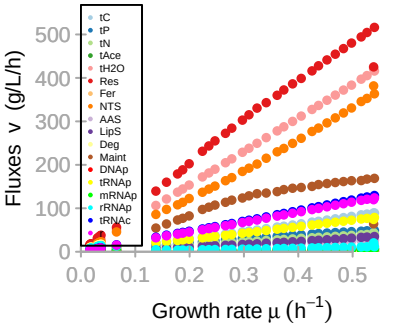
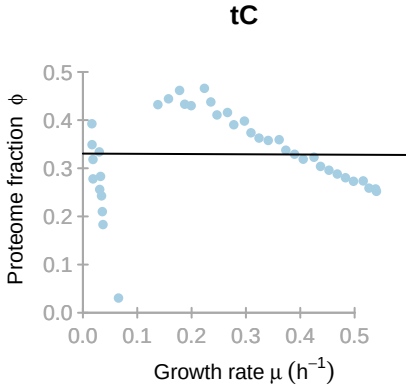
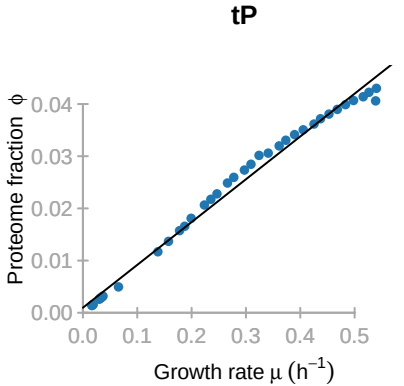
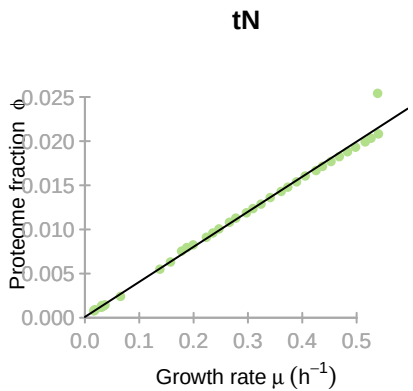

Growth rate μ (h−1)
Concentration x_C (g/L)

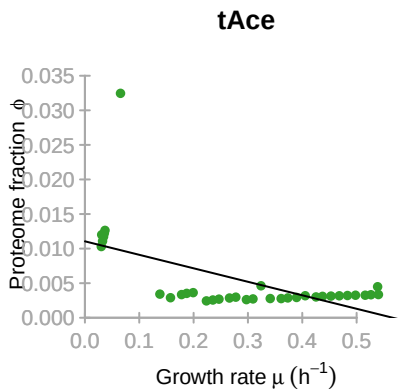

Internal concentrations ci (g/L)
Growth rate μ (h−1)
C
P
N
Ace
H2O
ADP
ATP
AA
NT
Lip
DNA
tRNA
mRNA
rRNA
tC
tP

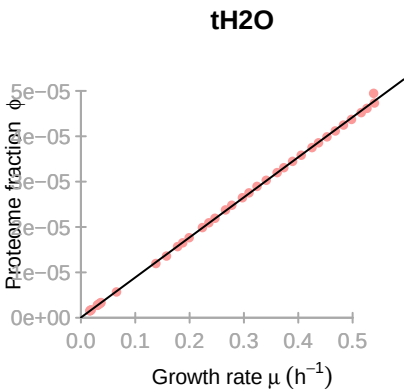

Fluxes v (g/L/h)
Growth rate μ (h−1)
tC
tP
tN
tAce
tH2O
Res
Fer
NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc

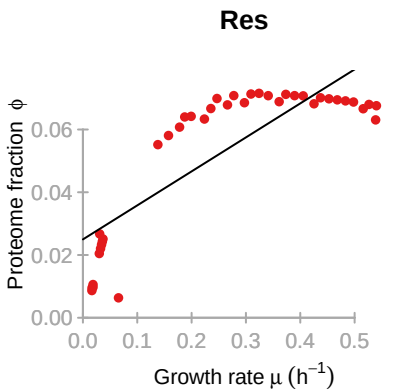

tC
Proteome fraction ϕ
Growth rate μ (h−1)

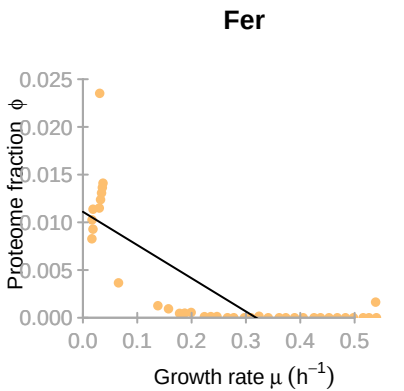

tP
Proteome fraction ϕ
Growth rate μ (h−1)

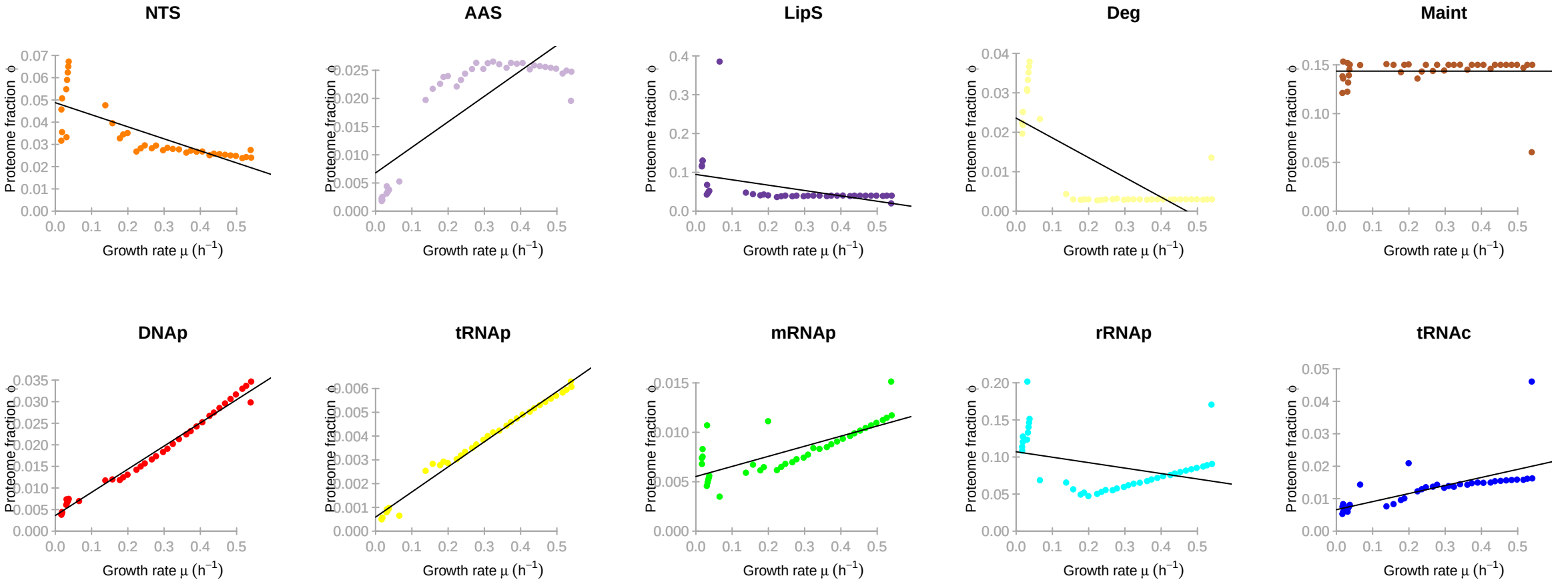

tN
Proteome fraction ϕ
Growth rate μ (h−1)

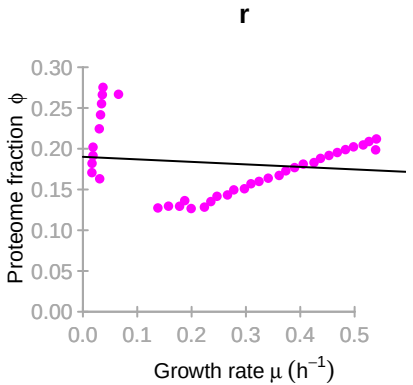

tAce
Proteome fraction ϕ
Growth rate μ (h−1)

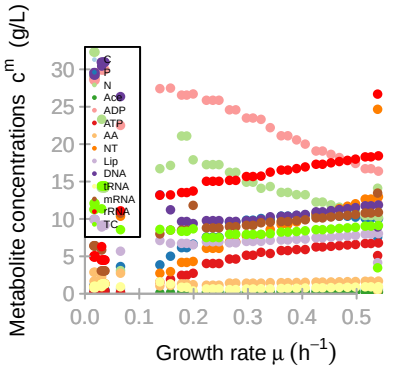

tH2O
Proteome fraction ϕ
Growth rate μ (h−1)

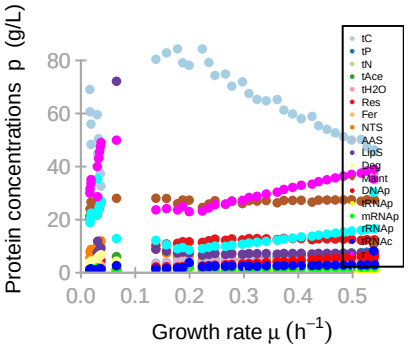

Res
Proteome fraction ϕ
Growth rate μ (h−1)

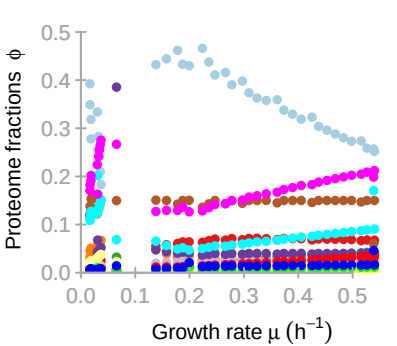

Fer
Proteome fraction ϕ
Growth rate μ (h−1)

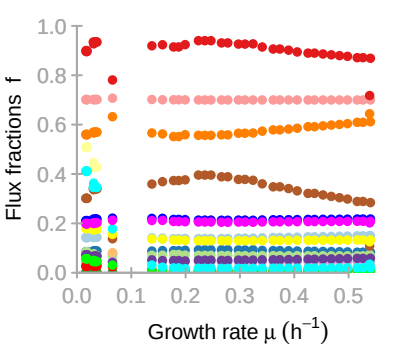

NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
Proteome fraction ϕ
Growth rate μ (h−1)

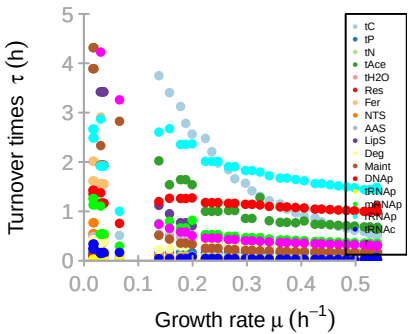

r
Proteome fraction ϕ
Growth rate μ (h−1)

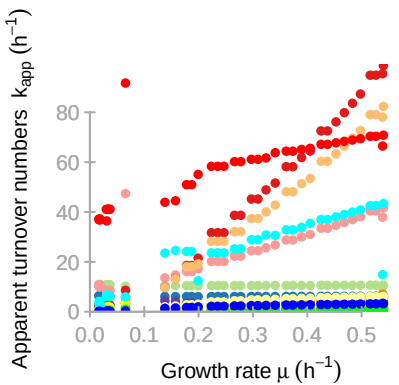

Metabolite concentrations cm (g/L)
C
P
N
Ac
ADP
ATP
AA
NT
Lip
DNA
tRNA
mRNA
rRNA
TC
Growth rate μ (h−1)

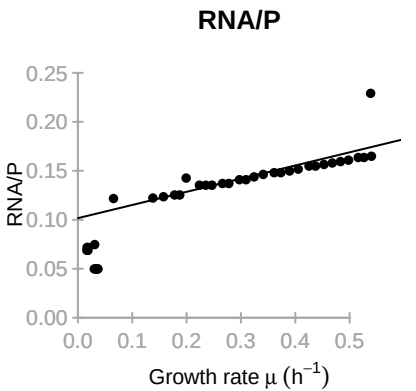

Protein concentrations p (g/L)
tC
tP
tN
tAce
tH2O
Res
Fer
NTS
AAS
LipS
Deg
Maint
DNAp
tRNAp
mRNAp
rRNAp
tRNAc
Growth rate μ (h−1)

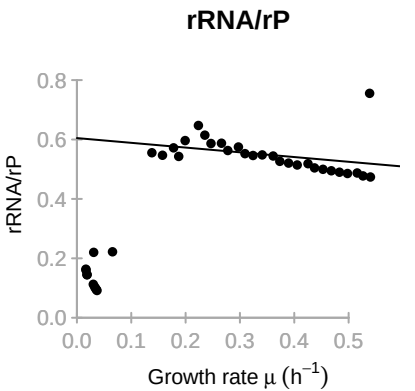

Proteome fractions ϕ
Growth rate μ (h−1)

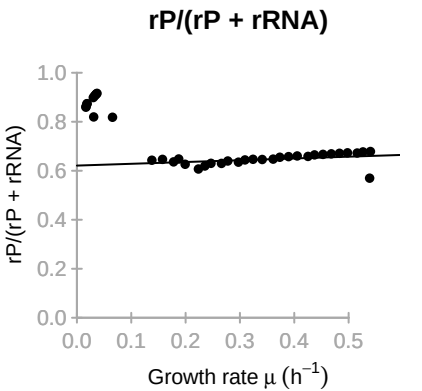

Flux fractions f
Growth rate μ (h−1)


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

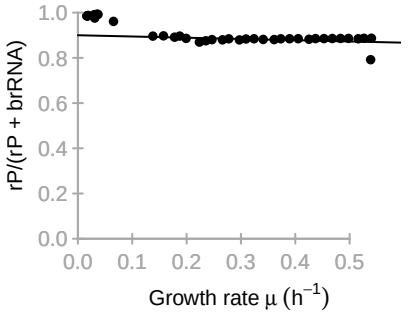

Apparent turnover numbers kapp (h−1)
Growth rate μ (h−1)

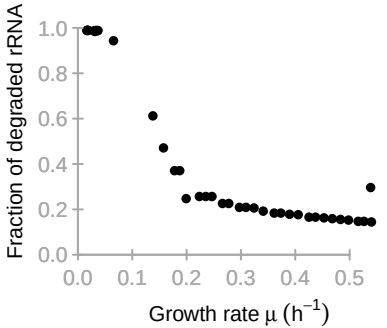

RNA/P
RNA/P
Growth rate μ (h−1)

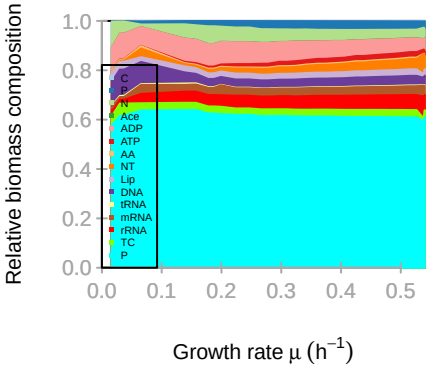

rRNA/rP
rRNA/rP
Growth rate μ (h−1)

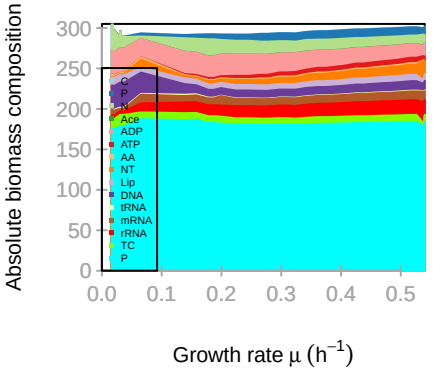

rP/(rP + rRNA)
rP/(rP + rRNA)
Growth rate μ (h−1)

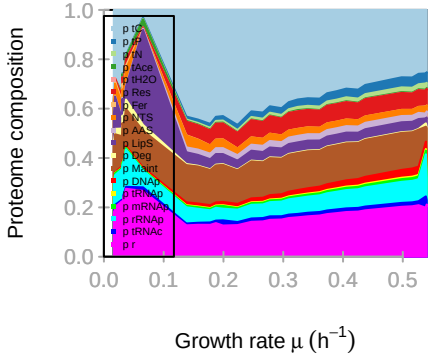
Protein mass fraction in ribosome

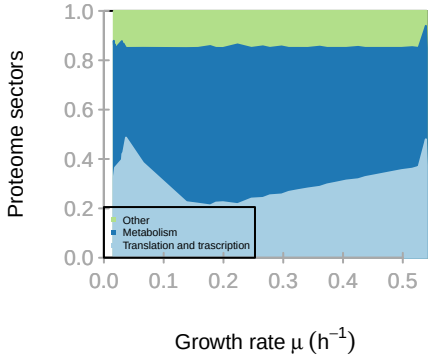












M

	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	−0.175	−0.76	−0.112	0	0	0	0	0	0	0	0
P	0	1	0	0	0	−0.124	−0.12	0.046	0	0.102	0	0	0	0	0	0	0	0
N	0	0	1	0	0	0	0	−0.079	−0.24	−0.004	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	−0.054	0	−0.064	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	−0.874	0.91	0.657	0	0.774	0	1	0	0	0	0	0.1	0.1
ATP	0	0	0	0	0	0.926	−0.86	−0.692	0	−0.82	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	0.297	0	0	1	0	−1	−1	−1	−1	0	0
Lip	0	0	0	0	0	0	0	0	0	0.124	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	1	0	0	0	0	0.9	1	1	1	1	0	0	0	0	0	0	0	0
P	0	0	0	0	0	0.9	1	0	0	0	0	0	0	0	0	0	0	0
N	0	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0	0
Ace	0	0	0	1	0	0.9	1	0	0	0	0	0	0	0	0	0	0	0
H2O	0	0	0	0	0	810	900	900	0	900	0	0	0	0	0	0	0	0
ADP	0	0	0	0	0	4.5	5	5	0	0	0	5	0	0	0	0	0	5
ATP	0	0	0	0	0	0.9	1	1	0	1	0	1	0	0	0	0	1	1
AA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0
NT	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	0	0
Lip	0	0	0	0	0	0	0	0	0	2	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	1	0	0	1	0
mRNA	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	3	0	0	0	0	3	0	0
TC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1
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

	tC	tP	tN	tAce	tH2O	Res	Fer	NTS	AAS	LipS	Deg	Maint	DNAp	tRNAp	mRNAp	rRNAp	tRNAc	r
kcatf	7	16	27	10	47926	182	364	842	20	36	10	10	2	150	10	2	200	20
kcatb	1	2	3	1	4793	18	36	84	2	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]	[,18]
[1,]	7	8	9	100	9.99916544961402	1820	45500	0.0556878306878307	10	0.02	Inf	Inf	Inf	Inf	Inf	Inf	Inf	Inf

phi input

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]
[1,]	0.0989	0.01	0.01	0.001	1e−04	0.1	0.15	0.05	0.05	0.02	0.01	0.15	0.01	0.01	0.01	0.02	0.05	0.25

average saturation input

1

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	0.04	0.003	0.15	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