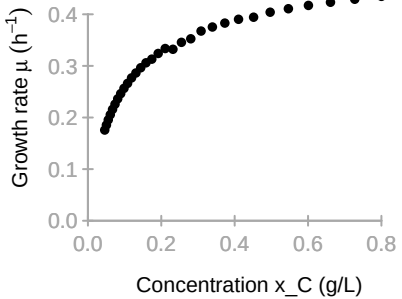
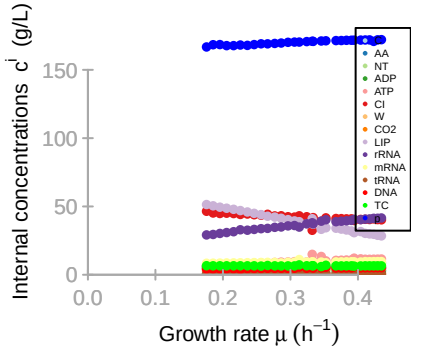
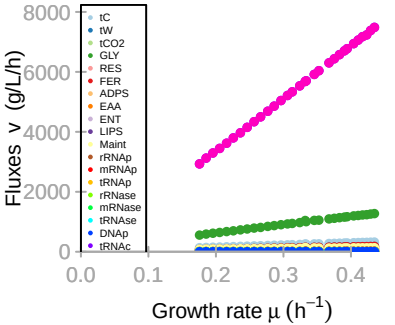
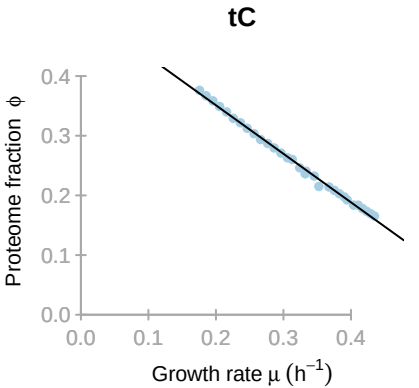
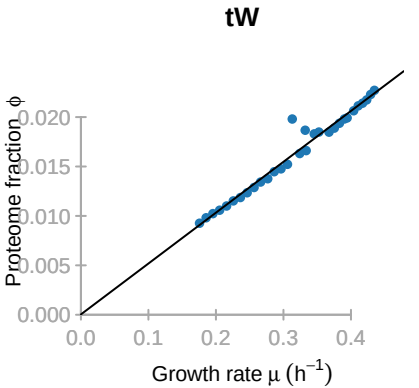
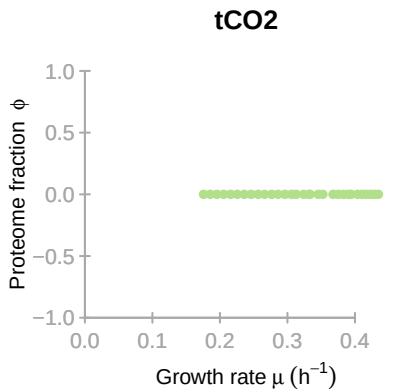

Growth rate μ (h^{-1})
Concentration x_C (g/L)

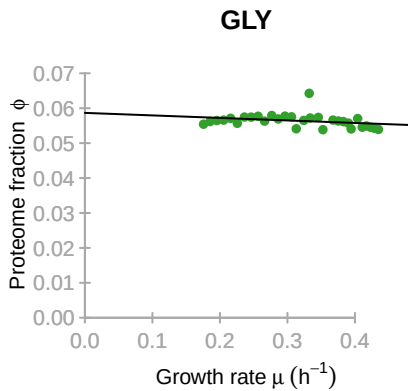

Internal concentrations c^i (g/L)
Growth rate μ (h^{-1})
AA
NT
ADP
ATP
Cl
W
CO2
LIP
rRNA
mRNA
tRNA
DNA
TC
LD

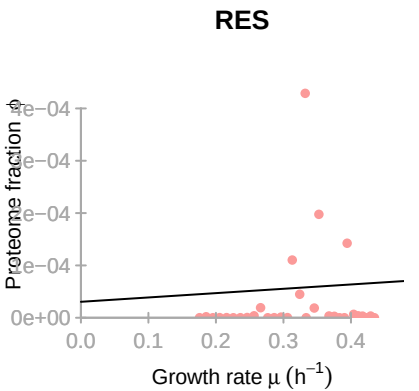

Fluxes v (g/L/h)
Growth rate μ (h^{-1})
tC
tW
tCO2
GLY
RES
FER
ADPS
EAA
ENT
LIPS
Maint
rRNAp
mRNAp
tRNAp
rRNase
mRNase
tRNAse
DNAp
tRNAc

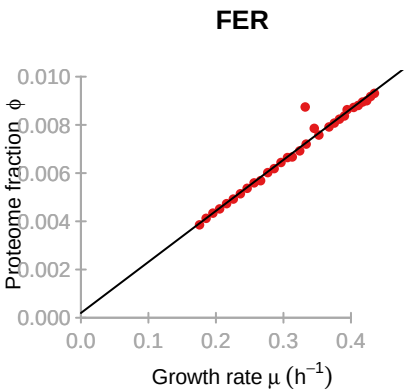

tC
Proteome fraction ϕ
Growth rate μ (h^{-1})

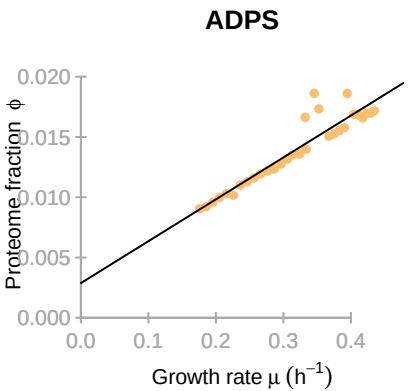

tW
Proteome fraction ϕ
Growth rate μ (h^{-1})

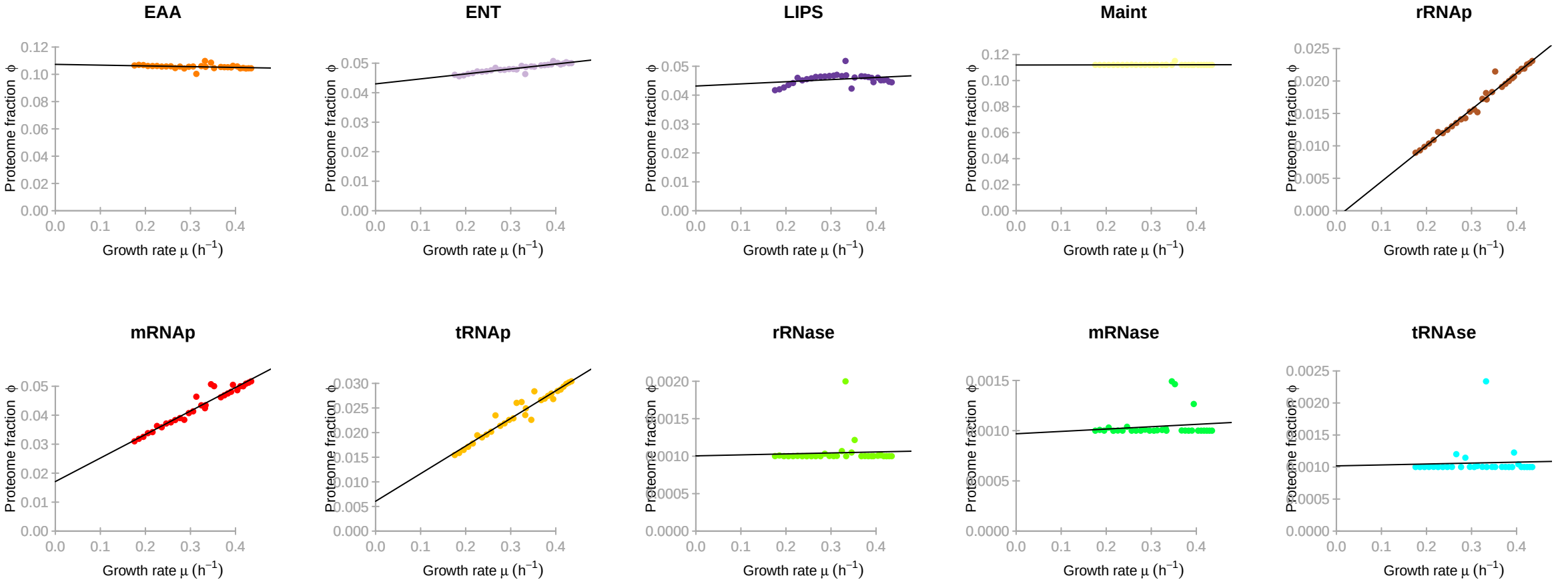

tCO2
Proteome fraction ϕ
Growth rate μ (h^{-1})

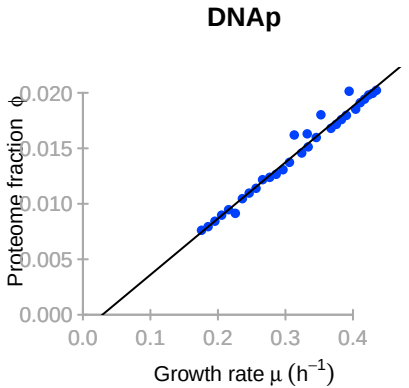

GLY
Proteome fraction ϕ
Growth rate μ (h^{-1})

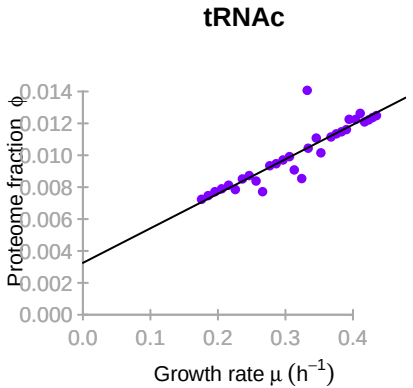

RES
Proteome fraction ϕ
Growth rate μ (h^{-1})

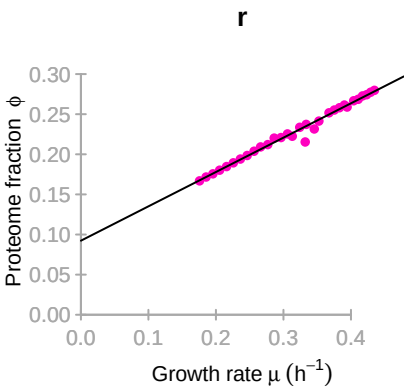

FER
Proteome fraction ϕ
Growth rate μ (h^{-1})

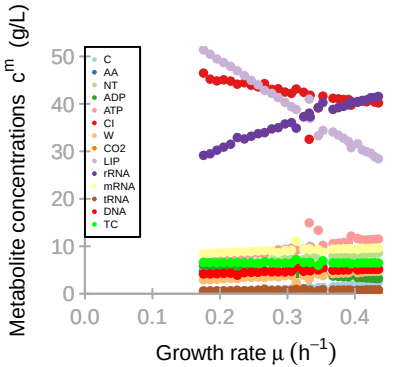

ADPS
Proteome fraction ϕ
Growth rate μ (h^{-1})

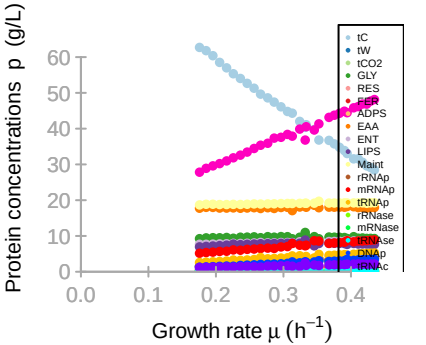

EAA
ENT
LIPS
Maint
rRNAp
mRNAp
tRNAp
rRNase
mRNase
tRNAse
Proteome fraction ϕ
Growth rate μ (h−1)

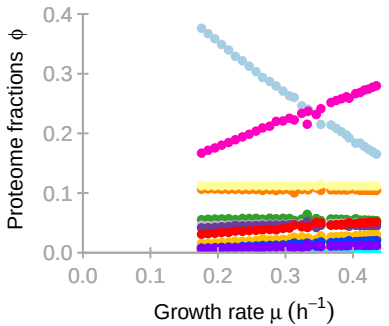

DNAp
Proteome fraction ϕ
Growth rate μ (h−1)

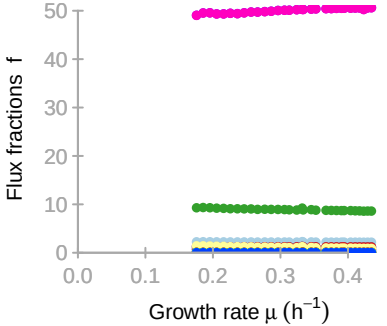

tRNAc
Proteome fraction ϕ
Growth rate μ (h−1)

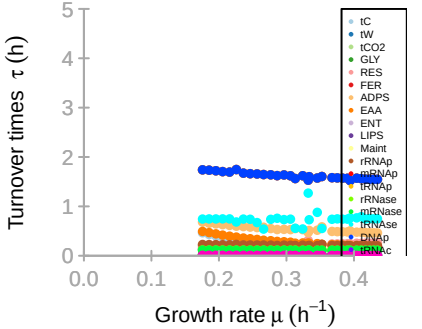

r
Proteome fraction ϕ
Growth rate μ (h−1)

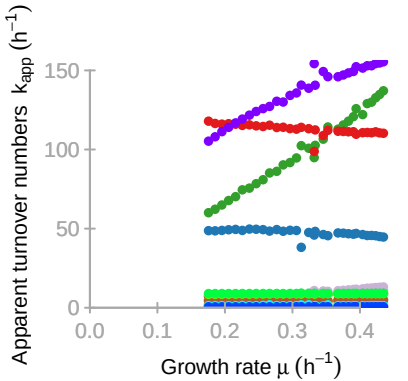

Metabolite concentrations cm (g/L)
C
AA
NT
ADP
ATP
CI
W
CO2
LIP
rRNA
mRNA
tRNA
DNA
TC
Growth rate μ (h−1)

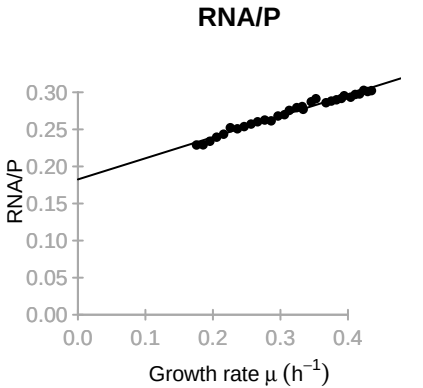

Protein concentrations p (g/L)
tC
tW
tCO2
GLY
RES
FER
ADPS
EAA
ENT
LIPS
Maint
rRNAp
mRNAp
tRNAp
rRNase
mRNase
tRNAse
DNAp
tRNAc
Growth rate μ (h−1)

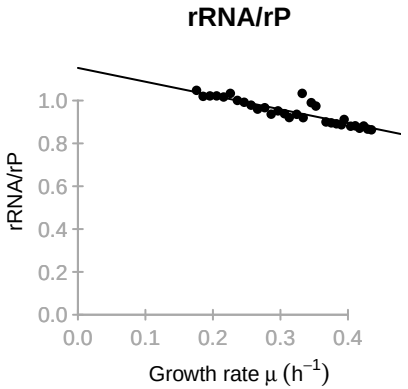

Proteome fractions ϕ
Growth rate μ (h−1)

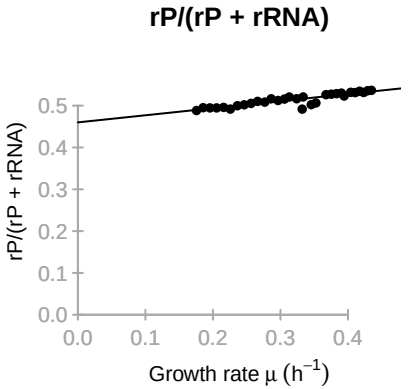

Flux fractions f
Growth rate μ (h−1)

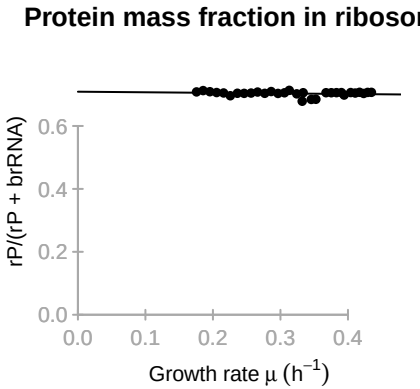

Turnover times τ (h)
tC
tW
tCO2
GLY
RES
FER
ADPS
EAA
ENT
LIPS
Maint
rRNAp
mRNAp
tRNAp
rRNase
mRNase
tRNAse
DNAp
tRNAc
Growth rate μ (h−1)

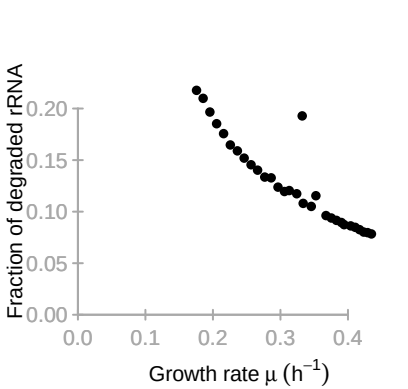

Apparent turnover numbers kapp (h−1)
Growth rate μ (h−1)

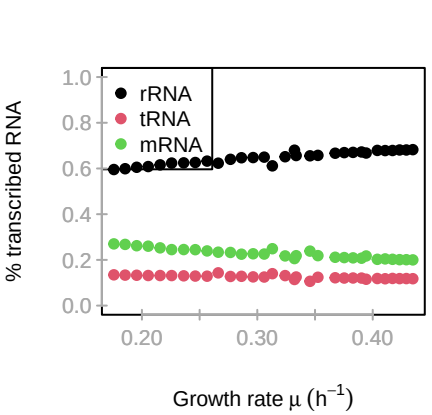

RNA/P
RNA/P
Growth rate μ (h−1)

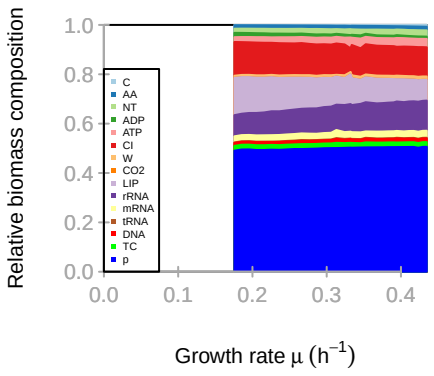

rRNA/rP
rRNA/rP
Growth rate μ (h−1)

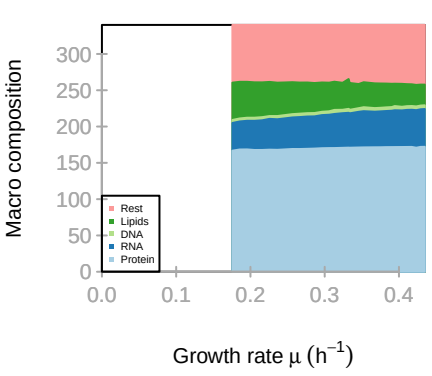

rP/(rP + rRNA)
rP/(rP + rRNA)
Growth rate μ (h−1)

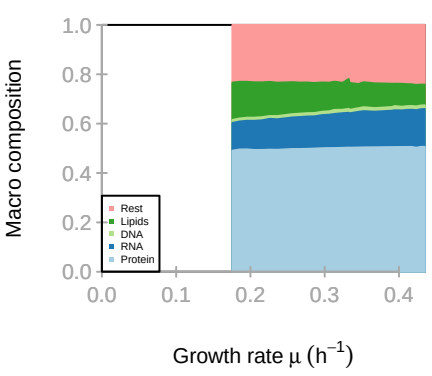

Protein mass fraction in ribosome
rP/(rP + brRNA)
Growth rate μ (h−1)

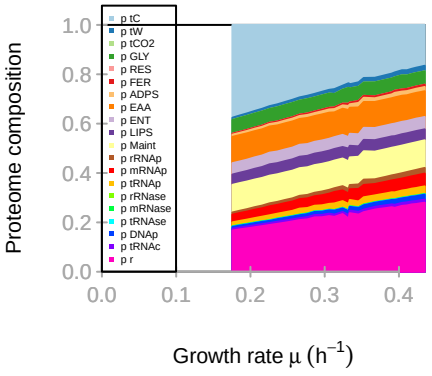

Fraction of degraded rRNA
Growth rate μ (h−1)

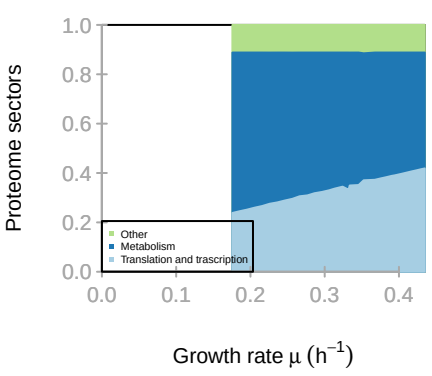

rRNA
tRNA
mRNA
% transcribed RNA
Growth rate μ (h−1)

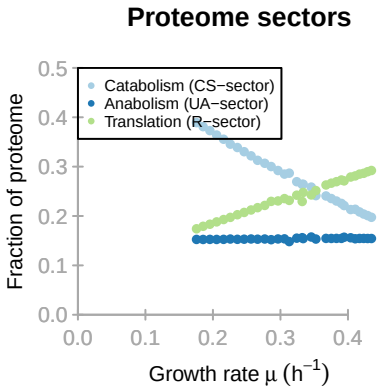

Relative biomass composition
C
AA
NT
ADP
ATP
CI
W
CO2
LIP
rRNA
mRNA
tRNA
DNA
TC
p
Growth rate μ (h−1)


Macro composition
Rest
Lipids
DNA
RNA
Protein
Growth rate μ (h−1)


Macro composition
Rest
Lipids
DNA
RNA
Protein
Growth rate μ (h−1)


Proteome composition
p tC
p tW
p tCO2
p GLY
p RES
p FER
p ADPS
p EAA
p ENT
p LIPS
p Maint
p rRNAp
p mRNAp
p tRNAp
p rRNAse
p mRNAse
p tRNAse
p DNAp
p tRNAc
p r
Growth rate μ (h−1)


Proteome sectors
Other
Metabolism
Translation and trascription
Growth rate μ (h−1)


Proteome sectors
Catabolism (CS−sector)
Anabolism (UA−sector)
Translation (R−sector)
Fraction of proteome
0.0
0.1
0.2
0.3
0.4
0.5
Growth rate μ (h−1)

M

	tC	tW	tCO2	GLY	RES	FER	ADPS	EAA	ENT	LIPS	Maint	rRNAp	mRNAp	tRNAp	rRNase	mRNase	tRNAse	DNAp	tRNAc	r
C	1	0	0	−0.2	0	0	0	−0.5	−0.167	0	0	0	0	0	0	0	0	0	0	0
AA	0	0	0	0	0	0	0	1	−0.167	0	0	0	0	0	0	0	0	0	−0.01	0
NT	0	0	0	0	0	0	−1	0	0.334	0	0	−1	−1	−1	1	1	1	−1	0	0
ADP	0	0	0	−0.8	−0.98	0	1	0	0.666	0.82	1	0	0	0	0	0	0	0	0.05	0.05
ATP	0	0	0	0.8	0.98	0	0	0	−0.666	−0.82	−1	0	0	0	0	0	0	0	−0.05	−0.05
Cl	0	0	0	0.2	−0.02	−1	0	−0.5	0	−0.18	0	0	0	0	0	0	0	0	0	0
W	0	−1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	−1	0	0.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIP	0	0	0	0	0	0	0	0	0	0.18	0	0	0	0	0	0	0	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	0	1	0	0	−1	0	0	0	0	0
mRNA	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	−1	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	−1	0	−0.94	0.94
DNA	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	0.95	−0.95
p	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.01

K

	tC	tW	tCO2	GLY	RES	FER	ADPS	EAA	ENT	LIPS	Maint	rRNAp	mRNAp	tRNAp	rRNase	mRNase	tRNAse	DNAp	tRNAc	r
x_C	0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
C	2	0	0	1	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0
AA	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	1	0
NT	0	0	0	0	0	0	1	0	0	0	0	1	1	1	0	0	2	1	0	0
ADP	0	0	0	1	1	0	2	0	0	2	2	0	0	0	0	0	0	0	0	2
ATP	0	0	0	4	4	0	0	0	2	2	2	0	0	0	0	0	0	0	2	2
CI	0	0	0	82	28	28	0	28	0	28	0	0	0	0	0	0	0	0	0	0
W	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	1	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	0	14	0	0	5	0	0	0	0	0
mRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0
tRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0
DNA	0	0	0	0	0	0	0	0	0	0	0	0	0	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	0	1	1
p	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

KA

	tC	tW	tCO2	GLY	RES	FER	ADPS	EAA	ENT	LIPS	Maint	rRNAp	mRNAp	tRNAp	rRNase	mRNase	tRNAse	DNAp	tRNAc	r
x_C	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
x_CO2	0	0	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	0	0
AA	0	0	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	0	0
ADP	0	0	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	0	0
CI	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CO2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LIP	35	35	35	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
rRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	45
mRNA	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
tRNA	0	0	0	0	0	0	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	2	2	2	0	0	0	2	0	0
TC	0	0	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	0	0

kcat

	tC	tW	tCO2	GLY	RES	FER	ADPS	EAA	ENT	LIPS	Maint	rRNAp	mRNAp	tRNAp	rRNase	mRNase	tRNAse	DNAp	tRNAc	r
kcatf	66	148	10	342	11	201	3	13	26	20	10	10	1	1	10	10	10	1	11852	593
kcatb	7	15	1	34	1	20	1	1	3	2	0	0	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]	[,
37.7142857142857	4.93333333333333	10	3299.29411764706	3.14285714285714	0.358928571428571	6	0.464285714285714	4.33333333333333	0.357142857142857	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]	[,19]	[,20]
[1,]	0.05	0.01	0.01	0.07	0.07	0.01	0.01	0.15	0.035	0.1	0.112	0.01	0.01	0.01	0.001	0.001	0.001	0.02	0.02	0.3

average saturation input

3

minimal phi constraint

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]	[,19]	[,20]
[1,]	0	0	0	0	0	0	0	0	0	0	0.112	0	0	0	0.001	0.001	0.001	0	0	0

minimal f constraint

	[,1]	[,2]	[,3]	[,4]	[,5]	[,6]	[,7]	[,8]	[,9]	[,10]	[,11]	[,12]	[,13]	[,14]	[,15]	[,16]	[,17]	[,18]	[,19]	[,20]
[1,]	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0