

## **8. BIBLIOGRAFIA**

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## BIBLIOGRAFIA

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## **9. ANNEXES**

## **ANNEX 1**

## NOMENCLATURA

ADP	Difosfat d'adenosina
Ac/HAc	Acetat, àcid acètic
AcCoA	Acetil-CoenzimA
ACK	Acetat-carboxiquinasa
aediAPim	Àcid diaminopimèlic
AICAR	Aminoimidazol carboxamida ribonucleòtid
$\alpha$ KG	$\alpha$ -cetoglutarat
aKiVal	$\alpha$ -ceto-isovaleric àcid
AspSal	Aspartic $\beta$ -semialdehid
Ala	Alanina
AMP	Monofosfat d'adenosina
Arg	Arginina
Asn	Asparragina
Asp	Àcid aspartic
ATP	Trifosfat d'adenosina
CarbP	Carbamil fosfat
CAT	Cicle dels àcids tricarboxílics
CTE	Cadena de transport d'electrons
CS	Citrat-sintasa
VPF	Via de les pentoses fosfat
Chor	Corismat, àcid corísmic
CO <sub>2</sub>	Diòxid de carboni
CoA	Coenzim A
Cis	Cisteïna
DHAP	Dihidroxiacetona fosfat
DNA	àcid desoxiribonucleic
FAD <sup>+</sup>	Flavina adenina dinucleòtid (oxidat)
FADH+H <sup>+</sup>	Flavina adenina dinucleòtid (reduït)
FH4	Tetrahidrofolat

F6P	Fructosa-6-fosfat
Fum	Fumarat, àcid fumaric
G3P	Gliceraldehid-3-fosfat
GDP	Difosfat de guanina
Glc	Glucosa
G6P/Glc6P	Glucosa 6 fosfat
Gln	Glutamina
Glu	Glutamat, àcid glutàmic
Gly	Glicina
GTP	Trifosfat de guanina
H <sub>2</sub> O	Aigua
His	Histidina
HoSer	Homoserina
H <sub>3</sub> PO <sub>4</sub>	Àcid fosfòric
Ile	Isoleucina
α-KG	α-cetoglutarat
Lac	Lactat, àcid làctic
Leu	Leucina
Lys	Lisina
Mal	Malat, àcid màlic
Met	Metionina
N10FormilFH4	N10 Formil-tetrahidrofolat
N5N10Metenil FH4	N5N10 Metenil-tetrahidrofolat
N5N10MetileFH4	N5N10 Metilè-tetrahidrofolat
N5N10MetilFH4	N5N10 Metil-tetrahidrofolat
NAD <sup>+</sup>	Nicotinamida adenina dinucleòtid (oxidat)
NADH+H <sup>+</sup>	Nicotinamida adenina dinucleòtid (reduït)
NADP <sup>+</sup>	Nicotinamida adenina dinucleòtid fosfat (oxidat)
NADPH+H <sup>+</sup>	Nicotinamida adenina dinucleòtid fosfat (reduït)
NH <sub>4</sub>	Amoni

NH <sub>3</sub>	Amoníac
O <sub>2</sub>	Oxigen
OAA/Oxal	Oxalacetat, àcid oxalacètic
PEP/PenolPir	Fosfoenolpiruvat
PEPC	Fosfoenolpiruvat.carboxilasa
Pepglicà	Peptidglicà
PilEtamina	Fosfatidiletanolamina
PilGliol	Fosfatidilglicerol
Phe	Fenilalanina
P <sub>i</sub>	Fosfat inorgànic, àcid fosfòric
PP <sub>i</sub>	Pirofosfat, àcid pirofosfòric
Pro	Prolina
PROT	Proteïna
Pir/Pyr	Piruvat
PirC	Piruvat-carboxilasa
Preph	Àcid prefèníc
PRPP	5-Fosforibosilpirofosfat
Psacch	Polisacàrids
PTA	Fosfotransacetilasa
PTS	Sistema de transport de la fosfotransferasa
R5P	Ribosa 5 fosfat
RNA	Ácid ribonucleic
Ser	Serina
SO <sub>3</sub> <sup>2-</sup>	Tiosulfat, àcid sulfurós
Suc	Succinat, àcid succínic
SucCoA	Succinil-CoA
Thr	Treonina
Trp	Triptòfan
Tyr	Tirosina
UMP	Fosfat d'uridina
Val	Valina



## **ANNEX 2**

<i>Escherichia coli</i>	K12 wt	K12 wt
Reacció Producte	mmols /g h	%
1,00 Preph	222,51	2,24%
2,00 Glu	40,12	0,40%
3,00 Phe	127,67	1,28%
4,00 Tyr	94,84	0,95%
5,00 Asp	2098,12	21,08%
6,00 Asn	164,15	1,65%
7,00 AspSAI	728,05	7,31%
8,00 HoSer	474,22	4,76%
9,00 Thr	368,43	3,70%
10,00 aediAPim	253,82	2,55%
11,00 Lys	233,46	2,35%
12,00 Met	105,78	1,06%
13,00 Ile	196,98	1,98%
14,00 Gln	1814,04	18,22%
15,00 Pro	149,56	1,50%
16,00 Arg	200,63	2,02%
17,00 PRPP	721,41	7,25%
18,00 His	65,66	0,66%
19,00 Ala	411,29	4,13%
20,00 aKiVal	594,60	5,97%
21,00 Val	288,18	2,90%
22,00 Leu	306,42	3,08%
23,00 Ser	1287,02	12,93%
24,00 Gly	834,58	8,38%
25,00 Cys	167,80	1,69%
26,00 PTS	9954,27	100,00%
27,00 F6P	3396,33	34,12%
28,00 DHAP..	3618,24	36,35%
29,00 G3P	3493,66	35,10%
30,00 3PGli	15622,11	156,94%
31,00 PEP	14375,09	144,41%
32,00 PIR	11781,36	118,35%
33,00 PepGlicà	20,36	0,20%
34,00 PilEtamina	98,59	0,99%
35,00 PilGlicol	25,99	0,26%
36,00 CarbP	463,99	4,66%
37,00 Glu	6058,72	60,87%
38,00 AICAR	286,60	2,88%
39,00 DNA	87,04	0,87%
40,00 RNA	528,58	5,31%
41,00 R5P	5843,05	58,70%
42,00 Chor	262,64	2,64%
43,00 G3P	1707,21	17,15%
44,00 PROT	3647,85	36,65%
45,00 PSacch	189,58	1,90%
46,00 AcCoA	9876,26	99,22%
47,00 ALPHA-KG	3582,03	35,98%
48,00 SucCoA	2853,98	28,67%
49,00 Suc	2494,36	25,06%
50,00 Fum	2853,98	28,67%
51,00 Oxal	3632,39	36,49%
52,00 ATP(NADH)	37645,09	378,18%
53,00 ATP(FADH)	2853,98	28,67%
54,00 N5N10MFH4	770,19	7,74%
55,00 N10FFH4	417,92	4,20%
56,00 Acetat	3525,42	35,42%
57,00 CFùtils(ADP)	106447,40	1069,36%
58,00 Oxal (PEPC)	2047,76	20,57%
59,00 FH4	(-)62.81	

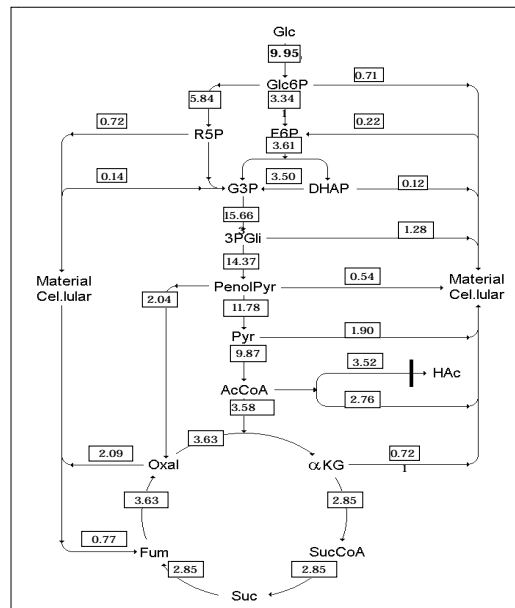


Diagrama de fluxos per la soca K12 wt en mmols/g h

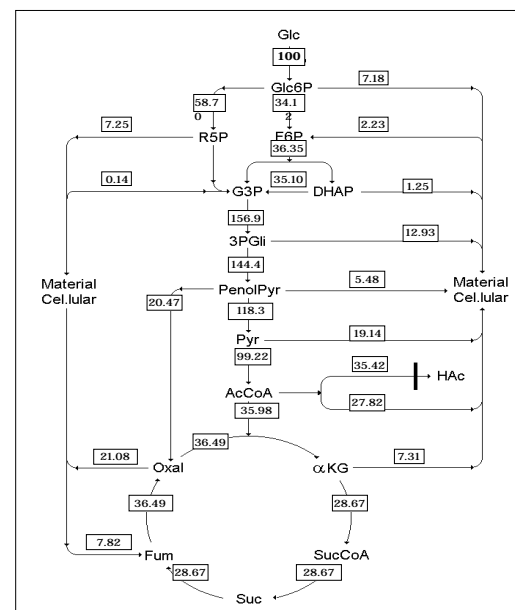


Diagrama de fluxos per la soca K12 wt en % respecte els mmols / g h d'entrada de glucosa

<i>Escherichia coli</i>		K12/pT3	K12/pT3
Reacció	Producte	mmols/g h	%
1,00	Preph	164,28	2,95%
2,00	Glu	29,62	0,53%
3,00	Phe	94,26	1,69%
4,00	Tyr	70,02	1,26%
5,00	Asp	1551,03	27,81%
6,00	Asn	121,19	2,17%
7,00	AspSAI	537,55	9,64%
8,00	HoSer	350,12	6,28%
9,00	Thr	272,01	4,88%
10,00	aediAPim	187,42	3,36%
11,00	Lys	172,36	3,09%
12,00	Met	78,10	1,40%
13,00	Ile	145,43	2,61%
14,00	Gln	1342,60	24,07%
15,00	Pro	110,42	1,98%
16,00	Arg	148,12	2,66%
17,00	PRPP	534,16	9,58%
18,00	His	48,47	0,87%
19,00	Ala	303,73	5,45%
20,00	aKiVal	439,00	7,87%
21,00	Val	212,76	3,81%
22,00	Leu	226,23	4,06%
23,00	Ser	951,37	17,06%
24,00	Gly	617,53	11,07%
25,00	Cys	123,88	2,22%
26,00	PTS	5577,93	100,00%
27,00	F6P	737,94	13,23%
28,00	DHAP..	901,74	16,17%
29,00	G3P	809,95	14,52%
30,00	3PGli	8018,51	143,75%
31,00	PEP	7067,14	126,70%
32,00	PIR	5151,77	92,36%
33,00	PepGlicà	15,05	0,27%
34,00	PilEtamina	72,59	1,30%
35,00	PilGlicol	19,19	0,34%
36,00	CarbP	343,21	6,15%
37,00	Glu	4476,45	80,25%
38,00	AICAR	212,49	3,81%
39,00	DNA	64,37	1,15%
40,00	RNA	391,69	7,02%
41,00	R5P	4311,99	77,30%
42,00	Chor	193,91	3,48%
43,00	G3P	1259,27	22,58%
44,00	PROT	2693,26	48,28%
45,00	PSacch	140,16	2,51%
46,00	AcCoA	3744,79	67,14%
47,00	ALPHA-KG	1180,46	21,16%
48,00	SucCoA	642,91	11,53%
49,00	Suc	377,38	6,77%
50,00	Fum	642,91	11,53%
51,00	Oxal	1218,91	21,85%
52,00	ATP(NADH)	16312,98	292,46%
53,00	ATP(FADH)	642,91	11,53%
54,00	N5N10MFH4	570,42	10,23%
55,00	N10FFH4	309,45	5,55%
56,00	Acetat	523,28	9,38%
57,00	CFútils(ADP)	36192,75	648,86%
58,00	Oxal (PEPC)	1512,58	27,12%
59,00	FH4	(-)46,83	

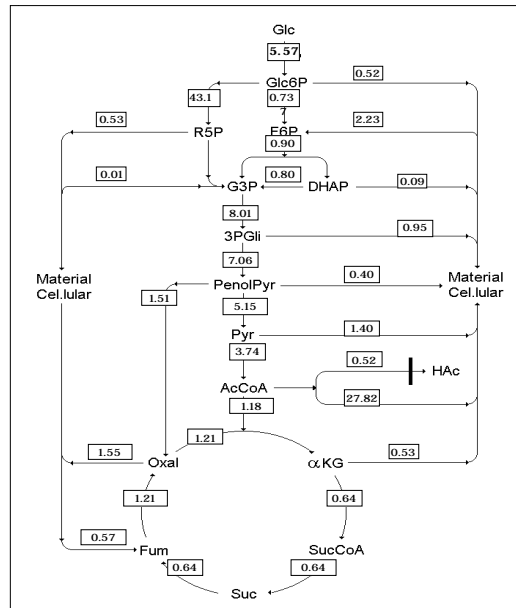


Diagrama de fluxos per la soca K12/pT3 en mmols/ g h

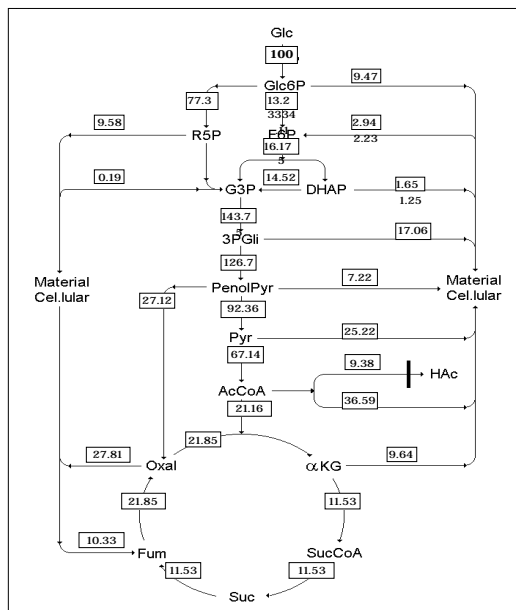


Diagrama de fluxos per la soca K12/pT3 en % respecte els mmols /g h d'entrada de glucosa

**Escherichia coli PPA211/pTSG11 (Control)**

Reacció	Producte	mmols / g h	%
1,00	Preph	226,93	2,65%
2,00	Glu	40,92	0,48%
3,00	Phe	130,20	1,52%
4,00	Tyr	96,72	1,13%
5,00	Asp	2140,94	24,99%
6,00	Asn	167,40	1,95%
7,00	AspSAI	742,49	8,67%
8,00	HoSer	483,62	5,64%
9,00	Thr	375,73	4,39%
10,00	aediAPim	258,86	3,02%
11,00	Lys	238,09	2,78%
12,00	Met	107,88	1,26%
13,00	Ile	200,89	2,34%
14,00	Gln	1852,02	21,62%
15,00	Pro	152,52	1,78%
16,00	Arg	204,61	2,39%
17,00	PRPP	736,67	8,60%
18,00	His	66,96	0,78%
19,00	Ala	419,46	4,90%
20,00	aKiVal	606,39	7,08%
21,00	Val	293,89	3,43%
22,00	Leu	312,49	3,65%
23,00	Ser	1313,25	15,33%
24,00	Gly	851,96	9,94%
25,00	Cys	171,12	2,00%
26,00	PTS	8568,11	100,00%
27,00	F6P	1881,39	21,96%
28,00	DHAP..	2107,69	24,60%
29,00	G3P	1980,76	23,12%
30,00	3PGli	12804,32	149,44%
31,00	PEP	11491,07	134,11%
32,00	PIR	8845,71	103,24%
33,00	PepGlicà	20,77	0,24%
34,00	PilEtamina	100,42	1,17%
35,00	PilGlicol	26,50	0,31%
36,00	CarbP	473,59	5,53%
37,00	Glu	6180,81	72,14%
38,00	AICAR	292,84	3,42%
39,00	DNA	88,83	1,04%
40,00	RNA	539,94	6,30%
41,00	R5P	5957,53	69,53%
42,00	Chor	267,85	3,13%
43,00	G3P	1740,28	20,31%
44,00	PROT	3720,19	43,42%
45,00	PSacch	193,46	2,26%
46,00	AcCoA	6902,58	80,56%
47,00	ALPHA-KG	2384,67	27,83%
48,00	SucCoA	1642,18	19,17%
49,00	Suc	1275,42	14,89%
50,00	Fum	1642,18	19,17%
51,00	Oxal	2436,82	28,44%
52,00	ATP(NADH)	28250,84	329,72%
53,00	ATP(FADH)	1642,18	19,17%
54,00	N5N10MFH4	786,57	9,18%
55,00	N10FFH4	426,76	4,98%
56,00	Acetat	1696,31	19,80%
57,00	CFútils(ADP)	71151,19	830,42%
58,00	Oxal (PEPC)	2088,79	24,38%
59,00	FH4	(-)64.34	

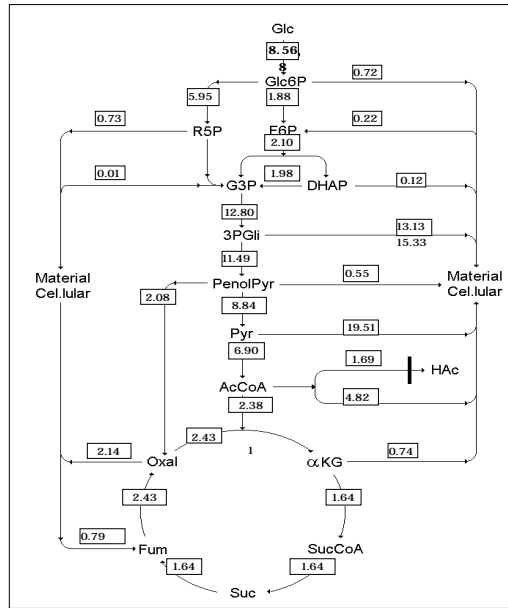


Diagrama de fluxos per la soca PPA211/pTSG11 en mmols / no induïda amb IPTG

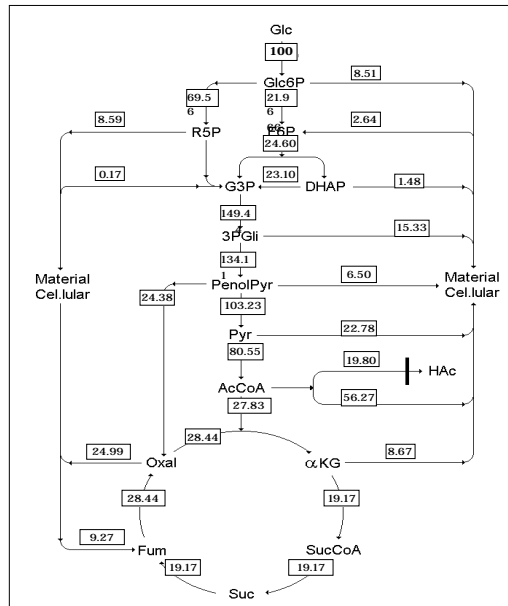


Diagrama de fluxos per la soca PPA211/pTSG11 en % respecte els mmols / g h d'entrada de glucosa no induïda amb IPTG

<i>Escherichia coli</i> PPA211/pTSG11 (induida)			
Reacció	Producte	PTS200	PTS200%
1,00	Preph	52,55	0,83%
2,00	Glu	9,47	0,15%
3,00	Phe	30,15	0,48%
4,00	Tyr	22,40	0,35%
5,00	Asp	495,21	7,83%
6,00	Asn	38,77	0,61%
7,00	AspSAI	171,96	2,72%
8,00	HoSer	112,01	1,77%
9,00	Thr	87,02	1,38%
10,00	aediAPim	59,95	0,95%
11,00	Lys	55,14	0,87%
12,00	Met	24,98	0,39%
13,00	Ile	46,52	0,74%
14,00	Gln	427,87	6,76%
15,00	Pro	35,32	0,56%
16,00	Arg	47,38	0,75%
17,00	PRPP	170,11	2,69%
18,00	His	15,50	0,24%
19,00	Ala	97,13	1,54%
20,00	aKiVal	140,44	2,22%
21,00	Val	68,06	1,08%
22,00	Leu	72,37	1,14%
23,00	Ser	303,77	4,80%
24,00	Gly	196,88	3,11%
25,00	Cys	39,63	0,63%
26,00	PTS	6327,49	100,00%
27,00	F6P	4778,39	75,52%
28,00	DHAP..	4830,82	76,35%
29,00	G3P	4801,37	75,88%
30,00	3PGli	11652,48	184,16%
31,00	PEP	11348,71	179,36%
32,00	PIR	10742,17	169,77%
33,00	PepGlicà	4,80	0,08%
34,00	PilEtamina	23,31	0,37%
35,00	PilGlicol	6,13	0,10%
36,00	CarbP	109,47	1,73%
37,00	Glu	1430,47	22,61%
38,00	AICAR	67,53	1,07%
39,00	DNA	20,53	0,32%
40,00	RNA	124,59	1,97%
41,00	R5P	1380,28	21,81%
42,00	Chor	62,03	0,98%
43,00	G3P	403,38	6,38%
44,00	PROT	861,62	13,62%
45,00	PSacch	44,73	0,71%
46,00	AcCoA	10286,24	162,56%
47,00	ALPHA-KG	3561,34	56,28%
48,00	SucCoA	3389,38	53,57%
49,00	Suc	3304,45	52,22%
50,00	Fum	3389,38	53,57%
51,00	Oxal	3573,01	56,47%
52,00	ATP(NADH)	32943,45	520,64%
53,00	ATP(FADH)	3389,38	53,57%
54,00	N5N10MFH4	181,59	2,87%
55,00	N10FFH4	98,55	1,56%
56,00	Acetat	6070,53	95,94%
57,00	CFútils(ADP)	113400,30	1792,18%
58,00	Oxal (PEPC)	483,55	7,64%
59,00	FH4	(-)14,75	

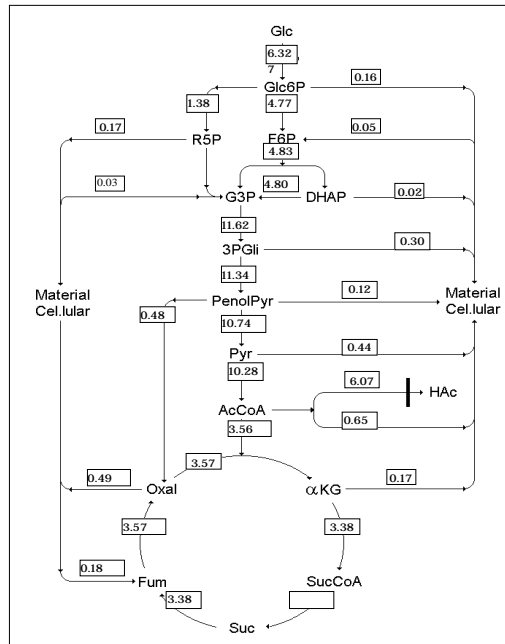
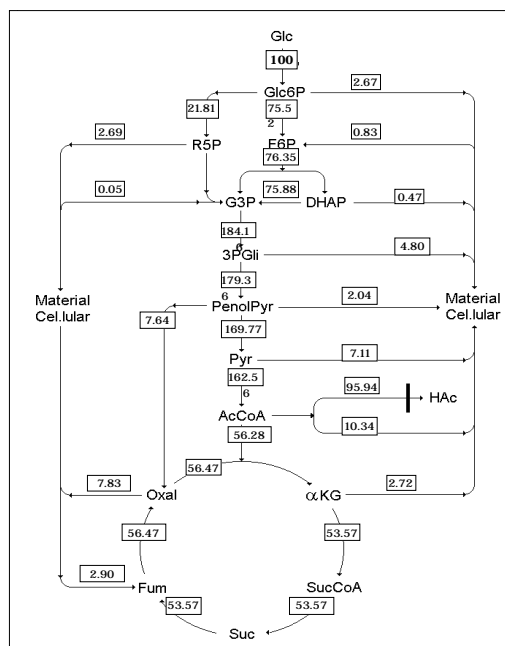


Diagrama de fluxos per la soca PPA211/pTSG11 en mmols / g h induïda amb 200 μM d'IPTG



0,71% Diagrama de fluxos per la soca PPA211/pTSG11 en % respecte els mmols / g h d'entrada de glucosa induïda amb 200 μM d'IPTG