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279	cbdbA1239	DET1300	DehaBAV1_1111	VS1083	universal stress protein family	universal stress protein family	UspA domain protein	UspA domain protein
280	cbdbA1241	DET1303	DehaBAV1_1113	VS1085	fasciclin domain protein	fasciclin domain protein	beta-Ig-H3/fasciclin	beta-Ig-H3/fasciclin
281	cbdbA1244	DET1305	DehaBAV1_1114	VS1086	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
282	cbdbA1245	DET1306	DehaBAV1_1115	VS1087	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
283	cbdbA1247	DET1307	DehaBAV1_1117	VS1089	conserved hypothetical protein	hypothetical protein	protein of unknown function DUF1508	protein of unknown function DUF1508
284	cbdbA1248	DET1308	DehaBAV1_1118	VS1090	putative hydrolase	hydrolase, alpha/beta fold family	alpha/beta hydrolase fold	alpha/beta hydrolase fold
285	cbdbA1249	DET1309	DehaBAV1_1119	VS1091	ATPase, AAA family	ATPase, AAA family	AAA ATPase, central domain protein	AAA ATPase, central domain protein
286	cbdbA1251	DET1310	DehaBAV1_1120	VS1092	conserved domain protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
287	cbdbA1252	DET1311	DehaBAV1_1121	VS1093	hypothetical protein	hypothetical protein	hypothetical protein	hypothetical protein
288	cbdbA1253	DET1313	DehaBAV1_1122	VS1094	conserved hypothetical protein	protein of unknown function /conserved hypothetical protein TIGR00296	protein of unknown function DUF52	protein of unknown function DUF52
289	cbdbA1254	DET1314	DehaBAV1_1123	VS1095	radical SAM domain protein	radical SAM domain protein	Radical SAM domain protein	Radical SAM domain protein
290	cbdbA1255	DET1315	DehaBAV1_1124	VS1096	hypothetical membrane protein	hypothetical protein	protein of unknown function DUF6, transmembrane	protein of unknown function DUF6, transmembrane
291	cbdbB27	DET1317	DehaBAV1_1125	VS1098	conserved domain protein	hypothetical protein	hypothetical protein	hypothetical protein
292	cbdbA1256	DET1318	DehaBAV1_1126	VS1099	conserved hypothetical protein	hypothetical protein	protein of unknown function DUF520	protein of unknown function DUF520
293	cbdbA1260	DET1320	DehaBAV1_1129	VS1101	conserved hypothetical protein	hypothetical protein	AAA ATPase	AAA ATPase
294	cbdbA1264	DET1321	DehaBAV1_1131	VS1103	acetyltransferase, GNAT family	acetyltransferase, GNAT family	GCN5-related N-acetyltransferase	GCN5-related N-acetyltransferase
295	cbdbA1266	DET1322	DehaBAV1_1133	VS1104	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
296	cbdbA1275	DET1328	DehaBAV1_1139	VS1110	putative membrane protein	hypothetical protein	protein of unknown function DUF1385	protein of unknown function DUF1385

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
297	cbdbA1277	DET1330	DehaBAV1_1141	VS1112	acetyltransferase, GNAT family	acetyltransferase, GNAT family	GCN5-related N-acetyltransferase	GCN5-related N-acetyltransferase
298	cbdbA1279	DET1332	DehaBAV1_1143	VS1114	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
299	cbdbA1281	DET1333	DehaBAV1_1144	VS1115	conserved hypothetical protein	hypothetical protein	protein of unknown function DUF107	protein of unknown function DUF107
300	cbdbA1285	DET1336	DehaBAV1_1147	VS1118	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
301	cbdbA1287	DET1337	DehaBAV1_1148	VS1119	hypothetical membrane protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
302	cbdbA1297	DET1347	DehaBAV1_1158	VS1129	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
303	cbdbA1306	DET1355	DehaBAV1_1167	VS1137	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
304	cbdbA1307	DET1356	DehaBAV1_1168	VS1138	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
305	cbdbA1308	DET1357	DehaBAV1_1169	VS1139	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
306	cbdbA1315	DET1364	DehaBAV1_1175	VS1145	conserved hypothetical protein	hypothetical protein	RDD domain containing protein	RDD domain containing protein
307	cbdbA1318	DET1367	DehaBAV1_1178	VS1148	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
308	cbdbA1319	DET1368	DehaBAV1_1179	VS1149	radical SAM domain protein	radical SAM domain protein	Radical SAM domain protein	Radical SAM domain protein
309	cbdbA1320	DET1369	DehaBAV1_1180	VS1150	hypothetical protein	hypothetical protein	hypothetical protein	hypothetical protein
310	cbdbA1322	DET1370	DehaBAV1_1181	VS1151	conserved hypothetical protein	conserved hypothetical protein TIGR00043	protein of unknown function UPF0054	protein of unknown function UPF0054
311	cbdbA1323	DET1371	DehaBAV1_1182	VS1152	NADPH-dependent FMN reductase	NADPH-dependent FMN reductase	NADPH-dependent FMN reductase	NADPH-dependent FMN reductase
312	cbdbA1330	DET1376	DehaBAV1_1187	VS1157	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
313	cbdbA1331	DET1377	DehaBAV1_1188	VS1158	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
314	cbdbA1332	DET1378	DehaBAV1_1189	VS1159	hypothetical membrane protein	hypothetical protein	hypothetical protein	conserved hypothetical membrane protein

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
315	cbdbA1333	DET1379	DehaBAV1_1190	VS1160	auxin-responsive GH3 protein homolog	auxin-responsive GH3 protein homolog, putative	GH3 auxin-responsive promoter	auxin-responsive GH3 protein-like protein
316	cbdbA1335	DET1381	DehaBAV1_1191	VS1162	GGDEF domain	GGDEF domain/HD domain protein	diguanylate cyclase and metal dependent phosphohydrolase	metal dependent phosphohydrolase
317	cbdbA1349	DET1392	DehaBAV1_1201	VS1173	rhodanese-like domain protein	rhodanese-like domain protein	Rhodanese domain protein	Rhodanese domain protein
318	cbdbA1350	DET1393	DehaBAV1_1202	VS1174	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
319	cbdbA1354	DET1395	DehaBAV1_1204	VS1177	GTP-binding protein EngA	GTP-binding protein	small GTP-binding protein	small GTP-binding protein
320	cbdbA1355	DET1396	DehaBAV1_1205	VS1178	conserved hypothetical membrane protein	conserved hypothetical protein TIGR00023	protein of unknown function DUF205	protein of unknown function DUF205
321	cbdbA1363	DET1402	DehaBAV1_1211	VS1184	conserved hypothetical protein	hypothetical protein	Zn-dependent hydrolase of the beta-lactamase fold-like protein	conserved hypothetical protein
322	cbdbA1365	DET1403	DehaBAV1_1212	VS1185	conserved domain protein	hypothetical protein	hypothetical protein	peptidase C14, caspase catalytic subunit p20
323	cbdbA1366	DET1404	DehaBAV1_1213	VS1186	conserved hypothetical protein	conserved hypothetical protein, truncation	exonuclease-like protein	conserved hypothetical protein
324	cbdbA1368	DET1407	DehaBAV1_1214	VS1188	conserved domain protein	BNR/Asp-box repeat domain protein	hypothetical protein	Fibronectin, type III domain protein
325	cbdbA1375	DET1414	DehaBAV1_1221	VS1195	hypothetical membrane protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
326	cbdbA1383	DET1419	DehaBAV1_1227	VS1201	conserved hypothetical protein	transcriptional regulator, AbrB family	transcriptional regulator, AbrB family	transcriptional regulator, AbrB family
327	cbdbA1384	DET1420	DehaBAV1_1228	VS1202	SAM-dependent methyltransferase UbiE/COQ5 family	methyltransferase, UbiE/COQ5 family	Methyltransferase type 11	Methyltransferase type 11
328	cbdbA1385	DET1421	DehaBAV1_1229	VS1203	PP-loop family protein	PP-loop family protein	tRNA(Ile)-lysine synthetase	tRNA(Ile)-lysine synthetase



No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
329	cbdbA1387	DET1423	DehaBAV1_1231	VS1205	peptidase, M48 family	peptidase, M48 family	Ste24 endopeptidase( EC:3.4.24.84 )	Ste24 endopeptidase( EC:3.4.24.84 )
330	cbdbA1388	DET1424	DehaBAV1_1232	VS1206	conserved hypothetical protein	hypothetical protein	Uncharacterized protein-like protein	conserved hypothetical protein
331	cbdbA1389	DET1425	DehaBAV1_1233	VS1207	probable hemolysin-related protein	hypothetical protein	protein of unknown function DUF21	protein of unknown function DUF21
332	cbdbA1394	DET1429	DehaBAV1_1237	VS1211	peptidase, M16 family	peptidase, M16 family	peptidase M16 domain protein	peptidase M16 domain protein
333	cbdbA1405	DET1438	DehaBAV1_1245	VS1219	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
334	cbdbA1414	DET1449	DehaBAV1_1251	VS1228	membrane transporter, MarC family	membrane protein, MarC family	multiple antibiotic resistance (MarC)-related protein	multiple antibiotic resistance (MarC)-related protein
335	cbdbA1416	DET1450	DehaBAV1_1252	VS1229	conserved hypothetical protein	hypothetical protein	cyclase/dehydrase	cyclase/dehydrase
336	cbdbA1417	DET1451	DehaBAV1_1253	VS1230	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
337	cbdbA1418	DET1452	DehaBAV1_1254	VS1231	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
338	cbdbA1420	DET1455	DehaBAV1_1256	VS1233	conserved hypothetical protein	hypothetical protein	amidohydrolase 2	amidohydrolase 2
339	cbdbA1422	DET1457	DehaBAV1_1258	VS1235	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
340	cbdbA1424	DET1458	DehaBAV1_1259	VS1236	putative comF family protein	comF family protein, putative	amidophosphoribosyltransferase-like protein	ComF family protein, putative
341	cbdbA1430	DET1461	DehaBAV1_1262	VS1239	hypothetical periplasmic protein	lipoprotein, putative	secreted protein-like protein	lipoprotein, putative
342	cbdbA1433	DET1463	DehaBAV1_1264	VS1241	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
343	cbdbA1437	DET1465	DehaBAV1_1266	VS1243	integral membrane protein TIGR01906	integral membrane protein TIGR01906	integral membrane protein TIGR01906	integral membrane protein TIGR01906
344	cbdbA1438	DET1466	DehaBAV1_1267	VS1244	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
345	cbdbA1440	DET1468	DehaBAV1_1269	VS1245	conserved hypothetical protein	hypothetical protein	putative regulatory protein, FmdB family	putative regulatory protein, FmdB family
346	cbdbA1465	DET1495	DehaBAV1_1285	VS1271	conserved hypothetical protein	hypothetical protein	Methyltransferase type 12	Methyltransferase type 12

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
347	cbdbA1470	DET1499	DehaBAV1_1289	VS1274	conserved hypothetical protein	hypothetical protein	Helix-turn-helix, type 11 domain protein	Helix-turn-helix, type 11 domain protein
348	cbdbA1471	DET1500	DehaBAV1_1290	VS1275	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
349	cbdbA1474	DET1502	DehaBAV1_1292	VS1276	major facilitator family transporter	major facilitator family protein	major facilitator superfamily MFS_1	major facilitator superfamily MFS_1
350	cbdbA1477	DET1504	DehaBAV1_1294	VS1278	iron(II) transport protein A	ferrous iron transport protein A, putative	FeoA family protein	FeoA family protein
351	cbdbA1479	DET1506	DehaBAV1_1296	VS1280	SsrA-binding protein	SsrA-binding protein	SsrA-binding protein	SsrA-binding protein
352	cbdbA1646	DET1564	DehaBAV1_1309	VS1443	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
353	cbdbA1649	DET1568	DehaBAV1_1313	VS1446	hypothetical membrane protein	hypothetical protein	hypothetical protein	conserved hypothetical membrane protein
354	cbdbA1650	DET1569	DehaBAV1_1314	VS1447	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
355	cbdbA1670	DET1582	DehaBAV1_1331	VS1461	conserved domain protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
356	cbdbA1671	DET1584	DehaBAV1_1332	VS1468	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
357	cbdbA1673	DET1585	DehaBAV1_1333	VS1469	conserved hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
358	cbdbA1675	DET1586	DehaBAV1_1334	VS1470	lemA family protein	lemA family protein	LemA family protein	LemA family protein
359	cbdbA1677	DET1587	DehaBAV1_1335	VS1471	putative peptidase	peptidase, M28 family	peptidase M48, Ste24p	peptidase M48, Ste24p
360	cbdbA1684	DET1592	DehaBAV1_1340	VS1476	AIR synthase domain protein	AIR synthase domain protein	AIR synthase related protein domain protein	AIR synthase related protein domain protein
361	cbdbA1686	DET1595	DehaBAV1_1342	VS1478	ApbE	ApbE/NosX family protein	ApbE family lipoprotein	ApbE family lipoprotein
362	cbdbA1702	DET1608	DehaBAV1_1354	VS1490	KH domain protein	KH domain/HDIG domain protein	metal dependent phosphohydrolase	metal dependent phosphohydrolase
363	cbdbA1703	DET1609	DehaBAV1_1355	VS1491	conserved hypothetical protein	Ser/Thr protein phosphatase family protein	metallophosphoesterase	metallophosphoesterase

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
364	cbdbA1704	DET1610	DehaBAV1_1356	VS1492	PHP domain N-terminal region family protein	PHP domain N-terminal region family protein	PHP C-terminal domain protein	PHP C-terminal domain protein
365	cbdbA1705	DET1611	DehaBAV1_1357	VS1493	conserved hypothetical membrane protein	hypothetical protein	protein of unknown function DUF205	protein of unknown function DUF205
366	cbdbA1707	DET1613	DehaBAV1_1359	VS1495	conserved hypothetical protein TIGR00104	conserved hypothetical protein TIGR00104	protein of unknown function UPF0066	protein of unknown function UPF0066
367	cbdbA1709	DET1615	DehaBAV1_1361	VS1497	HIT domain protein	HIT domain protein	histidine triad (HIT) protein	histidine triad (HIT) protein
368	cbdbA1711	DET1617	DehaBAV1_1363	VS1499	conserved hypothetical protein	hypothetical protein	protein of unknown function DUF74	protein of unknown function DUF74
369	cbdbA1717	DET1621	DehaBAV1_1367	VS1503	hypothetical protein	hypothetical protein	cell wall/surface repeat protein	cell wall/surface repeat protein
370	cbdbA1718	DET1622	DehaBAV1_1368	VS1504	conserved hypothetical protein	hypothetical protein	DNA-binding protein with PD1-like DNA-binding-like protein	conserved hypothetical protein
371	cbdbA1720	DET1623	DehaBAV1_1369	VS1505	putative desulfiredoxin	desulfiredoxin, putative	Desulfoferredoxin Dfx domain protein	Desulfoferredoxin Dfx domain protein
372	cbdbA1721	DET1624	DehaBAV1_1370	VS1506	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
373	cbdbA1727	DET1629	DehaBAV1_1374	VS1511	radical SAM domain protein	radical SAM domain protein	Radical SAM domain protein	Radical SAM domain protein
374	cbdbA1729	DET1631	DehaBAV1_1376	VS1513	TPR domain protein	TPR domain protein	TPR repeat-containing protein	TPR repeat-containing protein
375	cbdbA1730	DET1632	DehaBAV1_1377	VS1514	nifU protein, homolog	NifU-like protein	nitrogen-fixing NifU domain protein	HesB/YadR/YfhF-family protein
376	cbdbA1733	DET1634	DehaBAV1_1379	VS1516	hypothetical protein	hypothetical protein	hypothetical protein	conserved hypothetical protein
377	cbdbA1735	DET1637	DehaBAV1_1381	VS1519	mazG family protein	mazG family protein	MazG family protein	MazG family protein
378	cbdbA1737	DET1638	DehaBAV1_1382	VS1520	conserved hypothetical protein	hypothetical protein	peptidase, membrane zinc metallopeptidase, putative	peptidase, membrane zinc metallopeptidase, putative
379	cbdbA1015	DET1040	DehaBAV1_0922	VS910	putative inner membrane protein, 60 kDa	inner membrane protein, 60 kDa	putative inner membrane protein, 60 kDa	60 kDa inner membrane insertion protein
380	cbdbA1640	DET1548	DehaBAV1_1304	VS1438	conserved hypothetical protein	hypothetical protein	conserved hypothetical protein	protein of unknown function DUF62

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
381	cbdbA195	DET0187	DehaBAV1_0165	VS176	formate dehydrogenase, major subunit	formate dehydrogenase, alpha subunit( EC:1.2.1.2 )	formate dehydrogenase, alpha subunit( EC:1.2.1.2 )	formate dehydrogenase, alpha subunit( EC:1.2.1.2 )
382	cbdbA193	DET0186	DehaBAV1_0166	VS175	formate dehydrogenase, membrane subunit	formate dehydrogenase, membrane subunit, putative	Polysulphide reductase, NrfD	Polysulphide reductase, NrfD
383	cbdbA191	DET0185	DehaBAV1_0167	VS174	formate dehydrogenase accessory protein	formate dehydrogenase accessory protein FdhE, putative	Uncharacterized protein involved in formate dehydrogenase formation-like protein	formate dehydrogenase accessory protein FdhE, putative
384	cbdbA121	DET0103	DehaBAV1_0265	VS113	putative molybdopterin oxidoreductase, iron-sulfur binding subunit	molybdopterin oxidoreductase, iron-sulfur binding subunit, putative	4Fe-4S ferredoxin, iron-sulfur binding domain protein	4Fe-4S ferredoxin, iron-sulfur binding domain protein
385	cbdbA120	DET0102	DehaBAV1_0266	VS112	putative molybdopterin oxidoreductase, membrane subunit	molybdopterin oxidoreductase, membrane subunit, putative	Polysulphide reductase, NrfD	Polysulphide reductase, NrfD
386	cbdbA118	DET0101	DehaBAV1_0267	VS111	molybdopterin oxidoreductase	molybdopterin oxidoreductase	molybdopterin oxidoreductase Fe4S4 region	molybdopterin oxidoreductase
387	cbdbA115	DET0099	DehaBAV1_0269	VS109	putative molybdopterin-guanine dinucleotide biosynthesis protein A	mobA family protein	4-diphosphocytidyl-2C-methyl-D-erythritol synthase	MobA family protein
388	cbdbA134	DET0115	DehaBAV1_0254	VS124	ABC transporter, permease protein	ABC transporter, permease protein, putative	ABC-2 type transporter	ABC-2 type transporter
389	cbdbA133	DET0114	DehaBAV1_0255	VS123	ABC transporter, permease protein	ABC transporter, substrate-binding protein, putative	ABC-2 type transporter	ABC-2 type transporter
390	cbdbA271	DET0331	DehaBAV1_0311	VS273	cation efflux family protein	cation efflux family protein	cation diffusion facilitator family transporter	cation diffusion facilitator family transporter

No	CBDB1 core hypothetical genes	195 core hypothetical genes	BAV1 core hypothetical genes	VS core hypothetical genes	CBDB1 annotation	195 annotation	BAV1 annotation	VS annotation
391	cbdbA273	DET0332	DehaBAV1_0312	VS274	protein-export membrane protein SecF	protein-export membrane protein SecF	protein-export membrane protein SecF	protein-export membrane protein SecF
392	cbdbA274	DET0333	DehaBAV1_0313	VS275	protein-export membrane protein SecD	protein-export membrane protein SecD	protein-export membrane protein SecD	protein-export membrane protein SecD
393	cbdbA360	DET0408	DehaBAV1_0387	VS351	cation channel family protein	cation channel family protein	Ion transport protein	Ion transport protein
394	cbdbA1715	DET1619	DehaBAV1_1365	VS1501	ABC transporter, ATP-binding protein	ABC transporter, ATP-binding protein	ABC transporter related	ABC transporter related
395	cbdbA1716	DET1620	DehaBAV1_1366	VS1502	putative ABC-transporter, permease component	hypothetical protein	hypothetical protein	membrane protein, putative
396	cbdbA1289	DET1339	DehaBAV1_1150	VS1121	ABC transporter, ATP-binding protein	ABC transporter, ATP-binding protein	ABC transporter related	ABC transporter related
397	cbdbA1290	DET1340	DehaBAV1_1151	VS1122	ABC transporter, permease protein	ABC transporter, permease protein, putative	ABC-2 type transporter	ABC transporter, permease protein
398	cbdbA772	DET0793	DehaBAV1_0719	VS699	ABC transporter associated protein with signal peptide, putative periplasmic substrate binding subunit	hypothetical protein	hypothetical protein	ABC transporter associated protein with signal peptide, putative periplasmic substrate binding subunit
399	cbdbA773	DET0794	DehaBAV1_0720	VS700	ABC transporter, ATP-binding protein	ABC transporter, ATP-binding protein	ABC transporter related	ABC transporter related
400	cbdbA774	DET0795	DehaBAV1_0721	VS701	ABC transporter, permease protein	ABC transporter, permease protein	ABC-2 type transporter	ABC-2 type transporter
401	cbdbA791	DET0814	DehaBAV1_0734	VS718	ABC transporter, permease protein	ABC transporter, permease protein	ABC-2 type transporter	ABC-2 type transporter
402	cbdbA793	DET0815	DehaBAV1_0735	VS719	iron-regulated ABC transporter, atp-binding protein, SufC	FeS assembly ATPase SufC, putative	ABC transporter related	ABC transporter related
403	cbdbA794	DET0816	DehaBAV1_0736	VS720	iron-regulated ABC transporter, subunit SufB-related	sufB/sufD domain protein	SufBD protein	SufBD protein

**Table 17. List of Exchange Reactions of *i*AI549**

No	Abbreviation	Equation
1	EX_ac(e)	[e] : ac <==>
2	EX_antim(e)	[e] : antim <==>
3	EX_arsna(e)	[e] : arsna <==>
4	EX_arsni2(e)	[e] : arsni2 <==>
5	EX_cbl1(e)	[e] : cbl1 <==>
6	EX_cit(e)	[e] : cit <==>
7	EX_cl(e)	[e] : cl <==>
8	EX_co2(e)	[e] : co2 <==>
9	EX_cobalt2(e)	[e] : cobalt2 <==>
10	EX_cu2(e)	[e] : cu2 <==>
11	EX_dcb(e)	[e] : dcb <==>
12	EX_etl(e)	[e] : etl <==>
13	EX_fe2(e)	[e] : fe2 <==>
14	EX_gln-L(e)	[e] : gln-L <==>
15	EX_glyb(e)	[e] : glyb <==>
16	EX_h(e)	[e] : h <==>
17	EX_h2(e)	[e] : h2 <==>
18	EX_h2o(e)	[e] : h2o <==>
19	EX_hcb(e)	[e] : hcb <==>
20	EX_ile-L(e)	[e] : ile-L <==>
21	EX_k(e)	[e] : k <==>
22	EX_leu-L(e)	[e] : leu-L <==>
23	EX_mg2(e)	[e] : mg2 <==>
24	EX_mn2(e)	[e] : mn2 <==>
25	EX_mobd(e)	[e] : mobd <==>
26	EX_n2(e)	[e] : n2 <==>
27	EX_nh4(e)	[e] : nh4 <==>
28	EX_ni2(e)	[e] : ni2 <==>
29	EX_pce(e)	[e] : pce <==>
30	EX_pi(e)	[e] : pi <==>
31	EX_pro-L(e)	[e] : pro-L <==>
32	EX_so4(e)	[e] : so4 <==>
33	EX_tsul(e)	[e] : tsul <==>

No	Abbreviation	Equation
34	EX_val-L(e)	[e] : val-L <===>
35	EX_zn2(e)	[e] : zn2 <===>

**Table 18. Set of Constraints for Simulating *Dehalococcoides* Growth using *i*AI549**

Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
AACPAT	[c] : ACP + accoa --> acACP + coa	0	Infinity	0.00	2.3.1.38
ABTA	[c] : 4abut + akg --> glu-L + succal	0	Infinity	0.00	2.6.1.19
ACBIPGT	[c] : adcobap + gtp + h --> adgcoba + ppi	0	Infinity	0.00	
ACCOAC	[c] : accoa + atp + hco3 --> adp + h + malcoa + pi	0	Infinity	0.02	6.4.1.2
ACGK	[c] : acglu + atp --> acg5p + adp	0	Infinity	0.01	2.7.2.8
ACGS	[c] : accoa + glu-L --> acglu + coa + h	0	Infinity	0.00	2.3.1.1
ACHBS	[c] : 2obut + h + pyr --> 2ahbut + co2	0	Infinity	0.00	
ACLS	[c] : h + (2) pyr --> alac-S + co2	0	Infinity	0.01	4.1.3.18
ACMAT1	[c] : acACP + h + malACP --> ACP + actACP + co2	0	Infinity	0.00	2.3.1.41
ACONT	[c] : cit <==> icit	-Infinity	Infinity	0.00	4.2.1.3
ACOTA	[c] : acorn + akg <==> acg5sa + glu-L	-Infinity	Infinity	-0.01	2.6.1.11
ACPS1	[c] : apoACP + coa --> ACP + h + pap	0	Infinity	0.00	2.7.8.7
ACS	[c] : ac + atp + coa --> accoa + amp + ppi	0	Infinity	0.19	6.2.1.1
ACt6	ac[e] + h[e] <==> ac[c] + h[c]	-Infinity	Infinity	0.18	
ADCL	[c] : 4adcho --> 4abz + h + pyr	0	Infinity	0.00	
ADCOBAK	[c] : adcoba + atp --> adcobap + adp + h	0	Infinity	0.00	
ADCOBAS	[c] : 1ap2ol + adcobhex --> adcoba + h2o	0	Infinity	0.00	
ADCOBHEXS	[c] : adcobdam + (4) atp + (4) gln-L + (4) h2o --> adcobhex + (4) adp + (4) glu-L + (4) h + (4) pi	0	Infinity	0.00	
ADCOBHS	[c] : 1ap2ol + adcobhex <==> adcoba + h2o	-Infinity	Infinity	0.00	3.5.1
ADCPS2	[c] : 1ap2olp + adcobhex + atp --> adcobap + adp + h + pi	0	Infinity	0.00	
ADCS	[c] : chor + gln-L --> 4adcho + glu-L	0	Infinity	0.00	
ADD	[c] : ade + h + h2o --> hxan + nh4	0	Infinity	0.00	3.5.4.2
ADK1	[c] : amp + atp <==> (2) adp	-Infinity	Infinity	0.26	2.7.4.3
ADK2	[c] : amp + pppi <==> adp + ppi	-Infinity	Infinity	0.00	2.7.4.3
ADK3	[c] : amp + gtp <==> adp + gdp	-Infinity	Infinity	0.00	2.7.4.8
ADK4	[c] : amp + itp <==> adp + idp	-Infinity	Infinity	0.00	
ADNCYC	[c] : atp --> camp + ppi	0	Infinity	0.00	4.6.1.1
ADNK1	[c] : adn + atp --> adp + amp + h	0	Infinity	0.00	2.7.1.20
ADPRDP	[c] : adprib + h2o --> amp + (2) h + r5p	0	Infinity	0.00	3.6.1.13
ADPT	[c] : ade + prpp --> amp + ppi	0	Infinity	0.00	2.4.2.7
ADSL1	[c] : dcamp --> amp + fum	0	Infinity	0.00	4.3.2.2
ADSL2	[c] : 25aics --> aicar + fum	0	Infinity	0.00	4.3.2.2
ADSS	[c] : asp-L + gtp + imp --> dcamp + gdp + (2) h + pi	0	Infinity	0.00	6.3.4.4
AGMT	[c] : agm + h2o --> ptrc + urea	0	Infinity	0.00	3.5.3.11
AGPR	[c] : acg5sa + nadp + pi <==> acg5p + h + nadph	-Infinity	Infinity	-0.01	1.2.1.38



Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
AHC	[c] : ahcys + h2o <==> adn + hcys-L	-Infinity	Infinity	0.00	3.3.1.1
AHMMPs	[c] : air + h2o --> 4ahmmp + gcald + (0.5) o2 + pi	0	Infinity	0.00	
AICART	[c] : 10fthf + aicar <==> fprica + thf	-Infinity	Infinity	0.01	2.1.2.3
AIRC	[c] : air + co2 --> 5aizc + h	0	Infinity	0.00	4.1.1.21
ALAALA	[c] : (2) ala-D + atp <==> adp + alaala + h + pi	-Infinity	Infinity	0.00	6.3.2.4
ALAR	[c] : ala-L <==> ala-D	-Infinity	Infinity	0.00	5.1.1.1
ALATA_D2	[c] : ala-D + pydx5p --> pyam5p + pyr	0	Infinity	0.00	
ALATA_L	[c] : akg + ala-L <==> glu-L + pyr	-Infinity	Infinity	-0.01	2.6.1.2
ALATA_L2	[c] : ala-L + pydx5p --> pyam5p + pyr	0	Infinity	0.00	
ALATRS	[c] : ala-L + atp + trnaala --> alatrna + amp + ppi	0	Infinity	0.00	6.1.1.7
ALCD19	[c] : glyald + h + nadh <==> glyc + nad	-Infinity	Infinity	0.00	1.1.1.1
ALCD2x	[c] : etoh + nad <==> acald + h + nadh	-Infinity	Infinity	0.00	1.1.1.1
ALCD3	[c] : nad + ppoh <==> h + nadh + ppal	-Infinity	Infinity	0.00	1.1.1.1
ALDD8b	[c] : glyald + h2o + nad <==> glyc-R + (2) h + nadh	-Infinity	Infinity	0.00	1.2.1.3
AMAOT	[c] : 8aonn + amet <==> amob + dann	-Infinity	Infinity	0.00	2.6.1.62
AMPMS	[c] : air + h2o --> 4ampm + (2) for + (4) h	0	Infinity	0.00	
ANPRT	[c] : anth + prpp --> ppi + pran	0	Infinity	0.00	2.4.2.18
ANS1	[c] : chor + gln-L --> anth + glu-L + h + pyr	0	Infinity	0.00	4.1.3.27
ANTIMt1	antim[c] --> antim[e]	0	Infinity	0.00	
APRAUR	[c] : 5apru + h + nadph --> 5aprbu + nadp	0	Infinity	0.00	1.1.1.193
APSPT	[c] : aps + trdrd <==> amp + (2) h + so3 + trdox	-Infinity	Infinity	0.00	
APYRH	[c] : 3fpyr + h2o --> fum + h + pyr	0	Infinity	0.00	3.7.1.5
ARGDC	[c] : arg-L + h --> agm + co2	0	Infinity	0.00	4.1.1.19
ARGSL	[c] : argsuc <==> arg-L + fum	-Infinity	Infinity	0.00	4.3.2.1
ARGSS	[c] : asp-L + atp + citr-L --> amp + argsuc + h + ppi	0	Infinity	0.00	6.3.4.5
ARGTRS	[c] : arg-L + atp + trnaarg --> amp + argtrna + ppi	0	Infinity	0.00	6.1.1.19
ARSNA1	arsna[c] --> arsna[e]	0	Infinity	0.00	
ARSt1	arsni2[c] --> arsni2[e]	0	Infinity	0.00	
ASAD	[c] : aspsa + nadp + pi <==> 4pasp + h + nadph	-Infinity	Infinity	-0.01	1.2.1.11
ASNS2	[c] : asp-L + atp + nh4 --> amp + asn-L + h + ppi	0	Infinity	0.00	6.3.1.1
ASP1DC	[c] : asp-L + h --> ala-B + co2	0	Infinity	0.00	4.1.1.11
ASPCT	[c] : asp-L + cbp --> cbasp + h + pi	0	Infinity	0.01	2.1.3.2
ASPK	[c] : asp-L + atp <==> 4pasp + adp	-Infinity	Infinity	0.01	2.7.2.4
ASPO1	[c] : asp-L + nad --> (2) h + iasp + nadh	0	Infinity	0.00	
ASPO3	[c] : asp-L + ubq8 --> h + iasp + ubq8h2	0	Infinity	0.00	
ASPO4	[c] : asp-L + mqn8 --> h + iasp + mql8	0	Infinity	0.00	
ASPO5	[c] : asp-L + fum --> h + iasp + succ	0	Infinity	0.00	
ASPO6	[c] : asp-L + o2 --> h + h2o2 + iasp	0	Infinity	0.00	

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ASPT	[c] : asp-L --> fum + nh4	0	Infinity	0.00	4.3.1.1
ASPTA1	[c] : akgl + asp-L <==> glu-L + oaa	-Infinity	Infinity	-0.04	2.6.1.1
ASPTRS	[c] : asp-L + atp + trnaasp --> amp + asptrna + ppi	0	Infinity	0.00	6.1.1.12
ATPM	[c] : atp + h2o --> adp + h + pi	1.8	1.8	1.80	
ATPPRT	[c] : atp + prpp --> ppi + prbatp	0	Infinity	0.00	2.4.2.17
ATPS3r	adp[c] + (3) h[e] + pi[c] <==> atp[c] + (2) h[c] + h2o[c]	-Infinity	Infinity	3.50	
BACCL	[c] : atp + btn + h --> btamp + ppi	0	Infinity	0.00	6.3.4.15
BTMAT1	[c] : 2beACP + h + nadh --> butACP + nad	0	Infinity	0.00	1.3.1.10
BTS	[c] : dtbt + (2) s --> btn + h + h2s	0	Infinity	0.00	2.8.1.6
CBIAT	[c] : atp + cbi + h2o <==> adcoaba + pi + ppi	-Infinity	Infinity	0.00	2.5.1.17
CBL1abc	atp[c] + cbl1[e] + h2o[c] --> adp[c] + cbl1[c] + h[c] + pi[c]	0	Infinity	0.00	
CBLATr	[c] : atp + cbl1 + h <==> adocbl + ppi	-Infinity	Infinity	0.00	2.5.1.17
CBPSr	[c] : (2) atp + gln-L + h2o + hco3 <==> (2) adp + cbp + glu-L + (2) h + pi	-Infinity	Infinity	0.01	6.3.5.5
CDGPT	[c] : cdpdag + glyc3p --> cmp + h + pglyp	0	Infinity	0.00	
CDPDSP	[c] : cdpdag + ser-L --> cmp + h + ps	0	Infinity	0.00	2.7.8.8
CDPMEK	[c] : 4c2me + atp --> 2p4c2me + adp + h	0	Infinity	0.00	
CERD	(8) fdred[c] + (4) h[c] + pce[e] --> (4) c[e] + etl[e] + (8) fdox[c]	0	Infinity	0.00	
CHORM	[c] : chor --> pphn	0	Infinity	0.00	5.4.99.5
CHORS	[c] : 3psme --> chor + pi	0	Infinity	0.01	4.2.3.5
CITRMS	[c] : accoa + h + h2o + pyr <==> citmal + coa	-Infinity	Infinity	0.00	2.3.1
CITt6	cit[e] + h[e] <==> cit[c] + h[c]	-Infinity	Infinity	0.00	
CLPNS	[c] : cdpdag + pgly --> cdlp + cmp + h	0	Infinity	0.00	
CMLDC	[c] : 2c25dho + h --> 5odhf2a + co2	0	Infinity	0.00	4.1.1.44
CO2t	co2[e] <==> co2[c]	-Infinity	Infinity	0.17	
COBALt5	cobalt2[c] <==> cobalt2[e]	-Infinity	Infinity	0.00	
COBPS	[c] : adgcoba + rdmbzi --> cobamcoa + gmp + h	0	Infinity	0.00	
COBPS2	[c] : adgcoba + rdmbzi <==> adocbl + gmp + h	-Infinity	Infinity	0.00	
CODHr	[c] : co + (2) fdox + h2o <==> co2 + (2) fdred + (2) h	-Infinity	Infinity	0.00	1.2.99.2
CPC3MT	[c] : amet + copre3 + h --> ahcys + copre4	0	Infinity	0.00	2.1.1.131
CPC6MT	[c] : (2) amet + codhpre6 --> (2) ahcys + co2 + copre8 + h	0	Infinity	0.00	2.1.1.132
CPPPGOAN2	[c] : (2) amet + cpppg3 + (4) fdox + (2) nadph --> (2) co2 + (2) dad-5 + (4) fdred + (2) h + (2) met-L + (2) nadp + pppg9	0	Infinity	0.00	
CTPS1	[c] : atp + nh4 + utp --> adp + ctp + (2) h + pi	0	Infinity	0.00	6.3.4.2

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CTPS2	[c] : atp + gln-L + h2o + utp --> adp + ctp + glu-L + (2) h + pi	0	Infinity	0.00	6.3.4.2
Cuabc	atp[c] + cu2[e] + h2o[c] --> adp[c] + cu2[c] + h[c] + pi[c]	0	Infinity	0.00	
CYRDAAT	[c] : atp + co1dam + h --> adco1dam + pppi	0	Infinity	0.00	2.5.1.17
CYRDAS	[c] : (4) atp + (2) cobrmt + (4) gln-L + (2) h2o --> (4) adp + (2) co2dam + (4) glu-L + (2) h + (2) ppi	0	Infinity	0.00	
CYSS	[c] : acser + h2s --> ac + cys-L	0	Infinity	0.00	4.2.99.8
CYSTRS	[c] : atp + cys-L + trnacys --> amp + cystrna + ppi	0	Infinity	0.00	6.1.1.16
CYTK1	[c] : atp + cmp <==> adp + cdp	-Infinity	Infinity	0.00	2.7.4.14
CYTK2	[c] : atp + dcmp <==> adp + dcdp	-Infinity	Infinity	0.00	2.7.4.14
DADK	[c] : atp + damp <==> adp + dadp	-Infinity	Infinity	0.00	2.7.4.11
DAGK	[c] : 12dgr + atp --> 12dag3p + adp + h	0	Infinity	0.00	2.7.1.107
DAHPS	[c] : e4p + h2o + pep --> 2dda7p + pi	0	Infinity	0.01	4.1.2.15
DAPAT	[c] : 26dap-LL + akglu <==> glu-L + h + h2o + thdp	-Infinity	Infinity	-0.01	
DAPDC	[c] : 26dap-M + h --> co2 + lys-L	0	Infinity	0.01	4.1.1.20
DAPE	[c] : 26dap-LL <==> 26dap-M	-Infinity	Infinity	0.01	5.1.1.7
DB4PS	[c] : ru5p-D --> db4p + for + h	0	Infinity	0.00	
DCMPDA2ir	[c] : dcmp + h + h2o --> dump + nh4	0	Infinity	0.00	3.5.4.12
DCMPDA3ir	[c] : cmp + h + h2o --> nh4 + ump	0	Infinity	0.00	3.5.4.12
DDMAT5	[c] : 2tddACP + h + nadh --> ddcaACP + nad	0	Infinity	0.00	1.3.1.10
DEMAT4	[c] : 2tdeACP + h + nadh --> decACP + nad	0	Infinity	0.00	1.3.1.10
DGK1	[c] : atp + dgmp <==> adp + dgdp	-Infinity	Infinity	0.00	
DGTPH	[c] : dgtp + h2o --> dgsn + pppi	0	Infinity	0.00	3.1.5.1
DHAD1	[c] : 23dhmb --> 3mob + h2o	0	Infinity	0.01	4.2.1.9
DHAD2	[c] : 23dhmp --> 3mop + h2o	0	Infinity	0.00	
DHAD3	[c] : 23dhmp --> 2o3mpt + h2o	0	Infinity	0.00	4.2.1.9
DHDPRy	[c] : 23dhdp + h + nadph --> nadp + thdp	0	Infinity	0.01	1.3.1.26
DHDPS	[c] : aspsa + pyr --> 23dhdp + h + (2) h2o	0	Infinity	0.01	4.2.1.52
DHFOR2	[c] : dhf + nadp <==> fol + nadph	-Infinity	Infinity	0.00	1.5.1.3
DHFOR3	[c] : fol + h + (2) nadph <==> (2) nadp + thf	-Infinity	Infinity	0.00	1.5.1.3
DHFR	[c] : dhf + h + nadph <==> nadp + thf	-Infinity	Infinity	0.00	1.5.1.3
DHFS	[c] : atp + dhpt + glu-L --> adp + dhf + h + pi	0	Infinity	0.00	6.3.2.12
DHNAOT	[c] : dhna + nad + octdp --> 2dmmq8 + co2 + nadh + ppi	0	Infinity	0.00	
DHNPA	[c] : dhnpt --> 2ahhmp + gcald	0	Infinity	0.00	4.1.2.25
DHORDf	[c] : dhor-S + (2) fdox <==> (2) fdred + (2) h + orot	-Infinity	Infinity	0.01	1.3.99.11
DHORTS	[c] : dhor-S + h2o <==> cbasp + h	-Infinity	Infinity	-0.01	3.5.2.3
DHPDA2	[c] : 25dhpp + h + h2o --> 5apru + nh4	0	Infinity	0.00	3.5.4.26

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DHPS1	[c] : 2ahhmp + 4abz --> dhpt + h2o	0	Infinity	0.00	2.5.1.15
DHPS3	[c] : 2ahhmd + 4abz --> dhpt + ppi	0	Infinity	0.00	2.5.1.15
DHQD	[c] : 3dhq <==> 3dhsk + h2o	-Infinity	Infinity	0.01	4.2.1.10
DHQS	[c] : 2dda7p --> 3dhq + pi	0	Infinity	0.01	4.2.3.4
DMATT	[c] : dmpp + ipdp --> grdp + ppi	0	Infinity	0.00	2.5.1.1
DMPPS	[c] : h + h2mb4p + nadh --> dmpp + h2o + nad	0	Infinity	0.00	
DMQMT	[c] : 2omhmb1 + amet --> ahcys + h + ubq8h2	0	Infinity	0.00	
DNMPPA	[c] : dhmp + h2o --> dhnt + pi	0	Infinity	0.00	
DNTPPA	[c] : ahdt + h2o --> dhmp + h + ppi	0	Infinity	0.00	
DPCOAK	[c] : atp + dpcoa --> adp + coa + h	0	Infinity	0.00	2.7.1.24
DPR	[c] : 2dhp + h + nadph --> nadp + pant-R	0	Infinity	0.00	1.1.1.169
DTMPK	[c] : atp + dtmp <==> adp + dtdp	-Infinity	Infinity	0.00	2.7.4.9
DUTPDP	[c] : dutp + h2o --> dump + h + ppi	0	Infinity	0.00	3.6.1.23
DXPRI	[c] : dxy15p + h + nadph <==> 2me4p + nadp	-Infinity	Infinity	0.00	
DXPS	[c] : g3p + h + pyr --> co2 + dxy15p	0	Infinity	0.00	
E4PD	[c] : e4p + h2o + nad <==> 4per + (2) h + nadh	-Infinity	Infinity	0.00	
ENO	[c] : 2pg <==> h2o + pep	-Infinity	Infinity	-0.03	4.2.1.11
F1PK	[c] : atp + f1p --> adp + fdp + h	0	Infinity	0.00	2.7.1.56
FA120ACPH	[c] : ddcaACP + h2o <==> ACP + ddca + h	-Infinity	Infinity	0.00	3.1.2.14
FA140ACPH	[c] : h2o + myrsACP <==> ACP + h + ttdca	-Infinity	Infinity	0.00	3.1.2.14
FA160ACPH	[c] : h2o + palmACP <==> ACP + h + hdca	-Infinity	Infinity	0.00	3.1.2.14
FA180ACPH	[c] : h2o + ocdACP <==> ACP + h + ocdca	-Infinity	Infinity	0.00	3.1.2.14
FA200ACPH	[c] : h2o + icsACP <==> ACP + h + icsa	-Infinity	Infinity	0.00	3.1.2.14
FACOAL120	[c] : atp + coa + ddca <==> amp + ddcoa + ppi	-Infinity	Infinity	0.00	6.2.1.3
FACOAL140	[c] : atp + coa + ttdca <==> amp + ppi + tdcoa	-Infinity	Infinity	0.00	6.2.1.3
FACOAL160	[c] : atp + coa + hdca <==> amp + pmtcoa + ppi	-Infinity	Infinity	0.00	6.2.1.3
FACOAL170(IS O)	[c] : atp + coa + fa11 <==> amp + fa11coa + ppi	-Infinity	Infinity	0.00	6.2.1.3
FACOAL180	[c] : atp + coa + ocdca <==> amp + ppi + strcoa	-Infinity	Infinity	0.00	6.2.1.3
FACOAL181	[c] : atp + coa + ocdcea <==> amp + odecoca + ppi	-Infinity	Infinity	0.00	6.2.1.3
FACOAL200	[c] : atp + coa + icsa <==> amp + icscoa + ppi	-Infinity	Infinity	0.00	6.2.1.3
FBA	[c] : fdp <==> dhap + g3p	-Infinity	Infinity	-0.01	4.1.2.13
FBP	[c] : fdp + h2o --> f6p + pi	0	Infinity	0.01	3.1.3.11
FCLPA	[c] : fc1p <==> dhap + lald-L	-Infinity	Infinity	0.00	4.1.2.17
FDTs	[c] : dump + fadh2 + mlthf --> dtmp + fad + thf	0	Infinity	0.00	
FE2abc	atp[c] + fe2[e] + h2o[c] --> adp[c] + fe2[c] + h[c] + pi[c]	0	Infinity	0.00	
FMETDF	[c] : fmet + h2o --> for + met-L	0	Infinity	0.00	3.5.1.31
FMETTRS	[c] : 10fthf + mettrna --> fmettrna + thf	0	Infinity	0.00	2.1.2.9
FMNAT	[c] : atp + fmn + h --> fad + ppi	0	Infinity	0.00	2.7.7.2

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FNOR2	[c] : (2) fdred + h + nadp <==> (2) fdox + nadph	-Infinity	Infinity	0.23	1.18.1.2
FRD5	[c] : mqn7 + succ <==> fum + mql7	-Infinity	Infinity	-0.02	1.3.5.1
FRHD	(2) fdox[c] + h2[e] <==> (2) fdred[c] + (2) h[e]	-Infinity	Infinity	10	1.12.7
FRTT	[c] : frdp + ipdp --> ggdp + ppi	0	Infinity	0.00	2.5.1.29
FTHFD	[c] : 10fthf + h2o --> for + h + thf	0	Infinity	0.00	3.5.1.10
FTHFLr	[c] : atp + for + thf <==> 10fthf + adp + pi	-Infinity	Infinity	0.00	6.3.4.3
FUM	[c] : fum + h2o <==> mal-L	-Infinity	Infinity	0.00	4.2.1.2
G1PACT	[c] : accoa + gam1p --> acgam1p + coa + h	0	Infinity	0.00	2.3.1.157
G1PTMT	[c] : dttp + g1p + h --> dtdpglc + ppi	0	Infinity	0.00	2.7.7.24
G3PD1	[c] : glyc3p + nad <==> dhap + h + nadh	-Infinity	Infinity	0.04	1.1.1.94
G3PD2	[c] : glyc3p + nadp <==> dhap + h + nadph	-Infinity	Infinity	-0.04	1.1.1.94
G5SADs	[c] : glu5sa <==> 1pyr5c + h + h2o	-Infinity	Infinity	0.00	
G5SD	[c] : glu5p + h + nadph --> glu5sa + nadp + pi	0	Infinity	0.00	1.2.1.41
GALU	[c] : g1p + h + utp <==> ppi + udpg	-Infinity	Infinity	0.00	2.7.7.9
GAPD	[c] : g3p + nad + pi <==> 13dpg + h + nadh	-Infinity	Infinity	-0.03	1.2.1.12
GARFT	[c] : 10fthf + gar <==> fgam + h + thf	-Infinity	Infinity	0.00	2.1.2.2
GCCc	[c] : dhlpro + nad --> h + lpro + nadh	0	Infinity	0.00	1.8.1.4
GF6PTA	[c] : f6p + gln-L --> gam6p + glu-L	0	Infinity	0.00	2.6.1.16
GGTT	[c] : ggdp + ipdp --> pendp + ppi	0	Infinity	0.00	
GHMT	[c] : ser-L + thf <==> gly + h2o + mlthf	-Infinity	Infinity	0.01	2.1.2.1
GK1	[c] : atp + gmp <==> adp + gdp	-Infinity	Infinity	0.00	2.7.4.8
GLCS1	[c] : adpglc --> adp + glycogen + h	0	Infinity	0.00	2.4.1.21
GLGC	[c] : atp + g1p + h --> adpglc + ppi	0	Infinity	0.00	2.7.7.27
GLNabc	atp[c] + gln-L[e] + h2o[c] --> adp[c] + gln-L[c] + h[c] + pi[c]	0	Infinity	0.00	
GLNS	[c] : atp + glu-L + nh4 --> adp + gln-L + h + pi	0	Infinity	0.12	6.3.1.2
GLNTRS	[c] : atp + gln-L + trnagln --> amp + glntrna + ppi	0	Infinity	0.00	6.1.1.18
GLU5K	[c] : atp + glu-L --> adp + glu5p	0	Infinity	0.00	2.7.2.11
GLUADT	[c] : atp + gln-L + glutrna + h2o --> adp + glntrna + glu-L + h + pi	0	Infinity	0.00	
GLUPRT	[c] : gln-L + h2o + prpp --> glu-L + ppi + pram	0	Infinity	0.00	2.4.2.14
GLUSx	[c] : akg + gln-L + h + nadh --> (2) glu-L + nad	0	Infinity	0.00	1.4.1.14
GLUSy	[c] : akg + gln-L + h + nadph --> (2) glu-L + nadp	0	Infinity	0.10	1.4.1.13
GLUTRS	[c] : atp + glu-L + trnaglu --> amp + glutrna + ppi	0	Infinity	0.00	6.1.1.17
GLYBt6	glyb[e] + h[e] <==> glyb[c] + h[c]	-Infinity	Infinity	0.00	
GLYOX	[c] : h2o + lgt-S --> gthrd + h + lac-D	0	Infinity	0.00	3.1.2.6
GLYTRS	[c] : atp + gly + trnagly --> amp + glytrna + ppi	0	Infinity	0.00	6.1.1.14
GMPR	[c] : gmp + (2) h + nadph --> imp + nadp + nh4	0	Infinity	0.00	1.7.1.7
GMPS2	[c] : atp + gln-L + h2o + xmp --> amp + glu-L + gmp + (2) h + ppi	0	Infinity	0.00	6.3.5.2

Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
GRTT	[c] : grdp + ipdp --> frdp + ppi	0	Infinity	0.00	2.5.1.10
GTPCI	[c] : gtp + h2o --> ahdt + for + h	0	Infinity	0.00	3.5.4.16
GTPCII	[c] : gtp + (3) h2o --> 25dhpp + for + (2) h + ppi	0	Infinity	0.00	3.5.4.25
GTPDK	[c] : atp + gtp --> amp + gdptp + h	0	Infinity	0.00	2.7.6.5
GUAPRT	[c] : gua + prpp --> gmp + ppi	0	Infinity	0.00	
H2Ot5	h2o[e] <==> h2o[c]	-Infinity	Infinity	-0.51	
H2td	h2[c] <==> h2[e]	-Infinity	Infinity	0.00	
HBUHL1	[c] : 3hbACP --> 2beACP + h2o	0	Infinity	0.00	4.2.1.58
HBUR1	[c] : actACP + h + nadph --> 3hbACP + nadp	0	Infinity	0.00	1.1.1.100
HCITS	[c] : accoa + akp + h2o --> coa + h + hcit	0	Infinity	0.00	4.1.3.21
HCO3E	[c] : co2 + h2o <==> h + hco3	-Infinity	Infinity	0.07	4.2.1.1
HDDHL5	[c] : 3hddACP --> 2tdACP + h2o	0	Infinity	0.00	4.2.1.58
HDDR5	[c] : 3oxddACP + h + nadph --> 3hddACP + nadp	0	Infinity	0.00	1.1.1.100
HDEHL4	[c] : 3hdeACP --> 2tdeACP + h2o	0	Infinity	0.00	4.2.1.58
HDER4	[c] : 3oxdeACP + h + nadph --> 3hdeACP + nadp	0	Infinity	0.00	1.1.1.100
HDMAT7	[c] : nad + palmACP <==> h + hdeACP + nadh	-Infinity	Infinity	0.00	1.3.1.10
HEMAT2	[c] : 2theACP + h + nadh --> hexACP + nad	0	Infinity	0.00	1.3.1.10
HEPTT	[c] : hepdp + ipdp --> octdp + ppi	0	Infinity	0.00	
HEX1	[c] : atp + glc-D --> adp + g6p + h	0	Infinity	0.00	2.7.1.2
HEXTT	[c] : hexdp + ipdp --> hepdp + ppi	0	Infinity	0.00	2.5.1.30
HGR	[c] : hg2 + nadph <==> h + hg0 + nadp	-Infinity	Infinity	0.00	1.16.1.1
HHDDL7	[c] : 3hpaACP --> h2o + hdeACP	0	Infinity	0.00	4.2.1.58
HHDR7	[c] : 3oxhdACP + h + nadph --> 3hpaACP + nadp	0	Infinity	0.00	1.1.1.100
HHYHL2	[c] : 3hhACP --> 2theACP + h2o	0	Infinity	0.00	4.2.1.58
HHYR2	[c] : 3oxhACP + h + nadph --> 3hhACP + nadp	0	Infinity	0.00	1.1.1.100
HICHL9	[c] : 3hicsacp --> 2ticsacp + h2o	0	Infinity	0.00	4.2.1.58
HICR9	[c] : 3oxicsacp + h + nadph --> 3hicsacp + nadp	0	Infinity	0.00	1.1.1.100
HISTD	[c] : h2o + histd + (2) nad --> (3) h + his-L + (2) nadh	0	Infinity	0.00	1.1.1.23
HISTP	[c] : h2o + hisp --> histd + pi	0	Infinity	0.00	3.1.3.15
HISTR5	[c] : atp + his-L + trnahis --> amp + histrna + ppi	0	Infinity	0.00	6.1.1.21
HMPK1	[c] : 4ahmmp + atp --> 4ampm + adp + h	0	Infinity	0.00	2.7.1.49
HMPK2	[c] : 4ahmmp + ctp --> 4ampm + cdp + h	0	Infinity	0.00	2.7.1.49
HMPK3	[c] : 4ahmmp + utp --> 4ampm + h + udp	0	Infinity	0.00	2.7.1.49
HMPK4	[c] : 4ahmmp + gtp --> 4ampm + gdp + h	0	Infinity	0.00	2.7.1.49
HOCHL3	[c] : 3hocACP --> 2toceACP + h2o	0	Infinity	0.00	4.2.1.58
HOCHR3	[c] : 3oxocACP + h + nadph --> 3hocACP + nadp	0	Infinity	0.00	1.1.1.100
HODHL8n	[c] : 3hocdACP --> 2tocdACP + h2o	0	Infinity	0.00	4.2.1.58
HODR8_#1	[c] : 3oxocdACP + h + nadph --> 3hocdACP + nadp	0	Infinity	0.00	1.1.1.100
HPPK	[c] : 2ahhmp + atp --> 2ahhmd + amp + h	0	Infinity	0.00	2.7.6.3

Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
HSAT	[c] : accoa + hom-L <==> achms + coa	-Infinity	Infinity	0.00	2.3.1.31
HSDy	[c] : hom-L + nadp <==> aspsa + h + nadph	-Infinity	Infinity	-0.01	1.1.1.3
HSK	[c] : atp + hom-L --> adp + h + phom	0	Infinity	0.00	2.7.1.39
HSPMS	[c] : (2) ptrc --> hspmd + nh4	0	Infinity	0.00	2.5.1.44
HSTPT	[c] : glu-L + imacp --> agk + h + hisp	0	Infinity	0.00	2.6.1.9
HTDHL6	[c] : 3htdACP --> h2o + tdeACP	0	Infinity	0.00	4.2.1.58
HTDR6	[c] : 3oxtdACP + h + nadph --> 3htdACP + nadp	0	Infinity	0.00	1.1.1.100
HXPRT	[c] : hxan + prpp --> imp + ppi	0	Infinity	0.00	2.4.2.8
ICDHy	[c] : icit + nadp <==> agk + co2 + nadph	-Infinity	Infinity	0.00	1.1.1.42
ICSMAT9	[c] : 2ticsacp + h + nadh --> icsACP + nad	0	Infinity	0.00	1.3.1.10
IG3PS	[c] : gln-L + prlp --> aicar + eig3p + glu-L + (2) h	0	Infinity	0.00	
IGPDH	[c] : eig3p + h --> h2o + imacp	0	Infinity	0.00	4.2.1.19
IGPS	[c] : 2cpr5p + h --> 3ig3p + co2 + h2o	0	Infinity	0.00	4.1.1.48
ILEabc	atp[c] + h2o[c] + ile-L[e] --> adp[c] + h[c] + ile-L[c] + pi[c]	0	Infinity	0.00	
ILETA	[c] : agk + ile-L <==> 3mop + glu-L	-Infinity	Infinity	0.00	2.6.1.42
ILETRS	[c] : atp + ile-L + trnaile --> amp + iletrna + ppi	0	Infinity	0.00	6.1.1.5
IMPcir	[c] : fprica --> h2o + imp	0	Infinity	0.01	3.5.4.10
IMPD	[c] : h2o + imp + nad --> h + nadh + xmp	0	Infinity	0.00	1.1.1.205
IOR	[c] : coa + (2) fdox + indpyr <==> co2 + (2) fdred + h + indaccoa	-Infinity	Infinity	0.00	
IOR2	[c] : coa + (2) fdox + phpyr <==> co2 + (2) fdred + h + phaccoa	-Infinity	Infinity	0.00	
IOR3	[c] : 34hpp + coa + (2) fdox <==> 4hphaccoa + co2 + (2) fdred + h	-Infinity	Infinity	0.00	
IPDPS	[c] : h + h2mb4p + nadh --> h2o + ipdp + nad	0	Infinity	0.00	
IPMD	[c] : 3c2hmp + nad --> 3c4mop + h + nadh	0	Infinity	0.01	1.1.1.85
IPMDH	[c] : de3mlt + nad <==> 2obut + co2 + (2) h + nadh	-Infinity	Infinity	0.00	
IPMI1	[c] : citmal <==> ccnt + h2o	-Infinity	Infinity	0.00	4.2.1.35
IPMI2	[c] : ccnt + h2o <==> de3mlt	-Infinity	Infinity	0.00	
IPPMla	[c] : 3c2hmp <==> 2ippm + h2o	-Infinity	Infinity	-0.01	4.2.1.33
IPPMlb	[c] : 2ippm + h2o <==> 3c3hmp	-Infinity	Infinity	-0.01	
IPPS	[c] : 3mob + accoa + h2o --> 3c3hmp + coa + h	0	Infinity	0.01	4.1.3.12
ITPASE	[c] : ditp + h2o --> dimp + ppi	0	Infinity	0.00	
KARA1	[c] : 23dhmb + nadp <==> alac-S + h + nadph	-Infinity	Infinity	-0.01	1.1.1.86
KARA2	[c] : 2ahbut + h + nadph <==> 23dhmp + nadp	-Infinity	Infinity	0.00	1.1.1.86
KAS11	[c] : (17) h + ivcoa + (6) malcoa + (12) nadph --> (6) co2 + (7) coa + fa11 + (5) h2o + (12) nadp	0	Infinity	0.00	2.3.1.41
KAS17	[c] : accoa + (22) h + (8) malcoa + (15) nadph --> (8) co2 + (9) coa + (7) h2o + (15) nadp + ocdcea	0	Infinity	0.00	2.3.1.41

Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
Kt6	$h[e] + k[e] \rightleftharpoons h[c] + k[c]$	-Infinity	Infinity	0.00	
LDH_L	$[c] : lac-L + nad \rightleftharpoons h + nadh + pyr$	-Infinity	Infinity	0.00	1.1.1.27
LEUabc	$atp[c] + h2o[c] + leu-L[e] \rightarrow adp[c] + h[c] + leu-L[c] + pi[c]$	0	Infinity	0.00	
LEUTA	$[c] : akG + leu-L \rightleftharpoons 4mop + glu-L$	-Infinity	Infinity	-0.01	2.6.1.42
LEUTRS	$[c] : atp + leu-L + trnaleu \rightarrow amp + leutrna + ppi$	0	Infinity	0.00	6.1.1.4
LPADSS	$[c] : lipidX + u23ga \rightarrow h + lipidAds + udp$	0	Infinity	0.00	2.4.1.182
LYSAM	$[c] : lys-L \rightleftharpoons 36dahx$	-Infinity	Infinity	0.00	5.4.3.2
LYSTRS	$[c] : atp + lys-L + trnalsy \rightarrow amp + lystrna + ppi$	0	Infinity	0.00	6.1.1.6
MACPMT	$[c] : ACP + malcoa \rightarrow coa + malACP$	0	Infinity	0.01	2.3.1.39
MAN1PT1	$[c] : gtp + h + man1p \rightarrow gdpman + ppi$	0	Infinity	0.00	2.7.7.13
MAN1PT2	$[c] : gdp + h + man1p \rightarrow gdpman + pi$	0	Infinity	0.00	2.7.7.22
MAN6PI	$[c] : man6p \rightleftharpoons f6p$	-Infinity	Infinity	0.00	5.3.1.8
MCMAT2	$[c] : butACP + h + malACP \rightarrow 3oxhACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT3	$[c] : h + hexACP + malACP \rightarrow 3oxocACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT4	$[c] : h + malACP + octACP \rightarrow 3oxdeACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT5	$[c] : decACP + h + malACP \rightarrow 3oxddACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT6	$[c] : ddcaACP + h + malACP \rightarrow 3oxtdACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT7	$[c] : h + malACP + myrsACP \rightarrow 3oxhdACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT8	$[c] : h + malACP + palmACP \rightarrow 3oxocdACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MCMAT9	$[c] : h + malACP + ocdACP \rightarrow 3oxicsACP + ACP + co2$	0	Infinity	0.00	2.3.1.41
MDH	$[c] : mal-L + nad \rightleftharpoons h + nadh + oaa$	-Infinity	Infinity	0.00	1.1.1.37
MECDPDH	$[c] : 2mecdp + nadh \rightarrow h2mb4p + h2o + nad$	0	Infinity	0.00	
MECDPS	$[c] : 2p4c2me \rightarrow 2mecdp + cmp$	0	Infinity	0.00	
MEPCT	$[c] : 2me4p + ctp + h \rightarrow 4c2me + ppi$	0	Infinity	0.00	
METACH	$[c] : achms + h2s \rightleftharpoons ac + hcys-L$	-Infinity	Infinity	0.00	4.2.99.10
METAT	$[c] : atp + h2o + met-L \rightarrow amet + pi + ppi$	0	Infinity	0.00	2.5.1.6
METS	$[c] : 5mthf + hcys-L \rightarrow h + met-L + thf$	0	Infinity	0.00	2.1.1.13
METSR-S1	$[c] : metox + trdrd \rightarrow h2o + met-L + trdox$	0	Infinity	0.00	
METSR-S2	$[c] : h2o2 + met-L \rightarrow h2o + metox$	0	Infinity	0.00	
METTRS	$[c] : atp + met-L + trnamet \rightarrow amp + mettrna + ppi$	0	Infinity	0.00	6.1.1.10
MGSA	$[c] : dhap \rightarrow mthgl + pi$	0	Infinity	0.00	4.2.3.3



Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
MGt5	$mg2[c] \rightleftharpoons mg2[e]$	-Infinity	Infinity	0.00	
MICITH	$[c] : 2mcacn + h2o \rightarrow micit$	0	Infinity	0.00	4.2.1.99
MNabc	$atp[c] + h2o[c] + mn2[e] \rightarrow adp[c] + h[c] + mn2[c] + pi[c]$	0	Infinity	0.00	
MOBDabc	$atp[c] + h2o[c] + mobd[e] \rightarrow adp[c] + h[c] + mobd[c] + pi[c]$	0	Infinity	0.00	
MOHMT	$[c] : 3mob + h2o + mlthf \rightarrow 2dhp + thf$	0	Infinity	0.00	2.1.2.11
MPGSP	$[c] : 3pg + gdpman + (2) h \rightleftharpoons 2m3pg + gdp$	-Infinity	Infinity	0.00	2.4.1.217
MTAP	$[c] : 5mta + pi \rightarrow 5mdr1p + ade$	0	Infinity	0.00	2.4.2.28
MTHFC	$[c] : h2o + methf \rightleftharpoons 10fthf + h$	-Infinity	Infinity	0.01	3.5.4.9
MTHFD	$[c] : mlthf + nadp \rightleftharpoons methf + nadph$	-Infinity	Infinity	0.01	1.5.1.5
MTHFR1	$[c] : (2) h + mlthf + nadph \rightarrow 5mthf + nadp$	0	Infinity	0.00	1.7.99.5
MTRI	$[c] : 5mdr1p \rightleftharpoons 5mdru1p$	-Infinity	Infinity	0.00	5.3.1.23
N2t	$n2[c] \rightleftharpoons n2[e]$	-Infinity	Infinity	0.00	
NADH4	$[c] : h + mqn7 + nadh \rightarrow mql7 + nad$	0	Infinity	0.02	1.6.5.3
NADH6	$(4.5) h[c] + nadh[c] + ubq8[c] \rightarrow (3.5) h[e] + nad[c] + ubq8h2[c]$	0	Infinity	0.00	1.6.5.3
NADH7	$(3) h[c] + mqn8[c] + nadh[c] \rightarrow (2) h[e] + mql8[c] + nad[c]$	0	Infinity	0.00	1.6.5.3
NADH8	$2dmmq8[c] + (3.8) h[c] + nadh[c] \rightarrow 2dmmql8[c] + (2.8) h[e] + nad[c]$	0	Infinity	0.00	1.6.5.3
NADK	$[c] : atp + nad \rightarrow adp + h + nadp$	0	Infinity	0.00	2.7.1.23
NADPH12	$[c] : h + nadph + ubq8 \rightarrow nadp + ubq8h2$	0	Infinity	0.00	1.6.5.5
NADS1	$[c] : atp + dnad + nh4 \rightarrow amp + h + nad + ppi$	0	Infinity	0.00	6.3.1.5
NADS2	$[c] : atp + dnad + gln-L + h2o \rightarrow amp + glu-L + h + nad + ppi$	0	Infinity	0.00	6.3.5.1
NAMNPP	$[c] : atp + h2o + nac + prpp \rightarrow adp + nicrnt + pi + ppi$	0	Infinity	0.00	
NCTPPRT	$[c] : nicrnt + ppi \rightleftharpoons h + nac + prpp$	-Infinity	Infinity	0.00	2.4.2.11
NDPK1	$[c] : atp + gdp \rightleftharpoons adp + gtp$	-Infinity	Infinity	0.01	2.7.4.6
NDPK2	$[c] : atp + udp \rightleftharpoons adp + utp$	-Infinity	Infinity	0.01	2.7.4.6
NDPK3	$[c] : atp + cdp \rightleftharpoons adp + ctp$	-Infinity	Infinity	0.00	2.7.4.6
NDPK4	$[c] : atp + dtdp \rightleftharpoons adp + dttp$	-Infinity	Infinity	0.00	2.7.4.6
NDPK5	$[c] : atp + dgdg \rightleftharpoons adp + dgtp$	-Infinity	Infinity	0.00	2.7.4.6
NDPK6	$[c] : atp + dudp \rightleftharpoons adp + dutp$	-Infinity	Infinity	0.00	2.7.4.6
NDPK7	$[c] : atp + dcdp \rightleftharpoons adp + dctp$	-Infinity	Infinity	0.00	2.7.4.6
NDPK8	$[c] : atp + dadp \rightleftharpoons adp + datp$	-Infinity	Infinity	0.00	2.7.4.6
NH4t	$nh4[e] \rightleftharpoons nh4[c]$	-Infinity	Infinity	0.15	
NH4t3	$k[c] + nh4[e] \rightarrow k[e] + nh4[c]$	0	Infinity	0.00	

Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
Nlabc	$\text{atp}[c] + \text{h2o}[c] + \text{ni2}[e] \rightarrow \text{adp}[c] + \text{h}[c] + \text{ni2}[c] + \text{pi}[c]$	0	Infinity	0.00	
NITr	$[\text{c}] : (16) \text{atp} + (8) \text{fdred} + (16) \text{h2o} + \text{n2} \rightleftharpoons (16) \text{adp} + (8) \text{fdox} + (6) \text{h} + \text{h2} + (2) \text{nh4} + (16) \text{pi}$	-Infinity	Infinity	0.00	1.18.6.1
NMNATr	$[\text{c}] : \text{atp} + \text{h} + \text{nmn} \rightleftharpoons \text{nad} + \text{ppi}$	-Infinity	Infinity	0.00	2.7.7.1
NNATr	$[\text{c}] : \text{atp} + \text{h} + \text{nicrnt} \rightleftharpoons \text{dnad} + \text{ppi}$	-Infinity	Infinity	0.00	2.7.7.18
NNDMBRT	$[\text{c}] : \text{dmbzid} + \text{nicrnt} \rightarrow 5\text{prdmzb} + \text{h} + \text{nac}$	0	Infinity	0.00	2.4.2.21
NNDMBRT3	$[\text{c}] : \text{ribflv} \rightarrow \text{dmbzid}$	0	Infinity	0.00	
NNDPR	$[\text{c}] : (2) \text{h} + \text{prpp} + \text{quln} \rightarrow \text{co2} + \text{nicrnt} + \text{ppi}$	0	Infinity	0.00	2.4.2.19
NTPP1	$[\text{c}] : \text{dgtp} + \text{h2o} \rightarrow \text{dgmp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP2	$[\text{c}] : \text{gtp} + \text{h2o} \rightarrow \text{gmp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP3	$[\text{c}] : \text{dctp} + \text{h2o} \rightarrow \text{dcmp} + \text{h} + \text{ppi}$	0	Infinity	0.00	3.6.1.12
NTPP4	$[\text{c}] : \text{ctp} + \text{h2o} \rightarrow \text{cmp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP5	$[\text{c}] : \text{datp} + \text{h2o} \rightarrow \text{damp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP6	$[\text{c}] : \text{atp} + \text{h2o} \rightarrow \text{amp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP7	$[\text{c}] : \text{dttp} + \text{h2o} \rightarrow \text{dtmp} + \text{h} + \text{ppi}$	0	Infinity	0.00	
NTPP8	$[\text{c}] : \text{h2o} + \text{utp} \rightarrow \text{h} + \text{ppi} + \text{ump}$	0	Infinity	0.00	
NTPTP2	$[\text{c}] : \text{gtp} + \text{h2o} \rightarrow \text{gsn} + \text{pppi}$	0	Infinity	0.00	3.1.5.1
NTRIRx	$[\text{c}] : (4) \text{h} + (3) \text{nadh} + \text{no2} \rightarrow \text{h2o} + (3) \text{nad} + \text{nh4oh}$	0	Infinity	0.00	1.7.1.4
NTRIRy	$[\text{c}] : (4) \text{h} + (3) \text{nadph} + \text{no2} \rightarrow \text{h2o} + (3) \text{nadp} + \text{nh4oh}$	0	Infinity	0.00	1.7.1.4
OBFL	$[\text{c}] : 2\text{obut} + \text{coa} \rightarrow \text{for} + \text{ppcoa}$	0	Infinity	0.00	
OCBT	$[\text{c}] : \text{cbp} + \text{orn-L} \rightleftharpoons \text{citr-L} + \text{h} + \text{pi}$	-Infinity	Infinity	0.00	2.1.3.3
OCDMAT8	$[\text{c}] : 2\text{tocdACP} + \text{h} + \text{nadh} \rightarrow \text{nad} + \text{ocdACP}$	0	Infinity	0.00	1.3.1.10
OCMAT3	$[\text{c}] : 2\text{toceACP} + \text{h} + \text{nadh} \rightarrow \text{nad} + \text{octACP}$	0	Infinity	0.00	1.3.1.10
OCTT	$[\text{c}] : \text{ipdp} + \text{octdp} \rightarrow \text{nondp} + \text{ppi}$	0	Infinity	0.00	2.5.1.11
OHPHM	$[\text{c}] : 2\text{ohph} + \text{amet} \rightarrow 2\text{omph} + \text{ahcys} + \text{h}$	0	Infinity	0.00	
OIVD1	$[\text{c}] : 4\text{mop} + \text{coa} + \text{nad} \rightleftharpoons \text{co2} + \text{ivcoa} + \text{nadh}$	-Infinity	Infinity	0.00	1.2.1.25
OIVD2	$[\text{c}] : 3\text{mob} + \text{coa} + \text{nad} \rightarrow \text{co2} + \text{ibcoa} + \text{nadh}$	0	Infinity	0.00	1.2.1.25
OIVD3	$[\text{c}] : 3\text{mop} + \text{coa} + \text{nad} \rightarrow 2\text{mbcoa} + \text{co2} + \text{nadh}$	0	Infinity	0.00	1.2.1.25
OMBZLM	$[\text{c}] : 2\text{ombzl} + \text{amet} \rightarrow 2\text{ommb} + \text{ahcys} + \text{h}$	0	Infinity	0.00	
OMCDC	$[\text{c}] : 3\text{c4mop} + \text{h} \rightarrow 4\text{mop} + \text{co2}$	0	Infinity	0.01	
OMPDC	$[\text{c}] : \text{h} + \text{orot5p} \rightarrow \text{co2} + \text{ump}$	0	Infinity	0.01	4.1.1.23
OOR2r	$[\text{c}] : \text{akg} + \text{coa} + (2) \text{fdox} \rightleftharpoons \text{co2} + (2) \text{fdred} + \text{h} + \text{succoa}$	-Infinity	Infinity	-0.02	1.2.7.3
ORNCD	$[\text{c}] : \text{orn-L} \rightarrow \text{nh4} + \text{pro-L}$	0	Infinity	0.00	4.3.1.12
ORNDC	$[\text{c}] : \text{h} + \text{orn-L} \rightarrow \text{co2} + \text{ptrc}$	0	Infinity	0.00	4.1.1.17
ORNTA	$[\text{c}] : \text{akg} + \text{orn-L} \rightarrow \text{glu-L} + \text{glu5sa}$	0	Infinity	0.00	2.6.1.13









Abbreviation	Equation	LB	UB	Flux (mmol/gDCW/h)	EC Number
EX_etl(e)	[e] : etl <==>	0	Infinity	0.00	
EX_fe2(e)	[e] : fe2 <==>	0	0	0.00	
EX_gln-L(e)	[e] : gln-L <==>	0	0	0.00	
EX_glyb(e)	[e] : glyb <==>	0	0	0.00	
EX_h(e)	[e] : h <==>	-Infinity	Infinity	9.55	
EX_h2(e)	[e] : h2 <==>	-10	0	-10.00	
EX_h2o(e)	[e] : h2o <==>	-Infinity	Infinity	0.51	
EX_hcb(e)	[e] : hcb <==>	-Infinity	0	-2.40	
EX_ile-L(e)	[e] : ile-L <==>	0	0	0.00	
EX_k(e)	[e] : k <==>	0	0	0.00	
EX_leu-L(e)	[e] : leu-L <==>	0	0	0.00	
EX_mg2(e)	[e] : mg2 <==>	0	0	0.00	
EX_mn2(e)	[e] : mn2 <==>	0	0	0.00	
EX_mobd(e)	[e] : mobd <==>	0	0	0.00	
EX_n2(e)	[e] : n2 <==>	0	0	0.00	
EX_nh4(e)	[e] : nh4 <==>	-Infinity	Infinity	-0.15	
EX_ni2(e)	[e] : ni2 <==>	0	0	0.00	
EX_pce(e)	[e] : pce <==>	-Infinity	0	0.00	
EX_pi(e)	[e] : pi <==>	-Infinity	Infinity	-0.03	
EX_pro-L(e)	[e] : pro-L <==>	0	0	0.00	
EX_so4(e)	[e] : so4 <==>	-Infinity	Infinity	0.00	
EX_tsul(e)	[e] : tsul <==>	0	0	0.00	
EX_val-L(e)	[e] : val-L <==>	0	0	0.00	
EX_zn2(e)	[e] : zn2 <==>	0	0	0.00	