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| **Process** | **Gene** | **KO** | **notes** |
| Aerobic C fixation | ribulose-bisphosphate carboxylase large (*rbc*L) | K01601 | Calvin cycle |
| ribulose-bisphosphate carboxylase small (*rbc*S) | K01602 | Calvin cycle |
| phosphoribulose kinase (*prk*A) | K00855 | Calvin cycle |
| Respiration | cytochrome C oxidase subunit I (*cox*I) | K02256 | Eucaryotic |
| cytochrome C oxidase subunit III (*cox*III) | K02262 | Eucaryotic |
| cytochrome C oxidase subunit I (*cox*A) | K02274 | Bacterial |
| cytochrome C oxidase subunit III (*cox*C) | K02276 | Bacterial |
| Anaerobic C fixation | ATP-citrate lyase alpha subunit (*acl*A) | K15230 | Bacterial, rTCA |
| ATP-citrate lyase beta subunit (*acl*B) | K15231 | Bacterial, rTCA |
| citryl-CoA lyase (*ccl*) | K15234 | rTCA |
| citryl-CoA synthetase (*ccs*B) | K15233 | rTCA |
| fumerate reductase flavoprotein subunit (*frd*A) | K00244 | rTCA |
| carbon monoxide dehydrogenase/acetyl-CoA synthase alpha (CODH-ACSA) | K14138 | WL |
| carbon monoxide dehydrogenase/acetyl-CoA synthase beta (CODH-ACSA) | K00190 | WL |
| Fermentation | L-lactate dehydrogenase | K00016 |  |
| pyruvate:ferredoxin oxidoreductase alpha subunit | K00169 |  |
| pyruvate:ferredoxin oxidoreductase beta subunit | K00170 |  |
| CO oxidation | carbon-monoxide dehydrogenase large (*cox*L) | K03520 |  |
| carbon-monoxide dehydrogenase medium (*cox*M) | K03519 |  |
| carbon-monoxide dehydrogenase small (*cox*S) | K03518 |  |
| AAnP | photosynthetic reaction center L subunit (*puf*L) | K08928 |  |
| photosynthetic reaction center M subunit (*puf*M) | K08929 |  |
| Methanogenesis | coenzyme M methyl reductase (*mcr*B)  methyl coenzyme M reductase system | K00401  K00400 |  |
| CH4 oxidation | soluble methane monooxygenase | K08684 | now deprecated |
| N fixation | nitrogenase (*anf*G) | K00531 |  |
| nitrogenase molybdenum-iron protein alpha (*nif*D) | K02586 |  |
| nitrogenase iron protein (*nif*H) | K02588 |  |
| nitrogenase molybdenum-iron protein beta (*nif*K) | K02591 |  |
| Denitrification | nitric oxide reductase (*nor*B) | K02305 |  |
| nitric oxide reductase (*nor*C) | K04561 |  |
| nitrous oxide reductase (*nos*Z) | K00376 |  |
| DNRA | cytochrome c-552 (*nrf*A) | K03385 |  |
| Anammox | hydroxylamine oxidase (*hao*) | K10535 | related to *hzo* |
| N mineralization | glutamate dehydrogenase (*gud*B, *roc*G) | K00260 |  |
| glutamate dehydrogenase (*gdh*A) | K00261 |  |
| glutamate dehydrogenase (*gdh*A) | K00262 |  |
| N assimilation | assimilatory nitrate reductase | K00360 |  |
| ferredoxin-nitrate reductase (*nar*B) | K00361 |  |
| glutamine synthetase (*gln*A) | K01915 |  |
| glutamate synthetase (NADPH/NADH)(*glt*B) | K00265 |  |
| glutamate synthetase (ferredoxin) (*glt*S) | K00284 |  |
| Nitrification | ammonia monooxygenase subunit A (*amo*A) | K10944 |  |
| ammonia monooxygenase subunit B (*amo*B) | K10945 |  |
| ammonia monooxygenase subunit C (*amo*C) | K10946 |  |
| DSR | adenylylsulfate reductase subunit A (*apr*A) | K00394 | SRB related |
| adenylylsulfate reductase subunit B (*apr*B) | K00395 | SRB related |
| sulfite reductase (*dsr*A) | K11180 | SRB related |
| sulfite reductase (*dsr*B) | K11181 | SRB related |
| S oxidation | sulfite oxidase (SUOX) | K00387 |  |
| ASR | Adenyl sulfate kinase (*cys*C) | K00860 |  |
| Sulfate adenylyltransferase (*cys*N) | K00956 |  |
| Sulfate adenylyltransferase (*cys*D) | K00957 |  |
| S mineralization | Cysteine diogenase (CDO1) | K00456 |  |
| thiosulfate/3-Mercaptopyruvate sulfurtransferase (TST, MPST, *sse*A) | K01011 |  |
| DMSO reduction | anaerobic dimethyl sulfoxide reductase subunit A (*dms*A) | K07306 |  |
| anerobic dimethylsulfoxide reductase | K00397 |  |