

Supplementary Table 1

Names and chromosomal locations of selected *Rhodopseudomonas palustris* genes.

Dehydrogenases (electron donating enzymes)

Carbon monoxide dehydrogenase (cosSML) (rpa4666-4668) 5,261,956 – 5,261,956

Carbon monoxide dehydrogenase (rpa3802 rpa3803) 4,299,460 – 4,300,827

Succinate dehydrogenase (rpa0216 - 0219) 241,162- 244,289:

Formate dehydrogenase fdsG, fdsB, fdsA, fdsC, fdsD (rpa0732-rpa0736) 806,161-812,078.

Ethanol dehydrogenase (quino heme protein) (rpa 3188) 3,599,316-3,601,490

Hydrogenase (hup/hyp genes) (rpa0959-rpa0978) 1,061, 498- 1,078,784.

NADH dehydrogenase (nuoN-nuoA) (rpa2937-2952) 3,321,506 – 3,337,341

NADH dehydrogenase (nuoN-nuoA) (rpa4252-4264) 4,796,479-4,810,793.

Thiosulfate oxidase rpa2937-rpa2952 (5,032,374-5,046,412).

Oxidases (electron accepting enzymes)

Cytochrome bd ubiquinol-oxidase (rpa1318 and rpa1319) 1,436,855-1,438,581

Cytochrome cbb₃ oxidase (high affinity for oxygen) fixHGPN) Very (rpa0014-rpa0019) 16,925-22,475.

Cytochrome aa₃ oxidase (coxABCEFG) (rpa0831-rpa0837) 926,324 – 931,631

Quinol oxidase (qxtAB) (rpa4793-rpa4794) 5,411,181-5,413,611.

Nitric oxide reductase (nor genes) (rpa1453-rpa1458) 1,612,792-1,618,525.

Nitrous oxide reductase.(noz genes) (rpa2060-rpa2066) 2,320,449-2,329,324.

Nitrite reductase (nirK) (rpa3306) 3,727,317-3,728,423.

Nitrite reductase (nirK) (rpa4145) 4,686,505-4,687,617

Photophosphorylation

Photosynthesis (reaction center genes and associated carotenoid and bacteriochlorophyll biosynthesis)(rpa1505-1554) 1,671,137-1,725,322.

- Light harvesting *pucAa* and *pucBa* (rpa2653 and 2654) (3,017,745-3,018,093)
- Light harvesting *pucBc* (rpa3009) next to rpa3010 (pseudo-light harvesting). (3,408,431-3,408,586)
- Light harvesting *pucAd* and *pucBd* (rpa3012 and rpa3013) .(3,410,110-3,410,457)
- Light harvesting genes *pucBb* and *pucAb* (rpa4291-4292) (4838558-4838926).
- Light harvesting *pucBe* and *pucAe* (rpa1491-1492) (1,655,417-1,655,764)

Carbon dioxide fixation

Type I RubisCo : (cbbS) (rpa1559-rpa1560) 1,731,700-1,733,593.

Type II RubisCo (cbbM) (rpa4641) 5224192-5225577.

Biodegradation of aromatic compounds and fatty acids.

Anaerobic benzoate and 4-hydroxybenzoate degradation (bad and hba genes) (rpa0650-0673) 717848-744056.

Protocatechuate degradation (meta cleavage) (rpa4695- rpa4703) 5298468-5306919.

Medium chain fatty acid and dicarboxylic acid degradation. (Rpa3712 –3717) 4191624-4192413.

Phenylacetate degradation (CoA mediated). (rpa1723 and 1724) 1,922,593 and (rpa3765-3768) 4261763-4264596.

Homoprotocatechuate degradation (rpa3755-rpa3762) (4251014-4258821)

Homogentisate degradation. (rpa4670-rpa4675) 5267227-5274135.

Nitrogen fixation and acquisition.

Vanadium nitrogenase (rpa1370-1380) (1,515,576- 1,527,905).

Iron nitrogenase (rpa1435-1439) (1,590,406-1,596,854).

Molybdenum nitrogenase: (rpa4602-4633) (5,188,040- 5,215,364)

- Glutamine synthetase. glnA4 (rpa0984) (1,086,639-1,088,099)
- Glutamine synthetase glnA (rpa2967) (3,360,870-3,362,297)
- Glutamine synthetase glnAII (rpa4209) (4,752,301-4,753,338)
- Glutamine synthetase gln AIII (rpa1401) (1,547,728-1,549,113)