

P036 Nitrate reductases from *Paracoccus denitrificans* and *Enterobacter cloacae*; different activities towards nitrate and selenate

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Enterobacter cloacae SLD1a-1 reduces selenium oxyanions both aerobically and anaerobically. Activity assays and non-denaturing native PAGE have demonstrated that both separate selenate and nitrate reductases are present. The purified nitrate reductase is of the NAR type (NarG~150 kDa and NarH~60 kDa) and displays no selenate reductase activity. The translated amino acid sequence of the NarG component has high sequence similarity with the nitrate reductase α subunit from *Escherichia coli*. Purified periplasmic (NAP) and membrane bound (NAR) nitrate reductases from *Paracoccus denitrificans* both show a low level of selenate reductase activity. *P. denitrificans* is unable to grow under anaerobic conditions in the presence of both nitrate and selenate (10mM), whereas *E. cloacae* growth is supported. Neither organism however is capable of growth anaerobically with selenate in the absence of nitrate, which suggests that selenate is not used as the sole terminal electron acceptor. *E. cloacae* seems to have evolved an enzyme solely for the detoxification of selenate, whereas in *P. denitrificans* selenate reduction appears to be a secondary activity of the nitrate reductase.