

## Characterisation of respiratory chain supercomplexes of *Paracoccus denitrificans*

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*Paracoccus denitrificans* is a Gram-negative soil bacterium, that contains NADH-ubiquinone-oxidoreductase, cytochrome *bc*<sub>1</sub> complex and cytochrome *c* oxidase, as well as further respiratory chain enzymes like succinate dehydrogenase and different terminal oxidases [1]. Complex I of *Paracoccus denitrificans* is a detergent-sensitive enzyme, that could not be isolated so far using the detergent laurylmaltoside. Complexes III and IV were purified by Berry and Trumpower [2] as assemblies of the two complexes with variable.

We found that digitonin is a milder detergent and isolated supercomplexes containing monomeric complex I, tetrameric complex III and four copies of complex IV. Complex IV probably exists as two complex IV dimers since we could find smaller supercomplexes containing tetrameric complex III with two or four copies of complex IV, which seem to be dissociation products of the large supercomplex.

The supercomplexes from *Paracoccus denitrificans* are structurally similar to those of mammalian mitochondria as described by Schägger and Pfeiffer [3], although the stoichiometry of the individual complexes is different.

In contrast to mammalian supercomplexes the supercomplexes from *Paracoccus denitrificans* seems to represent a complete respirasome with stably bound cytochrome *c* oxidase.

[1] Baker S.C., Ludwig B. *et al.* (1998) Molecular genetics of the genus *Paracoccus*: metabolically versatile bacteria with bioenergetic flexibility. *Microbiol. & Mol. Biol. Reviews*, **62**, 1046-1078

[2] Berry E.A., Trumpower B.L. (1985) Isolation of ubiquinol oxidase from *Paracoccus denitrificans* and resolution into cytochrome *bc*<sub>1</sub> and cytochrome *c*-aa<sub>3</sub> complexes. *J. Biol. Chem.*, **260**, 2458-2467,

[3] Schägger H., Pfeiffer K., (2000) Supercomplexes in the respiratory chains of yeast and mammalian mitochondria. *Embo*, **19**, 1-7

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