Molecular cloning, sequencing, and expression of a chemoreceptor gene from Leptospirillum ferrooxidans

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We have cloned and sequenced a 2,262-bp chromosomal DNA fragment from the chemolithoautotrophic acidophilic bacterium Leptospirillum ferrooxidans. This DNA contained an open reading frame for a 577oaminoacid protein showing several characteristics of the bacterial chemoreceptors and, therefore, we named this gene lcrl for Leptospirillum chemotaxis receptor I. This is the first sequence reported for a gene from L. ferrooxidans encoding a protein. The lcrI gene showed both ?28-like and ?70-like putative promoters. The LcrI deduced protein contained two hydrophobic regions most likely corresponding to the two transmembrane regions present in all of the methyl- accepting chemotaxis proteins (MCPs) which make them fold with both periplasmic and cytoplasmic domains. We have proposed a cytoplasmic domain for LcrI, which also contains the highly conserved domain (HCD region), present in all of the chemotactic receptors, and two probable methylation sites. The in vitro expression of a DNA plasm