

Isolation and Nucleotide Sequence of the Thiobacillus Ferrooxidans Gene for the Small and Large Subunits of Ribulose 1,5 Bisphosphate Carboxylase/Oxygenase

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Abstract

The genes encoding for the large (rbcL) and small (rbcS) subunits of ribulose-1,5-bisphosphate carboxylase (RuBisCO) were cloned from the obligate autotroph *Thiobacillus ferrooxidans*, a bacterium involved in the bioleaching of minerals. Nucleotide sequence analysis of the cloned DNA showed that the two coding regions are separated by a 30-bp intergenic region, the smallest described for the RuBisCO genes. The rbcL and rbcS genes encode polypeptides of 473 and 118 amino acids, respectively. Comparison of the nucleotide and amino acid sequences with those of the genes for rbcL and rbcS found in other species demonstrated that the *T. ferrooxidans* genes have the closest degree of identity with those of *Chromatium vinosum* and of *Alviniconcha hessleri* endosymbiont. Both *T. ferrooxidans* enzyme subunits contain all the conserved amino acids that are known to participate in the catalytic process or in holoenzyme assembly.