L-Amino Acid Oxidases with Specificity for Basic L-Amino Acids in Cyanobacteria

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The two closely related fresh water cyanobacteria \textit{Synechococcus elongatus} PCC 6301 and \textit{Synechococcus elongatus} PCC 7942 have previously been shown to constitutively express a FAD-containing \textit{l}-amino acid oxidase with high specificity for basic \textit{l}-amino acids (\textit{l}-arginine being the best substrate). In this paper we show that such an enzyme is also present in the fresh water cyanobacterium \textit{Synechococcus cedrorum} PCC 6908. In addition, an improved evaluation of the nucleotide/amino acid sequence of the \textit{l}-amino acid oxidase of \textit{Synechococcus elongatus} PCC 6301 (encoded by the \textit{aoxA} gene) with respect to the FAD-binding site and a translocation pathway signal sequence will be given. Moreover, the genome sequences of 24 cyanobacteria will be evaluated for the occurrence of an \textit{aoxA}-similar gene. In the evaluated cyanobacteria 15 genes encoding an \textit{l}-amino acid oxidase-similar protein will be found.

\textit{Key words:} Cyanobacteria, \textit{l}-Amino Acid Oxidase, \textit{Synechococcus elongatus} PCC 6301 and PCC 7942