

## **A Delta4 Fatty Acid Desaturase from *Thraustochytrium aureum* Involved in the Biosynthesis of Docosahexanoic Acid by Heterologous Expression in *E. coli***

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*Thraustochytrium* is a unicellular marine eukaryotic microorganism and unusually produces long chain polyunsaturated fatty acids such as DHA and docosapentanoic acid (DPA) 22:5(n-6). DHA (docosahexanoic acid) is a fatty acid of the (n-3) series, and it is synthesized via alternating steps of desaturation and elongation. A delta4 fatty acid desaturase from *Thraustochytrium* sp. has been studied that introduced a double bond at the position of 22:5(7,10,13,16,19) and 22:4(7,10,13,16), resulting in the production of DHA and DPA, respectively. The function of delta4 fatty acid desaturase was identified as the enzyme which involved in the biosynthesis of docosahexanoic acid (DHA) by gas chromatography. In the present study, when the delta4 fatty acid desaturase from *Thraustochytrium aureum* was expressed in *E. coli*, the fatty acid composition was changed, resulting in the production of DHA and other long-chain unsaturated fatty acids. These results support the notion that DHA can be synthesized via delta4 fatty acid desaturase in *E. coli* and suggest the possibility that DHA can be produced on a large scale.

### **References**

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