

Two types of intramembrane proteins IP39 are present in the plasma membrane of *Euglena gracilis*

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SUMMARY

Flagellates of the genus *Euglena* perform a characteristic movement called euglenoid movement. The intramembrane proteins, called IP39, which are regularly and densely arranged in the plasma membrane of *Euglena gracilis*, have been implicated in this movement. In this study, we cloned two types of cDNAs that encode IP39, and predicted their amino acid sequences. Northern and western blot analysis confirmed that both cDNAs encode IP39. Consequently, we called these proteins α - and β -IP39, respectively. The α - and β -IP39 proteins consist of 264 and 265 amino acid residues, respectively. Differences between the predicted amino acid sequences were restricted to the C-terminal region, except for two residues in the middle part. The predicted amino acid sequences were analyzed using various programs (ALL IN ONE SEQ-ANALYZER, BLAST, SOSUI, The Predict Protein Server, MOTIF, NetOGlyc3.1, NetNGlyc1.0, ProtParam, NetPhos analysis, iPSORT and DISULFIND). The molecular weights of both IP39 were predicted to be 29-kDa, and both IP39 proteins were predicted to contain four transmembrane domains. A homology search of cDNA sequences showed that there was no significant sequence homology with any other known proteins. This result indicates that both types of IP39 are novel proteins that have not yet been reported. Additionally, both IP39 were similar to claudin, which is an approximately 23-kDa transmembrane protein found in the tight junction of mammalian cells.