

研究 POU 蛋白 IMB 於果蠅神經細胞的分布

Localization of the POU protein IMB in *Drosophila* neurons

中文摘要

果蠅的 Immobile (IMB) 蛋白含有兩個 DNA 結合區域，分別為 POU 特定的功能區和 homeobox 功能區。為了瞭解 IMB 座落的位置為何，我利用果蠅 GAL4/UAS 系統，在果蠅的神經細胞株 BG3-C2 中，表達全長或不同區域的 IMB 片段，而觀察其座落的位置。全長的 IMB 主要表達於細胞核內，但在細胞質和神經突也有分佈；當表達 IMB C 端兩個 DNA 結合區域時，其蛋白質片段的座落範圍只限於細胞核內；而表達 N 端未含 DNA 結合區域的 IMB 片段則會表現在細胞質及神經突裡。有趣地是，表達全長的 IMB 會呈現圓圈狀，中空甜甜圈狀的構造，散佈在細胞各處。更進一步，利用果蠅的中央腦區作為生物體模式表達含有全長或不同區域的 IMB，觀察其蛋白質的分布型態。全長的 IMB 及只含有 C 端的 IMB 片段主要座落於細胞核內，而表達 N 端未含 DNA 結合區域的 IMB 片段則會表現在細胞核及神經突裡。綜合在果蠅細胞株內和果蠅神經系統中過度表達的實驗結果，推測轉錄因子 IMB 可能在細胞質中扮演著一個未知的角色。

英文摘要

The *Drosophila* Immobile (IMB) protein is a putative transcription factor that contains two DNA binding domains, a POU-specific domain and a homeobox domain. To characterize the localization of IMB, the *Drosophila* GAL4/UAS system was used to express different truncated forms of IMB and expression patterns of IMB constructs were observed in the *Drosophila* neuronal cell line, BG3-C2. Full-length IMB was predominantly localized in nuclei but was also observed in the cytoplasm and neurites. While the IMB C-terminal fragment with the two DNA binding domains located in nuclei, the IMB N-terminus without the DNA binding domains had preference to localize in the cytoplasm and neurites. Interestingly, full-length IMB displayed circular, donut-like structures spreading in whole cells. Furthermore, *Drosophila* central brain was used as an *in vivo* system to examine the expression patterns of these truncated IMB proteins. While the full-length and the C-terminal fragment of IMB localized mainly in nuclei, the N-terminus of IMB could be located in nuclei as well as axonal termini. Taken together, based on ectopic expression in cell lines and in *Drosophila* nervous systems, it is assumed that the transcriptional factor IMB may play a novel role in the cytoplasm.