A10: Role of Eukaryotic Translation Elongation Factor 1A in Neuronal Differentiation

Y. Shigeeda, T. Akashi, T. Iyoda, F. Fukai*
Department of Molecular Patho-Physiology, Faculty of Pharmaceutical Sciences, Tokyo University of Science, Chiba, Japan

*Contact author: fukai@rs.noda.tus.ac.jp

Cell adhesion to the extracellular matrix (ECM) plays a crucial role in fundamental cellular processes, such as cell growth and differentiation. We previously found that the fibronectin-derived peptide FNIII14 inhibits cell adhesion to FN. More recently, we demonstrated that antiadhesive effect of FNIII14 is mediated by eukaryotic elongation factor 1A (eEF1A) on outer surface of plasma membrane [1].

Two protein isomers of eEF1A, 1A1 and 1A2, have a quite different tissue expression pattern: 1A1 is expressed in most cells and 1A2 in terminally differentiated cells including nerve and muscle cells. However, the distinct roles of these isomers with different tissue distribution are unclear. In this study, we investigated the role of eEF1A2 in neuronal differentiation.

Stimulation of PC12 cells with NGF induced morphological change to neuronal cells with neurite-like filopodium accompanied by an increase in the expression of eEF1A2 mRNA. In neuronal cells with a number of filopodium, a remarkable expression of neurofilament, a neuronal marker protein, was evident specifically in their neurite-like protrusions. When expression of eEF1A2 protein was reduced by the siRNA-based method, NGF-induced morphological change in PC12 cells was inhibited completely.

These results suggest that eEF1A2 may play an important role in the formation of axon-like protrusions during neuronal differentiation.

REFERENCE