

LOCAL PROTEIN SYNTHESIS IN NEURONAL DENDRITES: FUNCTION IN SYNAPTIC PLASTICITY?

Summary

The article summarizes the most meaningful studies which have provided evidence that protein synthesis in the neuron can occur not only in cell perikarya but also locally in dendrites. Dendrites contain the complete machinery required to synthesize proteins. Until now 12 different mRNAs coding the proteins involved in neurotransmission and modulation of synaptic activity have been identified in dendrites. Among these molecules is a BDNF

neurotrophic factor which is a strong regulator of neuronal activity. It is postulated that the phenomenon of local synthesis provides the mechanism of fast changes in the strength of neuronal connections and is the molecular background of synaptic plasticity. Local protein synthesis points to some autonomy of dendrites which makes them "the brains of the neurons" (Jim Eberwine).