

THE TWO MAJOR PROTEIN ISOFORMS OF ANKYRIN 2 ARE DIFFERENTIALLY LOCALIZED IN *DROSOPHILA* NEURONS

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In highly polarized cells, such as epithelial and neuronal cells, ankyrin-type proteins are the major molecules that link the cortical actin-spectrin-based membrane cytoskeleton to the plasma membrane. In *Drosophila* one of the two ankyrin genes, *Dank2*, is exclusively expressed in neuronal cells, whereas the other ankyrin gene (*ank1*) is ubiquitously expressed throughout development [1]. Similar to ankyrin genes in other organisms, the *Dank2* gene generates two major ankyrin protein isoforms by differential splicing. The smaller *Dank2* transcript contains an open reading frame of 1159 amino acid residues, whereas the larger *Dank2* transcripts encode polypeptides of 2386 to 2465 amino acid residues. The large *Dank2* transcripts differ from each other by the inclusion or the exclusion of 3 small introns at the 3' end of the open reading frame, thereby generating 4 different large *Dank2* protein isoforms with unique carboxytermini.

Here we report that in *Drosophila* neurons the short *Dank2* protein isoform is restricted to neuronal cell bodies and is excluded from axons. In contrast, the long *Dank2* isoforms are specifically localized to axonal extensions. Thus in neurons, the long and short *Dank2* protein isoforms are localized to complementary cellular subdomains. This finding demonstrates that *in vivo* the composition of the cortical cytoskeleton is highly polarized in neuronal cells. We also show that this polarization, once it is established in the embryo, persists in subsequent stages of *Drosophila* nervous system development.

REFERENCE

1. Bouley, M., Tian, M.-Z., Paisley, K., Chen, Y.-S., Malhotra, J.D. and Hortsch, M. The L1-type Cell Adhesion Molecule Neuroglian Influences the Stability of Neural Ankyrin in the Developing *Drosophila* Embryonic Nervous System, but not its Axonal Localization. **J. Neurosci.** 20 (2000) 4515-4523.