

Drebrin-like protein DBN-1 is a sarcomere component that stabilizes actin filaments during muscle contraction

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Abstract:

Locomotion of *C. elegans* requires coordinated, efficient transmission of forces generated on the molecular scale by myosin and actin filaments in myocytes (between dense bodies and the hypodermis attached cuticle enveloping body wall muscles). The complex organization of the acto-myosin scaffold with its accessory proteins provides a fine-tuned machinery regulated by effectors that guarantees that sarcomere units undergo controlled, reversible cycles of contraction and relaxation. We identify and functionally characterize a *Caenorhabditis elegans* drebrin-like protein DBN-1 as a novel constituent of the muscle contraction machinery. In vitro, DBN-1 exhibits actin filament binding and bundling activity. In vivo, DBN-1 is expressed in body wall muscles of *C. elegans*. Our data show that DBN-1 organizes the muscle contractile apparatus maintaining the spatial relationship between actin-binding proteins such as α -actinin, tropomyosin and ADF/cofilin and possibly strengthening actin filaments by bundling.

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