PublisherInfo		
PublisherName	:	BioMed Central
PublisherLocation	:	London
PublisherImprintName	:	BioMed Central

Anchoring nuclei to the cytoskeleton

ArticleInfo		
ArticleID	:	4607
ArticleDOI	:	10.1186/gb-spotlight-20021011-01
ArticleCitationID	:	spotlight-20021011-01
ArticleSequenceNumber	:	273
ArticleCategory	:	Research news
ArticleFirstPage	:	1
ArticleLastPage	:	2
ArticleHistory	:	RegistrationDate : 2002–10–11 OnlineDate : 2002–10–11
ArticleCopyright	:	BioMed Central Ltd2002
ArticleGrants	:	
ArticleContext	:	130593311

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The adult *Caenorhabditis elegans* worm is covered by four large syncytial hypodermal cells that contain over 100 nuclei evenly spaced throughout each syncytium. Mutations in the *anc-1* or *unc-84* genes cause the Anc phenotype, in which these nuclei either float freely within the cytoplasm or are grouped together. In the October 11 Science, Daniel Starr and Min Han describe characterization of the ANC-1 protein (*Science* 2002, **298:**406-409). They cloned the *anc-1* gene, which encodes a large protein containing mostly predicted coiled regions. The carboxyl terminus contains a 'KASH' domain, which is found in the *Drosophila* Klarsicht protein and mammalian Syne ('synaptic nuclei expressed') proteins. The amino terminus contains an actin-binding domain similar to that found in the dystrophin-related protein Msp-300 and in Syne. Immunostaining with antibodies against ANC-1 revealed that localization in the nuclear periphery is disrupted in unc-84 mutants. Overexpression of a carboxy-terminal fragment of ANC-1 caused a nuclear anchorage defect, while overexpression of high levels of the ANC-1 amino terminus caused a weak Anc phenotype (and *Anc*-1 mutations also affected mitochondrial position). The ANC-1 and UNC-84 proteins thus provide a molecular link between nuclei and the actin cytoskeleton.

References

1. Post-embryonic cell lineages of the nematode, *Caenorhabditis elegans*

2. *Science*, [http://www.sciencemag.org]