

The novel functions of the cytochrome b_{561} protein family in *Caenorhabditis elegans*

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Cytochrome b_{561} (b561) protein family functions as the transmembrane electron transporter. Some family members are studied in detail for their physiological functions but most of them are not well understood. In the present study, we focused on a nematode *C. elegans* as the most suitable model. *C. elegans* contains 7 b561 homologs (Ceb561-1 to 7) but their functions are not studied. We chose Ceb561-1 and 2 as the first targets. Both of them were expressed in *P. pastoris* cells successfully. It could be reduced by ascorbate (AsA) efficiently and showed characteristic visible absorption spectra as a member of the b561 family. The whole-mount immunostaining indicate that Ceb561-1 was expressed in muscle tissues. Ceb561-1 knockdown worms indicated growth retardation and impaired egg-laying ability. In this regard, Ceb561-1 protein may have important functions in muscles by utilizing AsA, and may be related to the biosynthesis of collagen. On the other hand, Ceb561-2 was found to be expressed in intestines. Stopped-flow analysis of Ceb561-2 indicated rapid electron accepting ability from AsA at neutral pH. These results suggested that Ceb561-2 functions as the ferric reductase. We are continuing investigation on the functions of other b561 family members in *C. elegans*.