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In Vitro Recombinant Expression of Novel Protective Protein Highly Accumulated in Dry State in an Anhydrobiotic Insect

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Abstract

© 2016, Springer Science+Business Media New York.Recent intensive studies showed that ability of several groups of organisms to withstand complete desiccation (anhydrobiosis state) is largely based on the activity of several groups of key proteins, including representatives of intrinsically disordered ones. In the largest known anhydrobiotic animal, the sleeping chironomid, both proteomic and genome-wide/targeted mRNA expression analysis suggest that several groups of the novel proteins greatly contribute to the formation of the molecular shield. Among them, 114 aa-long protein, dryporin. Being one of the most abundant in the desiccated larvae on protein level and showing one of the highest expression on mRNA level, this protein shows lack of the obvious homology with other known proteins. In this study, we successfully produced recombinant dryporin protein using BY-2 cell free lysate and showed the evidence of post-translational modification of the protein in the anhydrobiotic larvae.

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Keywords

Anhydrobiosis—protective proteins, In vitro translation, The sleeping chironomid

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