

Towards the Structure of the BchI Hexameric Complex of Magnesium Chelatase

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The insertion of Mg²⁺ into protoporphyrin IX is catalyzed by the enzyme magnesium chelatase and represents the first committed step in the chlorophyll and bacteriochlorophyll biosynthetic pathways. Magnesium chelatase, in organisms that synthesize bacteriochlorophyll, consists of three subunits, known as BchI, BchD and BchH. The structure of the monomeric BchI has been determined by X-Ray crystallography and it belongs to the chaperone-like, ATPase associated with a variety of cellular activities, (AAA) family of ATPases. Examination by electron microscopy of BchI solutions in the presence of ATP demonstrated that BchI, like other AAA proteins, forms oligomeric ring structures, [1]. The ATP hydrolysis is proposed to trigger major conformational changes in the hexamer, as has been shown for other AAA modules, [2]. Thus, it is crucial to fixate the complex in one single conformational state using non-hydrolysable substrates to create a homogenous environment. Needle shaped protein crystals have been obtained in different conditions. Ongoing optimization of crystallization conditions will hopefully give single crystals suitable for X-ray diffraction.

[1] Fodje M. N., Hansson A., Hansson M., Olsen J. G., Gough S., Willows R. D., Al-Karadaghi S., *J. Mol. Biol.*, 2002, **311**, 111-122. [2] Rouiller I., DeLaBarre B., May A.P., Weis W.I., Brunger A.T., Milligan R.A., Wilson-Kubalek E.M., *Nat. Struct. Biol.*, 2002, **9**(12), 950-7.

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