Crystal Structure of Leucine Zipper Protein Hy5 Complexed with DNA

Toshiyuki Shimizu[a], Hiroki Adegawa[a], Hiroshi Hashimoto[a], Matsui Minami[b], Mamoru Sato[a], [a]*Graduate School of Integrated Science, Yokohama City University of Japan,* [b]*Plant Functional Genomics Research Group, Genomic Sciences Center, RIKEN Yokohama Institute*. E-mail: shimizu@tsurumi.yokohama-cu.ac.jp

The basic leucine tipper (bZIP) transcription factor Long Hypocotyl 5 (HY5) is a positive regulator of photomorphogenesis, which acts downstream of the light receptor network and directly affects the transcription of light-induced genes [1]. HY5 activity is controlled by a key negative regulator, Constitutive Photomorphogenic 1 (COP1), an ubiquitin ligase that targets HY5 for degradation in dark-grown conditions. HY5 is a 168–amino acid protein representing a member of a class of basic leucine zipper (bZIP) DNA binding proteins. HY5 is involved in light regulation of transcriptional activity of the promoters containing the G-box (CACGTG). We also show Hy5 bind to the CRE-sequence (TGACGTCA).

To clarify DNA recognition mechanism of Hy5, we have tried to determine the structure of Hy5 complexed with DNA containing CRE-sequence with X-ray crystallographic analysis. Crystals suitable for analysis were obtained at 293 K by hanging drop vapor-diffusion method. The structure is determined with molecular replacement using the combined model of CREB-CRE and Jun-CRE complex. The DNA recognition mechanism will be discussed.

[1] Chattopadhyay S. , Ang L.H., Puente P., Deng X.W., Wei N., *Plant Cell*., 1998, **10**, 673.

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