

E201

Characteristics of the Genes of Blue Copper-Binding Protein II & III in *Arabidopsis thaliana*

Chang-Hoon Kim*, Young-Hoon Cho and Young-Nam Hong
Department of Biology, Seoul National University

We obtained partial clones encoding blue copper-binding protein(BCB) and nitrite reductase(NiR) in PCR reaction of genomic DNA by using degenerated primers for *nir* of higher plants. By using partial *bcb* as a probe, genomic DNA blot analysis in low stringent hybridization condition(55°C) showed that genes of *bcb* are multigene family consisting of at least 3 copies. Searching for other clones like *bcb* in the database of expressed sequence tags in National Center for Biotechnology Information, it was confirmed that there are at least 5 kinds of clones in *Arabidopsis thaliana*. In these, further sequence analysis of two clones obtained from Arabidopsis Biological Resource Center showed that there are copper-binding site and amino acid sequence having homology on *bcb*. These clones were named *bcbII*(U57320) and *bcbIII*(U65650), genes of copper-binding proteins with 200 aa and 221 aa respectively. *bcb* showed 50% homology with *bcbII*, 38% with *bcbIII* in terms of amino acid sequences. Especially, *bcbII* and *bcbIII* had 57% homology. We isolated genomic clones of *bcbII* and *bcbIII* showing 2 exons and 1 intron. It is conceivable that *bcb II* and *bcb III* with transit peptide move into organelles.

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Activation of Nitrite Reductase by Light & Nitrate in Hot Pepper (*Capsicum annum* L.) Seedling

Young-Hoon Cho*, Chang-Hoon Kim and Young-Nam Hong
Department of Biology, Seoul National University

Two Key enzymes of nitrate(NO_3^-) assimilation, nitrate reductase (NR) and nitrite (NO_2^-) reductase (NIR) are regulated by environmental and metabolic conditions. In plant the major factors of activation of these enzymes are light and nitrate. In order to study nitrate assimilation in hot pepper, we isolated a *nir* partial clone in hot pepper by degenerative polymerase chain reaction. DNA fragment of 581-bp was obtained and sequenced. The deduced amino acid sequence was highly homologous with that for other plants (PCC7942, kidneybean, corn, tobacco, spinach). Genomic DNA blot analysis revealed that NIR is encoded by a small multigene family and this result supported by NIR-electrophoretic assay showed that NIR have more than two isoforms. By sodium dithionite assay, light and nitrate dependent activation of this enzyme was tested. It is under investigation whether light and nitrate affects *nir* transcripts level by through the RNA blotting assay.