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Molecular Characterization of *Hyp-1* gene in Genus *Hypericum* in Korea

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A major gene termed *Hyp-1* encoding for hypericin (HyH) biosynthesis was cloned and characterized from Genus *Hypericum* in Korea. Hypericin, a photosensitive and red-colored naphthodianthrone, has been reported as the bioactive compound responsible for reverting the depression symptoms. *Hyp-1* catalyzes an initial condensation reaction between emodin anthrone followed by dehydration to form emodin dianthrone. Emodin diathrone may subsequently undergo phenolic oxidation to prothohypericin, which in turn yields HyH. The full sequence of *Hyp-1* is about 782 nucleotides in length with an open reading frame of 477 nucleotides coding for a protein of 159 amino acids, with 99.9% homology to that of *H. erectum* and 99.7% of *H. ascyron* in Korea. *H. erectum* was similar to *H. perforatum* rather than *H. ascyron*. *H. erectum* at 500 m in Mt. Giri is closed related to that of 230 m in Mt. Byeongpung rather than that of 1300 m in Mt. Giri. *Hyp-1* gene is abundantly expressed in the bud.