**Diurnal expression of the *Lhcb* gene in the moss *Physcomitrella patens*.**

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Many researchers reported that *Lhcb* genes, encoding chlorophyll-binding proteins, from various higher plants exhibited robust oscillations with daily intervals. These rhythms are controlled by the circadian clock, a self-sustained oscillator with a period of about one day, and persist even in constant conditions such as continuous light (LL).

We investigated whether or not the *Lhcb* genes of the moss *P. patens* are also under the control of the circadian clock. First, we isolated two *Lhcb* genes, tentatively named as *PpLhcb1* and *PpLhcb4*, by a screen of a *P. patens* genomic DNA library. The two genes clustered in a branch very close to, but distinct from, the *Lhcb1* and *Lhcb2* groups in higher plants in the phylogenetic tree constructed with *Lhcb* sequences from several plant species. Northern blotting analyses using the *Lhc*b4 coding region as a probe revealed the expression pattern of *Lhcb* genes under light-dark cycle (LD), LL and continuous dark (DD) conditions. We observed very robust oscillations and damping oscillations with daily intervals under LD and DD conditions, respectively, whereas we could not observe rhythmic expression under LL condition. Some characteristics of the rhythms in LD and DD conditions suggested that the moss *Lhcb* genes are also under the control of the circadian clock. We fused the putative promoter region of *Lhcb4* upstream of the firefly luciferase gene, and introduced this fusion DNA into the moss genome by the PEG-mediated transformation. The resulting transformants exhibited bioluminescence whose temporal profiles were consistent with the Northern data. We are now investigating light resetting properties of the damping oscillation of the *Lhcb4* gene in DD.