



Transcriptome survey of phototransduction and clock genes in marine bivalves

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ABSTRACT. Marine animals exhibit a variety of biological rhythms, such as solar and lunar-related cycles; however, our current molecular understanding of biological rhythms in marine animals is quite limited. Identifying and understanding the expression patterns of clock genes from available transcriptomes will help elucidate biological rhythms in marine species. Here, we perform a comprehensive survey of phototransduction and circadian genes using the mantle transcriptome of the scallop *Patinopecten yessoensis* and compare the results with those from three other bivalves. The comparison reveals the presence of transcripts for most of the core members of the phototransduction and circadian networks seen in terrestrial model species in the four marine bivalves. Matches were found for all 37 queried genes, and the expressed transcripts from the deep sequencing data matched 8 key insect and mammalian circadian genes. This demonstrates the high level

of conservation of the timekeeping mechanism from terrestrial species to marine bivalves. The results provide a valuable gene resource for studies of “marine rhythms” and also further our understanding of the diversification and evolution of rhythms in marine species.

Key words: Transcriptome; Circadian clock; Lunar-related cycles; Circadian rhythm