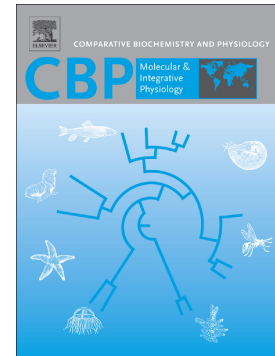


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Localization and expression of putative circadian clock transcripts in the brain of the nudibranch *Melibe leonina*

Victoria E. Duback¹, M. Sabrina Pankey¹, Rachel I. Thomas², Taylor L. Huyck², Izhar M. Mbarani², Kyle R. Bernier², Geoffrey M. Cook², Colleen A. O'Dowd¹, James M. Newcomb², Winsor H. Watson III¹

University of New Hampshire, Durham, New Hampshire¹
New England College, Henniker, New Hampshire²

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*corresponding author:

Dr. Winsor H. Watson III

Department of Biology, University of New Hampshire

Durham, NH 03824

Tel: 603-862-1629

win@unh.edu

Abstract

The nudibranch, *Melibe leonina*, expresses a circadian rhythm of locomotion, and we recently determined the sequences of multiple circadian clock transcripts that may play a role in controlling these daily patterns of behavior. In this study, we used these genomics data to help us: 1) identify putative clock neurons using fluorescent *in situ* hybridization (FISH); and 2) determine if there is a daily rhythm of expression of clock transcripts in the *M. leonina* brain, using quantitative PCR. FISH indicated the presence of the clock-related transcripts *clock*, *period*, and *photoreceptive* and *non-photoreceptive cryptochrome* (*pcry* and *npcry*, respectively) in two bilateral neurons in each cerebropleural ganglion and a group of < 10 neurons in the anterolateral region of each pedal ganglion. Double-label experiments confirmed colocalization of all four clock transcripts with each other. Quantitative PCR demonstrated that the genes *clock*, *period*, *pcry* and *npcry* exhibited significant differences in expression levels over 24 hrs. These data suggest that the putative circadian clock network in *M. leonina* consists of a small number of identifiable neurons that express circadian genes with a daily rhythm.

Declarations of interest

None

Keywords

Gastropod, circadian rhythm, cryptochrome, biological clock, nudibranch, clock genes

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