

Review

[Science](#), [Biology](#)



Article Review- "Independent Photoreceptive Circadian Clocks throughout *Drosophila*" The article reviews the expression of luciferase or green fluorescent protein from the promoter of the clock period in order to monitor the circadian clock in explanted abdominal tissues, head and thorax in transgenic *Drosophila* (Plautz et al., 1992). The observed photoreceptive properties of the explanted tissues indicate the role of unidentified photoreceptors in photic signal transduction of the clock.

The purpose of the study is to investigate the expression of genes instrumental to the functioning of the biological clock. The researchers sought to examine the activity of unidentified circadian photoreceptors in other organs other than the eyes. There is ample background information on the genes that contribute to the biological clock in *Drosophila*. These include the period (*per*) and timeless (*tim*) clock genes. In addition, *Drosophila* that lack photoreceptive organs have been observed to transmit light information to the clock (Plautz et al., 1993). This indicates the existence of unidentified circadian photoreceptors in the insect.

Each of these three segments exhibited rhythmic bioluminescence in light dark conditions. When the conditions were changed to constant darkness, a gradual decrease in amplitude was observed (Plautz et al., 1993). The cultures managed to reentrain to a new light dark cycle where the onset of light occurred 6 hours later than the free-running subjective dawn. The process of reentrainment happened in a cycle and the main bioluminescent peak declined 20 hours after lights-on. These findings show that other organs such as the legs, wings and testes in *Drosophila* express photoreceptors. After reviewing the article, the following research questions can be

formulated. First, expression of per gene in the tissues displaying photoreceptive activity needs to be investigated. Secondly, a comparison needs to be made on the expression of per and tim genes in the tissues displaying photoreceptive activity.

Work Cited

Plautz, Jeffrey, Maki Kaneko, Jeffrey Hall, and Steve Kay. "Independent photoreceptive circadian clocks throughout Drosophila." *Science Magazine*. 278(1997): 1632-1635. Print.