SCIENCE FOR THE BENEFIT OF HUMANITY

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# A Novel Nuclear Translocation Factor For Proteins Involved In Circadian Rhythms

RU# 303

## Technology Summary

Circadian rhythms are fluctuations in physiological and behavioral activities that occur over a period of 24 hours. They are generated by an endogenous timekeeping mechanism called the circadian clock. This clock controls many natural biological rhythms including heart rate, blood pressure, body temperature, hormone levels, pain threshold, and even the ability to fight against harmful invaders like bacteria and viruses. Therefore, understanding this biological clock will lead to better treatments for diseases affected by alterations in circadian rhythms such as diabetes, cardiovascular diseases, and sleep, mental and hormonal disorders.

It has been previously described that the *period* (PER) gene is an essential component of the circadian clock in *Drosophila melanogaster*. Our scientists have identified the *timeless* (TIM) gene as a second essential component of the circadian clock in *Drosophila*. The TIM protein interacts physically with PER and this protein complex then translocates into the nucleus. Together, TIM and PER control the expression of their own and other genes, which is cyclical. Our researchers have sequenced the TIM gene and produced both monoclonal and polyclonal antibodies against the TIM protein.

## Area of Application

- **Research tools.** Proteins, nucleic acids and antibodies may be used as research tools to study circadian rhythms.
- **Antibody production.**

## Stage of Development

Discovery

## Lead Inventor

Michael W. Young.

## Patent Information

US patent 5,885,831. (Issued on March, 23 1999)

## References

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- Vosshall LB, Price JL, Sehgal A, Saez L, Young MW. 1994. Block in nuclear localization of period protein by a second clock mutation, timeless. **Science**. Mar 18;263(5153):1606-9