

# Why living against the clock is a risky business

February 21 2013

---

Living against the clock—working late-night shifts or eating at inappropriate times, for example—can come with real health risks, metabolic syndrome, obesity, and diabetes among them. Now, researchers reporting in *Current Biology*, a Cell Press publication, on February 21 have new evidence to explain why it matters not just what mice (or by extension, people) eat, but also when they eat it.

Insulin action rises and falls according to a 24-hour, circadian rhythm, the researchers found. What's more, mice unable to keep the time for one reason or another get stuck in an insulin-resistant and obesity-prone mode.

"We used to think some things were so important that they must be kept constant," says Carl Johnson of Vanderbilt University. "But those metabolic set points are changing as a function of the time of day."

Johnson's team took careful measurements of insulin in mice at different hours to reveal a regular pattern. Normal mice become insulin resistant during the day, when the [nocturnal animals](#) are mostly sleeping. Mice made unable to keep the time based on a [genetic defect](#) or constant exposure to light lost that rhythm. They also gained more weight when fed on high-fat mouse chow.

That responses to insulin would vary over the course of a day makes sense, even if it isn't the way scientists or doctors have often thought about it.

"From the work of Claude Bernard in the 19th century, the concept of homeostasis as the maintenance of a constant internal environment is deeply ingrained in our thinking about how organisms work," the researchers write. But it's also wrong, Johnson argues, for the simple reason that an animal's environment follows an obvious daily rhythm too. Evolution will favor organisms that have an optimal response to that environment, which is rhythmic.

And so it is that [insulin action](#) and blood [sugar metabolism](#) are tied to the time of day and to the internal mechanisms that keep track of that time. It's a challenging reality for us humans, living as we do today in the comfort of our homes, where the lights come on at the flip of a switch and the food is plentiful.

"Mediterranean diets in which the main meal is eaten in the middle of the day are probably healthier," Johnson says. It's probably best to eat a light supper and avoid snacking after dinner.

Diets that only limit when people eat surely won't reverse the epidemic of obesity, he says, but they would probably help.

**More information:** *Current Biology*, Shi et al.: "Circadian disruption leads to insulin resistance and obesity."  
[dx.doi.org/10.1016/j.cub.2013.01.048](https://doi.org/10.1016/j.cub.2013.01.048)

Provided by Cell Press

Citation: Why living against the clock is a risky business (2013, February 21) retrieved 19 April 2024 from <https://medicalxpress.com/news/2013-02-clock-risky-business.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private

study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.