

Fat tissue shows a robust circadian rhythm in a dish

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In humans, glucose tolerance varies with time of day, but the mechanism responsible for the variation in insulin sensitivity throughout the day is unclear. In a recent study in *The Journal of the Federation of American Societies for Experimental Biology*, researchers from Brigham and Women's Hospital and the University of Murcia investigated whether human adipose (fat) tissue possesses its own circadian rhythm in insulin sensitivity that could contribute to this phenomenon.

Using samples of adipose tissue from both [visceral fat](#) and subcutaneous fat from 18 people who underwent [gastric bypass surgery](#), researchers found that subcutaneous fat has an intrinsic circadian rhythm in insulin sensitivity. Insulin sensitivity reached its maximum around noon, and was more than 50 percent higher than at midnight. Interestingly, the rhythm was not observed in visceral fat.

"Our study demonstrates that subcutaneous human fat tissue has an internal clock that is able to regulate insulin sensitivity even when outside of the body. This tissue rhythm matches well with what has been observed in humans overall when examining how people cope with a meal or sugar load," said Frank Scheer, PhD, of BWH's Division of Sleep Medicine.

"This cellular clock may contribute to the daily rhythm in [glucose tolerance](#) observed in humans," said Marta Garaulet, PhD, of the University of Murcia. "Our next steps are focused on whether or not we can influence the circadian clock intrinsic to this tissue and if that

influence will change [insulin sensitivity](#)."

More information: M. P. Carrasco-Benso et al. Human adipose tissue expresses intrinsic circadian rhythm in insulin sensitivity, *The FASEB Journal* (2016). [DOI: 10.1096/fj.201600269RR](https://doi.org/10.1096/fj.201600269RR)

Provided by Brigham and Women's Hospital

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