

# A NOBEL PRIZE IN MEDICINE FOR FINDING DNA LINK TO CIRCADIAN RHYTHM

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Biotech, healthcare, tech

How many people had their bets down on [circadian rhythm](#) for the Medicine/Physiology Nobel this year? Not many, I'd think, and that includes one of the actual laureates. The three winners are [Michael Rosbash](#) and [Jeffrey Hall](#) of Brandeis (a university that I can literally see outside the window of my train as I write this post!) and [Michael Young](#) of Rockefeller. When the committee called Rosbash, according to Stat, he [responded with](#) "You are kidding me."

That's not because it isn't a great discovery, but it's just one of the many "Nobel-able" ones out there that doesn't have as high a profile as (say) CRISPR gene editing, which is where a number of observers expected an award. (There's always time for them to give that one as the Chemistry prize on Wednesday, or of course to do no such thing and just sit on it for a few years in the way that Nobel committees do – we'll see!).

Circadian rhythm, the "internal clock" of humans and other organisms, is one of those topics that seems obvious for a few seconds, and then starts to get complicated. It's clear that we humans have a day/night wake/sleep cycle, but how does that work? You'd think, well, sure, it's the amount of daylight that we're responding to, but we still have similar behavior under artificial lighting, and dark, cloudy days don't seem to reset us, either. Experiments with both animals and human volunteers completely sealed off from daylight and able to set their own activities show that they also have sleep/wake cycles very close to 24 hours. Well, sure, then, you think, it's physical activity. But doing a hard day's work as opposed to lounging around doesn't seem to affect things as much as that guess would require. All right then, it's just duration: you can only be awake so long before going back to sleep, and you can only be asleep

so long before waking up. But that just raises the basic question again: how does your body know how long it's been awake? Or asleep?

Hall, Rosbash, and Young worked out different parts of that puzzle. As usual, it's rather hard to do that in humans, for a lot of excellent reasons, so a lot of the key discoveries were made in *Drosophila* (fruit flies). That illustrates another thing about "chronobiology" – evolutionarily, it goes way back. Organisms have been responding to the day/night cycle for an awfully long time, and the mechanisms behind it definitely show that ancient lineage. The first "clock mutants" in fruit flies were noted in the 1970s by [Ron Konopka](#) and [Seymour Benzer](#), both deceased and thus Nobel-ineligible. By deliberate exposure of flies to mutagens, they isolated some strains with lengthened schedules, some with shortened ones, and some where the rhythm had been disrupted completely. All of these mapped to the same gene, which was named *period*.



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