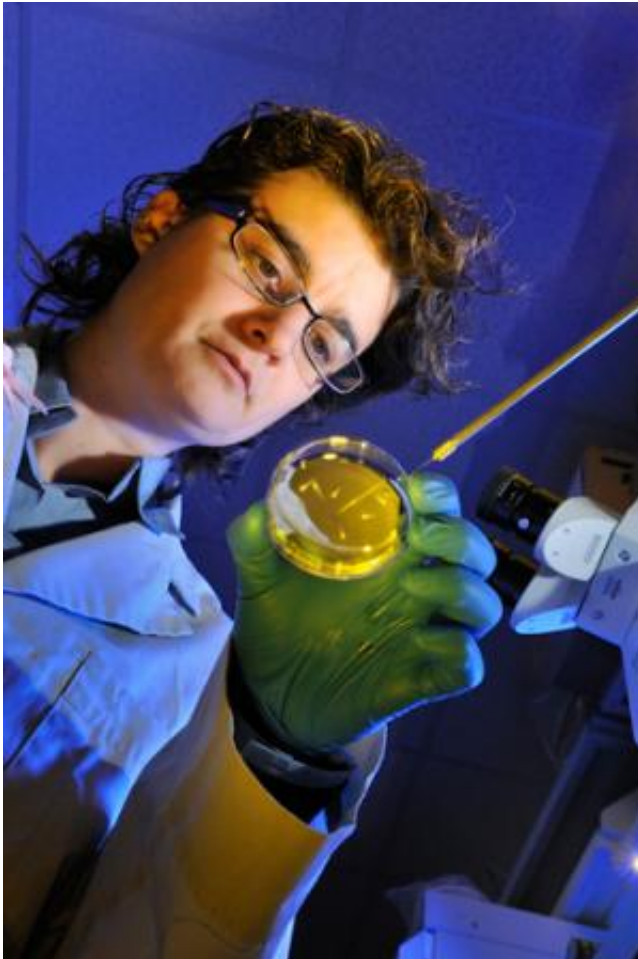


Arctic ground squirrel sheds light on circadian rhythms

November 11 2014, by Miles O'brien



Most often, people associate circadian rhythms with the symptoms of jet lag that occur after crossing several time zones. Circadian rhythms, which get their cues from light and darkness, can change sleep-wake cycles, hormone secretion, body temperature and other bodily functions. When disrupted, they can have important health consequences. In addition to the temporary fatigue and disorientation of jet lag, abnormal circadian rhythms have been linked to certain

sleep problems, depression, heart attacks, alcoholism, bipolar disorder and seasonal affective disorder. But do they raise the risk of cancer? Find out more in this discovery. Credit: Jim Stroup, University Relations, Virginia Tech

The Arctic ground squirrel has developed highly specialized adaptations to extreme environments, and it has a lot to teach us about circadian rhythms and biological clocks. This species maintains circadian rhythms throughout the Arctic summer, despite the almost ceaseless daylight during this period. The squirrels' body clocks have evolved to work just fine without the help of the day/night cycle, which is so important to other animals—like humans.

With support from the National Science Foundation (NSF), physiological ecologist Cory Williams of the University of Alaska, Anchorage, and a team of researchers traveled to the Toolik Field Station in northern Alaska to study the Arctic ground squirrel on its home turf. Part of the field research involves switching up light and temperature for the squirrels, essentially giving them a case of jet lag to gauge their reaction.

Back in Anchorage, environmental physiologist Loren Buck works with squirrels in his lab year-round. Buck says body clock disruptions are linked to many human ailments—seasonal affective disorder, obesity, cardiovascular disease, Alzheimer's, even cancer. And, those are good reasons to look into how an animal like the Arctic ground squirrel so finely tunes its body rhythms.

This research is being conducted in collaboration with a team of scientists at the University of Alaska, Fairbanks.

Provided by National Science Foundation

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