

# Can't focus? Maybe it's the wrong time of month

24 September 2010

Feeling a little sluggish and having trouble concentrating? Hormones might be to blame according to new research from Concordia University published in the journal *Brain and Cognition*. The study shows that high estrogen levels are associated with an inability to pay attention and learn - the first such paper to report how this impediment can be due to a direct effect of the hormone on mature brain structures.

"Although estrogen is known to play a significant role in learning and memory, there has been no clear consensus on its effect," says senior author Wayne Brake, an associate professor at Concordia's Center for Studies in Behavioural Neurobiology. "Our findings, using a well-established model of learning called latent inhibition, shows conclusively that high estrogen levels inhibit the cognitive ability in female rodents."

Human females have high estrogen levels while they are ovulating. These high levels have also been shown to interfere with women's ability to pay attention.

"The similarity between human studies and our findings suggest that we have a good model for human learning," says first author Matthew Quinlan, a former Concordia doctoral student now a lecturer at California State University San Bernadino. "[Rodent](#) research is invaluable to us. We can tease out the real contributors and their respective roles in these systems. It is much more difficult to conduct comparable experiments in humans."

## Latent inhibition: A model of learning

Latent inhibition is observed in many species and is believed to be the important part of learning, which enables individuals to interact successfully in their environment. It is a test of new [memory formation](#).

In the Brake protocol, rats received a pre-exposure phase during which they were repeatedly exposed to a tone, with no consequence. Once they became used to this tone and ignored it, the test dynamics changed and another stimulus was linked to the tone. Rats with low levels of estrogen quickly learned that the tone was associated with the new stimulus whereas those with higher levels of estrogen took longer to form this memory.

"We only observed this effect in adult female rats," says Brake. "This and our other findings indicate that estrogen directly effects the brain, perhaps by interfering with brain signaling molecules. Our study helps clear up the controversy about the effects of [estrogen](#), the next step is to look at how this occurs."

**More information:** Latent inhibition is affected by phase of estrous cycle in female rats, *Brain and Cognition*, [doi:10.1016/j.bandc.2010.08.003](https://doi.org/10.1016/j.bandc.2010.08.003)

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