

# Women's reproductive ability may be related to immune system status

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New research indicates that women's reproductive function may be tied to their immune status. Previous studies have found this association in human males, but not females.

The study appears in the *American Journal of Human Biology*.

An animal's energetic resources must be carefully allocated, said University of Illinois anthropology professor Kathryn Clancy, who led the new research. The body's first priority is maintenance, which includes tasks inherently related to survival, including [immune function](#), she said. Any leftover energy is then dedicated to reproduction. There is a balance between resource allocation to maintenance and reproductive efforts, and environmental stressors can lessen available resources, said Clancy, who co-directs the Laboratory for Evolutionary Endocrinology at Illinois.

The study participants were a group of healthy, premenopausal, rural Polish women who participate in traditional farming practices. The researchers collected the women's urine and [saliva samples](#) during the harvest season, when physical activity levels are at their peak. This physical work constrains available energetic resources. In previous studies, the highest levels of ovarian suppression occurred during the harvest season.

Researchers measured participants' salivary ovarian [hormone levels](#) daily over one [menstrual cycle](#). They also tested [urine samples](#) for levels of C-

reactive protein (CRP), a commonly used marker of inflammation.

"Depending on the other factors that you look at alongside it, CRP can tell you about immune function or it can tell you about psychosocial stress, because CRP has been correlated to both of those things in other populations," Clancy said.

The researchers observed a negative relationship between CRP and [progesterone](#) in the Polish women – in women with high CRP, progesterone was low. Further, the researchers found that estradiol and the age of first menstruation were the strongest predictors of [CRP levels](#).

Clancy noted that it is too early to tell whether these correlational relationships indicate a causal relationship in which inflammation suppresses ovarian hormones. However, she believes that there are two possible pathways that explain these results.

"One is that there is an internal mechanism, and this local inflammation drives higher levels of CRP, and that is what's correlating with the lower progesterone," she said. "The other possibility is that there is an external stressor like psychosocial or immune stress driving allocation to maintenance effort, which in turn is suppressing ovarian hormones."

Clancy believes that her research will help women "understand their bodies better."

"From an anthropological perspective, these trade-offs are really important because they help us understand the timing of different life events: Why does someone hit puberty when they do, why do they begin reproducing when they do, why do they space babies the way they do?" Clancy said.

"It's really interesting to see the interplay between a person's intentions

about when and why to have children, and then their own body's allocations to reproduction or not," Clancy said.

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