Research finds ovarian hormones play genes like a fiddle

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Kelly Klump, MSU Foundation Endowed Professor of Psychology, researches the biological, psychological and cultural factors behind eating disorders. Credit: G.L. Kohuth

A complex relationship between genes, hormones and social factors can lead to eating disorders in women. Kelly Klump, Michigan State

University eating disorder expert, has made monumental strides in deciphering how these factors interact. In her latest discovery, she has found that during the menstrual cycle, ovarian hormones act like a master conductor - they turn genetic risk on and off in the body.

"Our previous studies were some of the first to examine shifts in eating disorder risk across the menstrual cycle," said Klump, MSU Foundation Endowed Professor of Psychology. "We found that changes in ovarian hormones drive increases in binge eating and emotional eating across the cycle, which can be highly problematic for women, particularly since the cycle reoccurs monthly."

Klump has now zeroed in on how and why this phenomenon occurs. Like the conductor of a symphony, ovarian hormones act on genes within the brain and body to trigger physical changes in the body. For the first time, Klump's work has shown that these hormones can change genes that trigger psychological symptoms in women, such as emotional eating.

According to Klump, not only did rates of emotional eating change across the menstrual cycle, but the degree to which genes influenced eating patterns changed as well. This increase in genetic effects was remarkable considering that it occurs over the course of just days, not months or years.

"Following the same sample of women across the menstrual cycle, we found that the influence of genes on a binge eating behavior was up to four times higher in the high risk phases of the menstrual cycle than the low risk phases," said Klump.

The study, published in the journal *Psychological Medicine*, expands on Klump's previous research on genetic influences of eating disorders. Her lab was the first to discover that ovarian hormones have an effect on

genetic risk for psychiatric disorders in women. With this information, treatment providers can now pinpoint specific days within a patient's cycle where risk of these behaviors is highest, allowing them to provide more targeted treatment options.

These same types of genetic effects might be present for other disorders that occur more often in women, such as depression and anxiety.

"This may be the tip of the iceberg in terms of the role of ovarian hormones in genetic risk for mental illness," said Klump.

Provided by Michigan State University