

Matrimony inhibits Polo kinase

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Suspended animation is something we only associate with Sci Fi programs, but something remarkably similar actually occurs in unfertilized egg cells, in the ovaries of animals as different as humans and fruit flies. In an article published online this week in the open-access journal *PLoS Biology*, researchers from the Stowers Institute describe the two proteins that provide “Sleeping Beauty’s Kiss” to the long-dormant egg cells.

Unlike sperm, which are generated over the course of a man’s life, a girl is born with all the egg cells she will ever produce. The special cell division that creates sex cells (sperm and eggs) is called meiosis. During egg production, meiosis is paused part of the way through—a pause that, in humans, can last decades. Researchers in Scott Hawley’s lab at the Stowers Institute investigated the mechanism that brings eggs out of the paused state, using the fruit fly *Drosophila* as a model.

Youbin Xiang and colleagues identified two proteins crucial in controlling the pause in meiotic division. One protein, Polo kinase, is an enzyme that restarts the process of meiosis. However, it takes several days for enough Polo to build up. In the interim, a second protein called Matrimony binds to Polo and prevents it from working. Matrimony allows the egg cell to increase the amount of Polo until it is sufficient to force the cell through to the end of meiosis.

One question that arises from this work is just what destroys Matrimony at the crucial point. The paper suggests that this may be a threshold concentration of Polo, or else another, unidentified protein that targets

Matrimony. As Polo kinase is strongly expressed in many types of tumor cells, identifying a specific inhibitor for this protein, such as Matrimony, may aid the development of drugs for treating cancer.

The work by Xiang et al. may also have long-term implications for humans, as understanding the process by which eggs are matured and released could have profound implications for treating infertility.

Source: Public Library of Science

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