Sexual activity causes immune system changes that increase chances of conception

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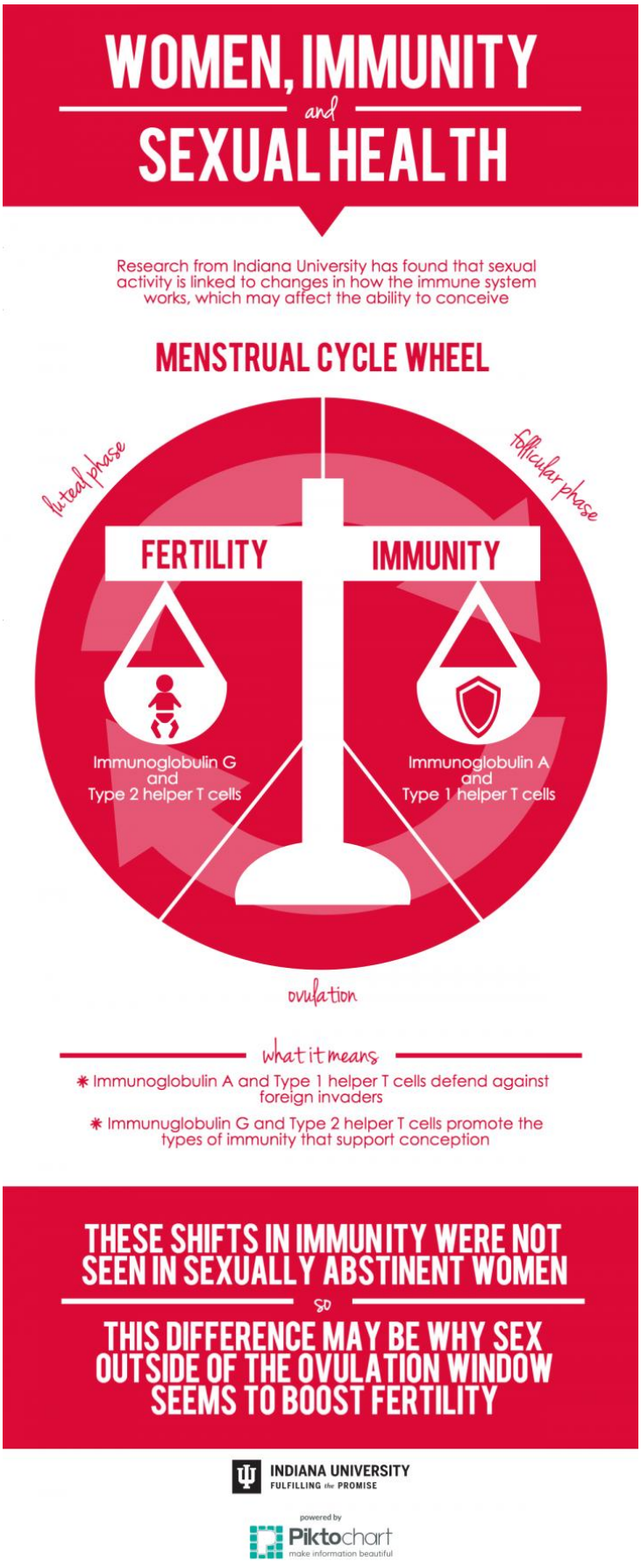
WOMEN, IMMUNITY
and
SEXUAL HEALTH
Research from Indiana University has found that sexual activity is linked to changes in how the immune system works, which may affect the ability to conceive
MENSTRUAL CYCLE WHEEL
luteal phase
follicular phase
FERTILITY
IMMUNITY
Immunoglobulin G and Type 2 helper T cells
Immunoglobulin A and Type 1 helper T cells
ovulation
what it means
Immunoglobulin A and Type 1 helper T cells defend against foreign invaders
Immunuglobulin G and Type 2 helper T cells promote the types of immunity that support conception
THESE SHIFTS IN IMMUNITY WERE NOT SEEN IN SEXUALLY ABSTINENT WOMEN
so
THIS DIFFERENCE MAY BE WHY SEX OUTSIDE OF THE OVULATION WINDOW SEEMS TO BOOST FERTILITY
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Women, Immunity and Sexual Health infographic. Designed by Milana Katic, IU Communications.

Research from Indiana University has found that sexual activity triggers physiological changes in the body that increase a woman's chances of getting pregnant, even outside the window of ovulation.

The results could eventually influence recommendations regarding how often to engage in sexual intercourse for couples trying to get pregnant. It could also potentially impact treatment for people with autoimmune disorders.

The conclusions are reported in papers recently published in the journal *Fertility and Sterility* and the journal *Physiology and Behavior*.

The lead author on both papers is Tierney Lorenz, a visiting research scientist at the Kinsey Institute. Julia R. Heiman, a professor in the Department of Psychological and Brain Sciences, and Gregory E. Demas, a professor in the Department of Biology, are also co-authors on the study.

All three researchers are also affiliated with the Center for Integrative Study of Animal Behavior at IU Bloomington. Heiman is also affiliated with the Kinsey Institute, where she previously served as director.

"It's a common recommendation that partners trying to have a baby should engage in regular intercourse to increase the woman's changes of getting pregnant—even during so-called 'non-fertile' periods—although it's unclear how this works," Lorenz said. "This research is the first to

show that the sexual activity may cause the body to promote types of immunity that support conception.

"It's a new answer to an old riddle: How does sex that doesn't happen during the fertile window still improve fertility?"

A few earlier studies show changes in immune function during pregnancy and after childbirth and changes in immunity across the menstrual cycle. But the IU research is the first to show that sexual activity plays a role in these changes with clear differences found in immune system regulation in women who are sexually active versus women who are sexually abstinent.

The results are based upon information from participants in the Kinsey Institute's WISH Study—Women, Immunity and Sexual Health—which collected data across the menstrual cycle in 30 healthy women, about half of whom were sexually active and half of whom were sexually abstinent. Heiman and Demas are co-investigators on the study.

In the first paper, Lorenz and colleagues report sexually active women experienced greater changes in helper T cells, and the proteins that T cells use to communicate. In the second paper, they report differences in antibody levels between the two groups.

Helper T cells manage the body's immune response in part by activating the cells that destroy invading microbes in the body. The antibodies—also known as immunoglobulins—are secreted by white blood cells and play an important role fighting off foreign invaders in the body.

"The female body needs to navigate a tricky dilemma," Lorenz said. "In order to protect itself, the body needs to defend against foreign invaders. But if it applies that logic to sperm or a fetus, then pregnancy can't

occur. The shifts in immunity that women experience may be a response to this problem."

There are several types of helper T cells and immunoglobulins. Type 1 helper T cells assist the body with defense against outside threats. Type 2 helper T cells help the body accept those aspects of pregnancy the body may otherwise interpret as "foreign invaders," such the presence of sperm or emerging embryo.

Similarly, immunoglobulin A antibodies—typically found in the mucous of the female reproductive tract—can interfere with the movement of sperm and other aspects of fertilization. Immunoglobulin G antibodies—typically found in the blood—fight disease without interfering with the uterus.

Lorenz and colleagues found significantly higher levels of type 2 helper T cells in sexually active, non-pregnant women during the luteal phase of the menstrual cycle, a period when the uterine lining thickens in preparation for pregnancy. Higher levels of type 1 helper t cells were found these same women during the follicular phase in the menstrual cycle, a period when the ovaries' follicles are maturing.

They also found sexually active women experienced similar changes in immunoglobulins, with higher levels of immunoglobulin G during the luteal phase and higher levels of immunoglobulin A during the follicular phase.

Neither shifts in immunity were observed in the sexually abstinent women.

"We're actually seeing the immune system responding to a social behavior: sexual activity," Lorenz said. "The sexually active women's immune systems were preparing in advance to the mere possibility of

pregnancy."

Both studies contribute to a growing body of evidence that the immune system isn't a passive system that waits to react to outside threats, but a highly proactive system that changes in response to external cues, such as the physical environment and social behavior.

The studies may also shed light on previous research that found unexplained fluctuations in immune response in women. A recognition that sexual activity can cause natural fluctuations in blood tests results could be useful to physicians treating patients with immune disorders, Lorenz said.

More information: *Fertility and Sterility* - www.sciencedirect.com/science/ … ii/S0015028215018853

Physiology and Behavior - www.sciencedirect.com/science/ … ii/S0031938415301153

Provided by Indiana University

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