Gene tweak may mean contraceptives for men

A new finding by scientists at the Centre for DNA Fingerprinting and Diagnostics (CDFD), Hyderabad could pave the way for the development of a new type of contraceptive.

Enzyme role

The study, conducted on mice, has found that the presence of an enzyme called IP6K1 played an important role in the formation of sperm cells in male mice.

Sperm formation is a multi-step process. In one of the stages, the nucleus of the cell has to condense and become elongated, a process that requires expression of two key sperm-specific proteins called TNP2 and PRM2. The study has found that IP6K1 is required to ensure that these two sperm proteins get expressed properly. When the researchers knocked out the gene that produces IP6K1, they discovered that sperm proteins were getting synthesised prematurely and, as a result, sperm failing to develop completely.

The leader of the study team, Dr. Rashna Bhandari, noted that the finding made possible the development of a new type of contraceptive, though it would take time, she cautioned.

“We can now think of inhibiting IP6K1 to make men infertile. However, another paper from a U.S. group has shown that an existing IP6K1 inhibitor does not cause male mouse infertility. It is probably because the inhibitor does not cross the blood-testis barrier. So, to develop a contraceptive using our new knowledge, we will first have to develop a new inhibitor of IP6K1, and then test it in mice to see if it causes male infertility.”

She also noted that there was a need to conduct more studies to understand the enzyme better. For instance, a Swedish group had, in 2007, shown that knocking out the IP6K1 gene reduced insulin secretion from the pancreas. “It is clear that we need to be extra cautious when we deal with this gene.”

Treating infertility

The finding, she said, could also be looked at from the point of view of treatment for male infertility. “So far, there has been no report of any infertility in human males because of a lack or dysfunction of [the] IP6K1 enzyme. But, it is conserved in men also. We can perhaps screen infertility patients to see whether there was any loss or mutation of the enzyme and if it was causing the infertility. If that was so, then it may be possible to cure their infertility by merely adding back the enzyme to their developing sperm.”

This study was conducted by a doctorate student, Aushaq Bashir Malla, who is under Dr. Bhandari’s guidance. The results have been published in the *Journal of Cell Science*. — India Science Wire

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