

Sperm help 'persuade' the female to accept pregnancy

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Sperm are generally viewed as having just one action in reproduction -- to fertilize the female's egg - but studies at the University of Adelaide are overturning that view. Credit: Karin Henseler

Sperm are generally viewed as having just one action in reproduction—to fertilize the female's egg—but studies at the University of Adelaide are overturning that view.

Published in Nature Research journal *Communications Biology*, new research shows that sperm also deliver signals directly to the female reproductive tissues to increase the chances of conception.

Robinson Research Institute's Professor Sarah Robertson, who led the project, said: "This research is the first to show that the female immune response is persuaded by signals in sperm to allow the [male partner](#) to fertilize her eggs and conceive a pregnancy.

"This overturns our current understanding of what sperm are capable of—they are not just carriers of genetic material, but also agents for convincing the female to invest reproductive resources with that male."

It has been known that proteins in seminal fluid modulate the female immune response at conception to encourage her body to accept the foreign embryo. Whether sperm affect this response has not been clear until now.

The team evaluated effects on global gene expression in the mouse uterus after mating with [males](#) with intact sperm, or vasectomized males. Intact males induced greater changes in female genes, particularly affecting immune response pathways.

The females that had contact with sperm produced stronger immune tolerance than those females mated with vasectomised males. By examining effects of sperm interactions with female cells in cell culture experiments, the researchers confirmed the sperm were directly responsible.

These new findings suggest that sperm health isn't only important for conceiving, but also has ongoing effects on the chances of a healthy baby. Factors like age, diet, weight, alcohol and smoking, and exposures to environmental chemicals can affect sperm quality in men and so might have greater consequences for pregnancy health than previously considered.

"Recognition that sperm influence reproductive events beyond simply fertilizing oocytes shows that sperm quality can have consequences for pregnancy health, beyond just conception," Professor Robertson said.

"Conditions like [recurrent miscarriage](#), preeclampsia, [preterm birth](#) and stillbirth are affected by the female's immune response in ways that the partner's [sperm](#) contribute to."

More information: John E. Schjenken et al, Sperm modulate uterine immune parameters relevant to embryo implantation and reproductive success in mice, *Communications Biology* (2021). [DOI: 10.1038/s42003-021-02038-9](#)

Provided by University of Adelaide

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