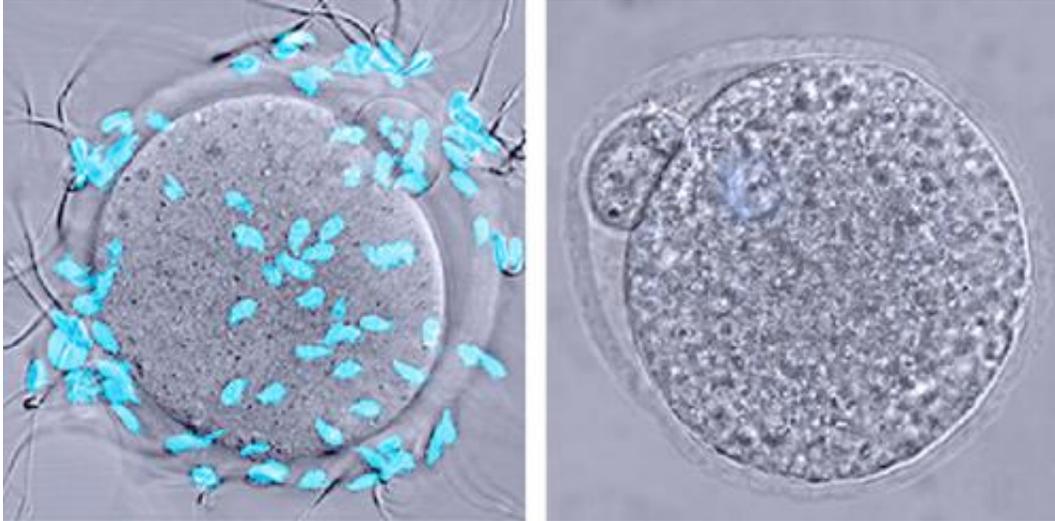


How sperm get into the zona

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Sperm (blue) latch onto a control egg (left) but can't bind to an egg lacking the glycoprotein ZP2 (right). Credit: Avella et al., 2014

Before it can fertilize an egg, a sperm has to bind to and bore through an outer egg layer known as the zona pellucida. Despite decades of research, some of the biological mechanisms behind this process remain unclear. A study in *The Journal of Cell Biology* now identifies the protein in the zona pellucida that sperm latch onto.

The zona pellucida protects the egg and the early embryo before implantation. Its structure seems simple—in humans it contains four kinds of glycoproteins, and in mice it only contains three. But researchers haven't been able to identify the sperm's binding partner in

the layer, although their suspicions have fallen on two of the glycoproteins, ZP2 and ZP3.

To find out more, Jurrien Dean and colleagues from the National Institute of Diabetes and Digestive and Kidney Diseases engineered mice to produce various combinations of human and mouse zona pellucida glycoproteins. Mouse sperm didn't bind to the zona pellucida if it was missing ZP2, and [female mice](#) lacking the protein were sterile. The researchers also found that sperm couldn't latch onto eggs if ZP2 was missing a key region at the beginning of the protein. This result jibes with a previous finding that fertilization triggers the release of an enzyme that severs ZP2 in this region, thus preventing additional sperm from attaching to the zona pellucida.

The team also tested the binding of [human sperm](#) to mouse eggs surrounded by a zona pellucida harboring human glycoproteins. Human [sperm](#) adhered to the mouse zona pellucida if it contained human ZP2 but not if it carried human ZP3, confirming the importance of ZP2.

More information: Avella, M.A., et al. 2014. J. Cell Biol. [DOI: 10.1083/jcb.201404025](#)

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