

Egg meets sperm: The female side of the story

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Researchers at the Swedish medical university Karolinska Institutet have been able to describe the 3D structure of a complete egg receptor that binds sperm at the beginning of fertilization. The results, published in the journal *Cell*, will lead to better understanding of infertility and may enable entirely new types of contraceptives.

For centuries, the imagination of people has been grasped by the encounter of gametes – egg and sperm-, whose union gives rise to a new individual. At the beginning of conception, [sperm](#) binds to proteins in the extracellular coat of the egg, called zona pellucida (ZP). But the molecular details of this fundamental biological event have so far remained obscure.

Luca Jovine's research team at Karolinska Institutet has now managed to determine the three-dimensional structure of the receptor molecule that binds sperm, called ZP3 (see press photos). The detailed structural information, based on data collected at the European Synchrotron Radiation Facility (ESRF), makes it possible to begin exploring at the molecular level how the egg interacts with sperm at fertilization.

The study suggests which parts of the receptor are likely to be directly contacted by sperm, and provides new insights into how the sperm receptor is assembled and secreted from the egg. The findings have important implications for human reproductive medicine, as they may explain how mutations in the sperm receptor gene could cause [infertility](#). The research could also potentially lead to the design of non-hormonal

contraceptives specifically targeting egg-sperm interaction.

"The results give a remarkable picture of the female side of fertilization", says Luca Jovine, who has led the study. "But this is, of course, only half of the story. The next step will be to tackle the corresponding molecules on sperm that allow it to bind to the egg."

More information: "Insights into Egg Coat Assembly and Egg-Sperm Interaction from the X-Ray Structure of Full-Length ZP3", Ling Han, Magnus Monné, Hiroki Okumura, Thomas Schwend, Amy L. Cherry, David Flot, Tsukasa Matsuda & Luca Jovine, *Cell*, 21 October 2010.

Provided by Karolinska Institutet

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