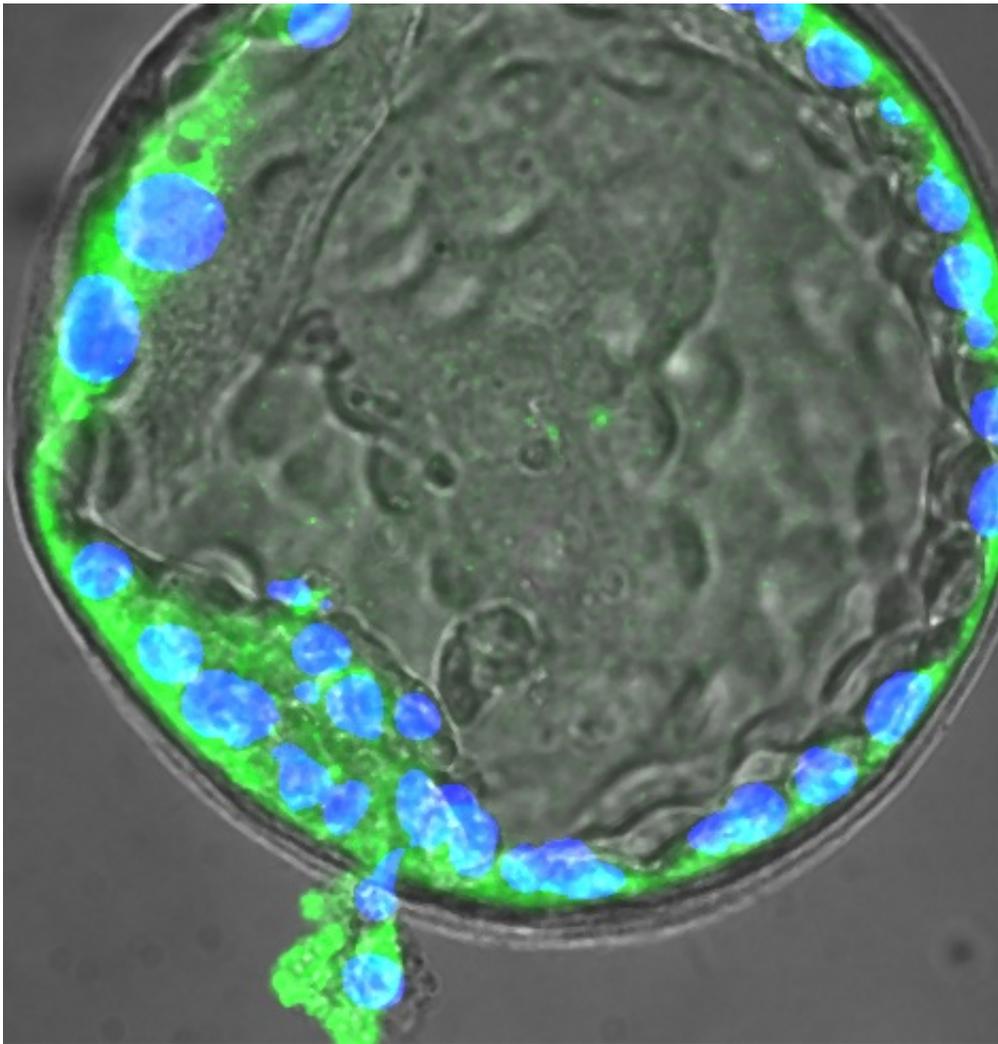


# The 'entrance exam' that is key to a successful pregnancy

February 6 2014

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This is an expression of trypsinogen activating enterokinase (green) in an implantation competent hatching human blastocyst on day six of development. Credit: Scarlet Salter & Anatoly Shmygol

Researchers have discovered how an 'entrance exam' set by the womb determines if the implantation of an embryo is successful; potentially a milestone for advances in pregnancy treatments.

The new study, led by Warwick Medical School and University Hospitals Coventry and Warwickshire NHS Trust, sheds light on how the lining of the womb analyses individual embryos and thus decides whether or not to support further development.

Before implantation, human embryos are genetically very diverse. Some embryos will contain no normal cells at all while others contain a mixture of normal and [abnormal cells](#). Hence, no two human embryos are the same at this early stage of development.

The article, published today in *Scientific Reports*, shows that high quality [human embryos](#) secrete a chemical, trypsin, which renders the lining of the womb supportive of implantation. This chemical signal is deregulated in low quality embryos and causes an alarm response in the womb, which leads to either rescue or elimination of the embryo.

Professor Jan Brosens explained, "This is important, because if the lining of the womb is not well prepared for pregnancy you may find that abnormal embryos will implant or high quality [embryos](#) will not be supported. Both scenarios can lead to pregnancy loss or even late [pregnancy complications](#), such as foetal growth restriction or preterm birth."

"Speaking in terms of an entrance exam; a poorly prepared womb will either make the test too rigorous or too lax – decreasing the chances of a successful pregnancy."

Approximately 15% of clinically recognised pregnancies miscarry, attributed to the invasive nature of the human embryo and prevalence of

chromosomal errors.

Professor Siobhan Quenby said, "This work adds to a growing body of evidence that assessment and optimisation of the lining of the womb may be the only effective way in preventing infertility and [pregnancy complications](#)."

The team, who were supported by researchers at the Universities of Southampton and Utrecht, believe that the news could prove vital to improving the options available to couples going through IVF, as implant failure remains the primary cause of unsuccessful treatment.

Professor Brosens added, "What we're looking at now is how to alter the lining of the [womb](#) so it can set this entrance exam at the right level and prevent implantation failure and miscarriages."

**More information:** Paper: [DOI: 10.1038/srep03894](https://doi.org/10.1038/srep03894)

Provided by University of Warwick

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